READINGS ON REPORT OF

THE RAILWAY ACCIDENTS ENQUIRY COMMITTEE, 1978

(SHRI S. M. SIKRI COMMITTEE REPORT, 1978)

PART I

COMPILED AND COMMENTED BY

Hari Shankar Verma, IRTS

Director General, IRITM



भारतीय रेल परिवहन प्रबंधन संस्थान

INDIAN RAILWAYS INSTITUTE OF TRANSPORT MANAGEMENT

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INDIAN RAILWAYS INSTITUTE OF TRANSPORT MANAGEMENT

(Hardoi By-Pass Road, P.O. Manak Nagar, LUCKNOW-226011, Uttar Pradesh, India.)

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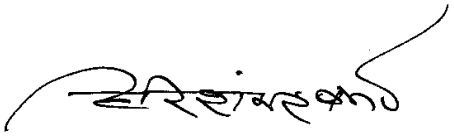
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Hari Shankar Verma, IRTS
Director General, IRITM
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(popularly known as Shri S.M. Sikri Committee)
as reading material at IRITM

हरि शंकर वर्मा
भारतीय रेल यातायात सेवा
महानिदेशक

Hari Shankar Verma
Indian Railway Traffic Service
Director General

सत्यमेव जयते

वयं राष्ट्रे जागृयाम

PREFACE

Safety is integral part of railway operation. Since laying of first line of railway track, the Indian Railways is always in total commitment to provide safe, efficient, and economical rail transport in country. If any accident happens on railway system, it put a question mark on safe railway working to a common man, but it also majorly affects the moral and confidence among railwaymen. The management and staff are always working hard and in thought process to improve the safety in railways.

The training of railway staff and officers is greatly consisting of safety rules. There is no discipline in railways, where safety in rail transportation and maintenance is not taught. At Indian Railways Institute of Transport Management (IRITM), we conduct regular classes to the officers and senior supervisors about the safety and encourage the trainee officers to read and learn the material available in the library about safety.

The primary source of learning in safety are General & Subsidiary Rules (G&SR), several codes and manual, accident reports given by commissioners of railway safety and reports of past Railways Accident Enquiry Committee. Most of the literature is available with the

library but Accident Enquiry Reports are not available in physical form and there is no analysis of these reports in condensed form.

It is not possible by everyone to go through these reports in various digital platforms and read them. Some of the reports are also not available digitally and most of them are not in readable format. Secondly, the Accident Enquiry Reports are also having historical importance to learn from our past and not to repeat the same mistakes in future.

The recommendations given by various Safety Enquiries Committees are not subject to be agreed by Railway Administration at that time and carry immense value for further study and improvement in our working. Most of the reports are prepared by the best of mind during that time and worth for reading. The railway is dynamic organization which keep changing its technology over the time with progress of technology, but the lesson learned about the safety remains the same therefore it is always needed to learn the things from past.

In order to prepare reading materials to the probationary officers and in-service officers, I have read most of the reports and strongly feel that all railway officers who are working with the safety and also the officers who are holding the administrative post like Additional Divisional Railway Manager (ADRM), Divisional Railway Managers (DRMs), Principal Head of the Department (PHODs), Principal Chief Safety Officers (PCSO) of the Zonal Railways, Additional General Managers (AGMs), General Managers (GMs) and officers in Railway Board, who are in policy making must read these reports.

As a mission mode, IRITM is compiling and printing all Accident Enquiry Reports in book form for easy reading and also put digital format of the same in IRITM website to encourage and facilitate about reading of these reports. These reports would also help the researcher and policy maker to draw the policies for making Indian Railways as one of the safe Railway systems in the world.

So far Indian Railways had constituted six safety review committees since independence. The purpose of constitution of these safety review committee was to study in deep about the causes leading to railway accident and how to strengthen rail safety. The list of committees which had been formed by Ministry of Railway is as under:

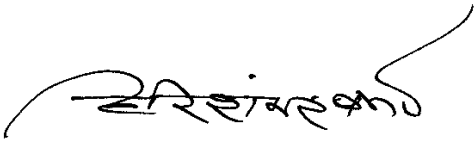
1. The Railway Accidents Enquiry Committee, 1954 **(Shahnawaz Committee 1954)**
2. The Railway Accidents Committee, 1962 **(Kunzru Committee1962)**
3. The Railway Accidents Inquiry Committee, 1968 **(Wanchoo Committee 1968)**
4. The Railway Accidents Enquiry Committee, 1978 **(The Sikri Committee 1978)**
5. The Railway Safety Review Committee **(The Khanna Committee 1998)**
6. High-Level Safety Review Committee 2012 **(Kakodkar Committee)**

High-Level Safety Review Committee, 2012 is the latest committee chaired by Dr. Anil Kakodkar. This committee is most important as it was constituted with

scientists and technocrats, who were the pioneers in their respective fields while previous committees were headed by retired supreme court judges except Shahnawaz and Kunzru Committee who were headed by parliamentarians and law makers.

While, readings of these reports, one can visit some part of history of Indian Railways and appreciate the circumstances just after our country got independence. These reports are full of events and anecdotes which remind us of things that have not changed even after passage of time. I personally feel that readers will find in them a good read.

I would like to put on record the hard work done by Mr. Subhash Sonkar and Mr. Rohit Yadav for formatting, proofreading, and converting it into printable format. I am also grateful to Shri Rajesh Kumar, IRTS, Sr. Professor Administration and Miss Krishna Tiwari, IRTS, Professor Administration and OSD to Undersigned for getting it published.



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Lucknow, UP, India.
Sunday, 05.09.2024, Teacher's Day.

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INTRODUCTION, BACKGROUND,
PROFILES OF CHAIRMAN AND MEMBERS,
AND ANALYSIS OF RECOMMENDATIONS OF

THE RAILWAY ACCIDENTS ENQUIRY COMMITTEE, 1978

INTRODUCTION, BACKGROUND, PROFILES OF CHAIRMAN AND MEMBERS, AND ANALYSIS OF RECOMMENDATIONS OF THE RAILWAY ACCIDENTS ENQUIRY COMMITTEE, 1978 (THE SIKRI COMMITTEE 1978)

I

The later part of the second half of 1977 saw two serious railway accidents in quick succession, involving heavy casualties and damage to railway property. The first was the collision between Howrah-Amritsar Deluxe Express and a goods train at Naini station on Mughal Sarai-Allahabad broad gauge section of the Northern Railway on October 10, 1977, and the second was the derailment of Ahmedabad-Delhi Mail between Ajarka and Bawal stations on Bandikui-Rewari meter gauge section of the Western Railway on November 11, 1977. These accidents had greatly agitated the public and deep concern was voiced in the Parliament and the Press. It was against this background that the Minister of Railways, Prof. Madhu Dandavate, while making a statement in the Rajya Sabha on December 19, 1977, announced the Government's decision to constitute a committee to go into the whole question of accidents. Subsequently, the following announcement was made by the Government of India through their Notification No. ERBI/77/21/86 dated January 3, 1978:

"Having regard to the views expressed by the Members of Parliament and others on the recent rail accidents, the Minister of

Railways announced in Parliament on December 19, 1977, the Government's decision to appoint a High-Power Accidents Enquiry Committee to go into the whole question of accidents.

The constitution of the Committee will be as follows: —

Chairman

1. Shri S. M. Sikri, former Chief Justice of Supreme Court of India.

Members

2. Dr. Murli Manohar Joshi, Member of Parliament (Lok Sabha).
3. Shri Khurshid Alam Khan, Member of Parliament (Rajya Sabha)
4. Shri Bagaram Tulpule, former General Manager, Durgapur Steel Plant and ex-Chairman, National Safety Council.
5. Shri P. Sahai. Ex-Member Railway Board.
6. Shri C.S. Parameswaran, Ex-General Manager, Railways.
7. Shri Arya Bhushan, Ex-Commissioner of Railway Safety.

Secretary

8. Shri V.K. Thapar, Joint Director (Safety), Railway Board.

Terms of Reference

The terms of reference of the Committee will be as Under. —

1. To review the position of accidents on the Indian Railways since the appointment of the Railway Accidents Inquiry Committee, 1968 and to review the implementation of their recommendations; and
2. To examine the adequacy of the existing organisation, equipment and practices for ensuring safe running of trains on the Indian Railways, and to suggest measures for prevention of accidents.

The Committee will submit its report within six months from the date it starts functioning.

(Sd.) B. MOHANTY,
Secretary, Railway Board
And Ex-Officio Jt. Secretary to the Govt. of India."

2. After completing the Preliminaries and staffing of the Secretariat, the Railway Accidents Enquiry Committee-1978 (hereinafter referred to as the Committee) held their first meeting on March 27, 1978, to chalk out their course of action. Discussions were also held with the Minister of Railways, the Minister of State for Railways and the Chairman and Members of the Railway Board.

   To advise the Committee on signal and tele-communication matters, the Government appointed Shri S. M. Gowri Shankar, Ex-Chief Administrative Officer, Railways and former Director, Signal and Telecommunications, Railway Board, as Consultant to the Committee.
   Shri V. K. Thapar worked as Secretary November 25, 1978, and, on his proceeding abroad for training tinder the United Nations Development Programme, Shri R. S. Soin, Joint Director, Civil Engineering, (Track), Railway Board, took over as Secretary of the Committee from December 2, 1978.
   Keeping in view the wide scope of investigations which have been entrusted to the Committee, the Government have extended its tenure Up to September 30, 1979.
3. The appointment of the Committee was given wide publicity through public notices in all important English and Hindi newspapers and also one leading newspaper commanding wide circulation in regional languages. A comprehensive questionnaire was issued to the Railway Administrations, the Commission of Railway Safety, the two recognized trade union Federations, the Federation of Railway Officers Associations and the Railway Service Commissions, soliciting information and their views on specific issues of railway working which have a bearing on the safe running of trains. Communications were also addressed to retired Chairmen/Members of the Railway Board, Senior Officers of the Railways and of the Commission of Railway Safety, requesting them for their views on such matters. Views and observations were also invited from the concerned Ministries of the Central

Government, the State Governments and Chambers of Commerce.

4. The two terms of reference of the Committee are distinct from each other. We decided that the review of accidents on the Indian Railways since the appointment of the Railway Accidents Inquiry Committee, 1968 (hereinafter referred to as the Wanchoo Committee) and of the implementation of their recommendations would constitute our first report and the second term of reference of the Committee regarding examination of the adequacy of the existing organisation, equipment and practices for ensuring safe running of trains on the Indian Railways and suggesting measures for prevention of accidents would be dealt with in our subsequent report.

Methodology

5. **Review of accidents on Indian Railways-** In the terminology of the Railways the term 'accident', which has been defined in Chapter II, envelopes a wide spectrum of occurrences or consequences thereof which not only affect safety but also ruse interference with normal working like failures of railway equipment, namely, engines, rolling stock and permanent way, etc., which may not necessarily mean a mishap. It is, however, the accidents which fall in the categories of collisions, derailments, accidents at level crossings and fires in trains, which ordinarily result in loss of life or limb or damage to property which agitate the public. We, therefore, decided to restrict the detailed review of accidents only to the main categories of accidents mentioned above as was done by the Wanchoo Committee. Beside Committee shall also review train accidents like averted collisions, breach of block rules, drivers passing signals at danger and train partings which carry a potential hazard to safety of train operations and in which cases it is only a fortuitous circumstance that actual mishap has been saved. Since the term of reference of the Committee requires them to review the

accidents on the Indian Railways since the appointment of the Wanchoo Committee, the review of accidents covered in this report will be for the period from April 1, 1968, to March 31, 1978.

6. It was estimated that a review on the aforesaid lines would cover around 20,000 train accidents and, in view of the volume of work involved, it was initially proposed to do this analysis with the help of a computer. The Railway Board estimated that about 300 computer hours would be required for this work and, for writing the programme, a detailed systems study would be necessary. They, however, felt that the Railways would not be Able to spare so much manpower or computer time since the maintenance of computers was in a transition stage due to the winding up of M/s. International Business Machines. A preliminary survey with the Indian counter part of the above-mentioned firm also showed that the work involved' was likely to take more than three months and a proper estimate of time could be had only after a systems study was undertaken. Such an analysis was estimated to cost Rs. 3 lakhs approximately. Enquiries made by us also revealed that the Indian Institute of Technology and the University Computers at Delhi were not in a position to handle the job of such a magnitude. In view of the above constraint, the Committee finally decided to compile and analyze the train accidents statistics without the use of a computer. Accordingly, 121 proforma were prepared and circulated to the Railways in October 1978 for compilation of the required statistics. This resulted in some setbacks to the schedule of work of the Committee.

7. We had asked the Railways to send the accident statistics, duly compiled, by 15th January 1979. However, till May 1979, part information in this respect had been received from only two Railways and nothing from the others. Since a detailed review of accidents would be possible only after accident statistics have been

received from all the Railways and duly analyzed, we give in the first report only a brief statistical appreciation of important categories of train accidents during the 10-year period ending 1977-78. Information in this respect has been obtained from the 'Supplement to the Report by the Railway Board on Indian Railways—Statistical Statements' published annually up to 1969-70. 'Accident Statistics of Indian Railways' published annually since 1970-71 and 'A Review of Accidents on Indian Government Railways' issued annually by the Railway Board. This appreciation is given in Chapter II. The detailed cause wise review of accidents will be dealt with in our subsequent report. We also give in Chapter III a review of the serious accidents which were statutorily inquired into by the Additional Commissioners of Railway Safety in exercise of the powers conferred on them under the Indian Railways Act, 1890 (9 of 1890). Information in respect of these was obtained from the annual reports on the working, of the Commission of Railway Safety issued by the Ministry of Tourism and Civil Aviation.

8. **Review of implementation of the recommendations made by the Wanchoo committee.-** The terms of reference of the Committee required them to review the implementation of the recommendations made by the Wanchoo Committee. The Wanchoo Committee had summarized their reports into recommendations and observations which aggregate to 729. However, since there is no clear-cut indication as to which item is a recommendation and which an observation, we have reviewed all these recommendations and observations. The more important of these have been dealt with in detail in Chapter V. In the case of recommendations which are merely observations or factual statements, or which have been fully or substantially implemented, or dealt with by the Railway Board by issuing appropriate instructions, we have not made any detailed comments. However, for convenience of reference, we have given in the Appendix to this report all these recommendations and

observations together with the views of and action taken by the Railway Board.

9. **Assessment of adequacy of the existing organisation, equipment and practices for ensuring safe running of trains:—** The Committee' decided that, for making an assessment in this respect, they would visit important installations and centers of railway activity, collect evidence from railway officers and staff at different levels and hold discussions with various organizations. Our detailed comments and recommendations on this term of reference will be given in the subsequent report.

10. We may point out that while reviewing the recommendations of the Wanchoo Committee, besides relying on the information given by the Railway Board, the Zonal Railway Administrations, the Research, Designs and Standards Organisation (hereinafter referred to as RDSO) and the Commission of Railway Safety, the Committee have also made use of material available in the statistics of the Railway Board, the Indian Railway Conference Association and the Commission of Railway Safety. We would like to make it clear that, in the light of material and information which may become available later on, the Committee may find it necessary to amplify, elucidate, supplement or amend in their subsequent report some of the observations made and conclusions drawn in this report.

11. In our detailed review of the implementation of the important recommendations of the Wanchoo Committee, which has been made in Chapter IV, we have at times been highly critical of the Railway Board and the Railway Administrations in respect of the action taken. This might convey the impression that safety on the Railways has deteriorated. This impression would not be correct. From the brief statistical review of the accidents given in Chapter II, was find that, broadly speaking, there has been a reduction in the

incidence of important accidents, namely collisions, derailments, accidents at level crossings and fires in trains as compared to the position obtaining at the time when the Kunzru and Wanchoo Committees went into this question, Prima facie, this is an indication that there has been an improvement in the overall safety record of the Railways.

The profile of Chairman

Shri S. M. Sikri

The latter part of the second half of 1977 saw two serious railway accidents in quick succession, involving heavy casualties and damage to railway property. The first was the collision between Howrah-Amritsar Deluxe Express and a goods train at Naini station on Mughal Sarai-Allahabad broad gauge section of the Northern Railway on October 10, 1977, and the second was the derailment of Ahmedabad-Delhi Mail between Ajarka and Bawal stations on Bandikui-Rewari meter gauge section of the Western Railway on November 11, 1977. These accidents had greatly agitated the public and deep concern was voiced in the Parliament and the Presi. It was against this background that the Minister of Railways, Prof. Madhu Dandavate, while making a statement in the Rajya Sabha on December 19, 1977, announced the Government's decision to constitute a committee to go into the whole question of accidents. Subsequently, the following

announcement was made by the Government of India through their Notification No. ERBI/77/21/86 dated January 3, 1978:

> "Having regard to the views expressed by the Members of Parliament and others on the recent rail accidents, the Minister of Railways announced in Parliament on December 19, 1977, the Government's decision to appoint a High-Power Accidents Enquiry Committee to go into the whole question of accidents."

The constitution of the Committee was as under:

Chairman

1. Shri S. M. Sikri, former Chief Justice of Supreme Court of India.

Members

2. Dr. Murli Manohar Joshi, Member of Parliament (Lok Sabha).
3. Shri Khurshid Alam Khan, Member of Parliament (Rajya Sabha)
4. Shri Bagaram Tulpule, former General Manage,' Durgapur Steel Plant and ex-Chairman, National Safety Council.
5. Shri P. Sahai. Ex-Member Railway Board.
6. Shri C.S. Parameswaran, Ex-General Manager, Railways.
7. Shri Arya Bhushan, Ex-Commissioner of Railway Safety.

Secretary

8. Shri V. K. Thapar, Joint Director (Safety), Railway Board.

The terms of reference of the Committee were as under:

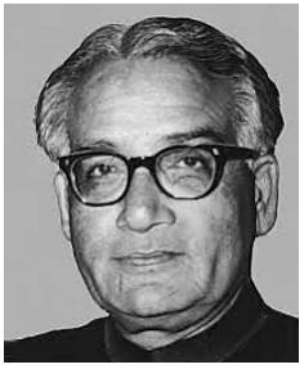
1. to review the position of accidents on the Indian Railways since the appointment of the Railway Accidents Inquiry Committee, 1968 and to review the implementation of their recommendations; and
2. to examine the adequacy of the existing organisation, equipment, and practices for ensuring safe running of trains on the Indian Railways, and to suggest measures for prevention of accidents.

The Committee was supposed to submit its report within six months of the date it starts functioning.

The profile of the committee's chairman and members are as under:

Shri S. M. Sikri, Former Chief Justice of Supreme Court of India
Chairman, High-Power Accidents Enquiry Committee, 1978

Sarv Mittra Sikri (26 April 1908 – 24 September 1992) was an Indian lawyer and judge who served as the 13th Chief Justice of India. He previously served as the first Advocate-General for Punjab, before becoming the first of nine judges of the Supreme Court of India, to be directly appointed from the Bar. Additionally, he is the first of only two judges to be CJI, directly from the Bar.



Shri Sarv Mittra Sikri

Sikri was born in Lahore on 26 April 1908. He moved to London to study medicine, but switched to law, studying at Trinity College, Cambridge. Before returning to Lahore in 1930, he served as a barrister-at-law at Lincoln's Inn, in London.

He began his legal practice in the chambers of Jagannath Agarwal, who was a leading advocate in the Lahore High Court and practiced criminal and civil law. Following independence, he was appointed the Assistant Advocate General of Punjab in 1949 and soon as the advocate general in 1951. Held the same position almost entirely until his elevation as a judge of the Supreme Court of India in 1964.

As an advocate, he appeared and practiced in various courts, ranging from the Lahore High Court and other courts in Punjab to the Federal Court of India and eventually the Supreme Court of India.

Justice Sikri was an alternate representative of India to the UN Committee on Codification and Development of International Law. In 1955 he was also a member of the International Law Association Committee on Rivers. In 1958, he also participated in the Law of Sea Conference at Geneva, as an Indian delegate. He also was actively interested in the work of the International Law Association cases (Indian branch).

After his retirement in 1973, he enjoyed the game of golf extensively. He later succumbed to Parkinson’s disease and passed away on 24th September 1992.

Notable Judgments

In the **Vivian Rodrick v. State of West Bengal**, Justice Sikri noted that a delay in disposing death sentence cases by courts is a valid ground for commutation of sentence. He acknowledged that

the long wait of six years caused tremendous mental agony, who lived under constant the fear of a death.

In the landmark case of **RC Cooper vs. Union of India**, Justice Sikri was a part of the majority opinion delivered by Justice Shah, who stated that a director or shareholder could not move the court for protecting the Fundamental Tights of a company unless it could be proved that the impugned action also violated his rights.

The landmark case of **Keshavananda Bharti** was heard by a 13-Judge Bench of the Supreme Court. Justice Sikri, writing for the Majority, held that while Parliament was empowered to amend the Constitution, including the Fundamental Rights chapter, its power to do so was not unlimited. Parliament was barred from amending the 'Basic Structure' of the Constitution. This Judgment was delivered by him on the eve of his retirement. Interestingly, some have argued that the impending retirement of Sikri J imposed an 'artificial constraint' on the hearings in this case. The Court did not want to prolong the hearings, as this would mean that a new Chief Justice would have to hear about the matter. Further, some claimed that Sikri J 'gerrymandered' a majority by circulating a single-typed sheet on the Bench. This sheet was signed by nine Judges confirming the majority.

The profile of Member

Dr. Murli Manohar Joshi, Member of Parliament (Lok Sabha)
Member, The Railway Accident Enquiry Committee, 1978



Shri Murli Manohar Joshi

Dr. Murli Manohar Joshi (born 5 January 1934) is an Indian politician. He is a member of the Bharatiya Janata Party (BJP) of which he was the President between 1991 and 1993. Joshi is the former Member of Parliament from Kanpur Lok Sabha constituency. He is a former professor of physics at the University of Allahabad. He is one of the seniors most leaders of the BJP and one of the founding members. Joshi later became the Union Human Resources & Development Minister in the National Democratic Alliance government. Joshi was awarded Padma Vibhushan, the second-highest civilian award, in 2017 by the Government of India. Joshi has been a member of RSS since his college days.

Joshi was born in Delhi on 5 January 1934. His family hails from Almora in the Kumaon region, which is now part of the Uttarakhand state. His father's name was Manmohan Joshi. The family belongs to the Brahmin community. In 1956, Joshi was married to Tarla Joshi, a lady of his own community and similar family background, in a match arranged by their families in the usual Indian way. Lifelong marriage has proven entirely harmonious and conventional. The couple are the parents of two daughters, Nivedita and Priyamvada.

Joshi had his early education in Chandpur, district Bijnor and in Almora, from where his family hails. He completed his B.Sc.

from Meerut College and M.Sc. from Allahabad University. In Allahabad, one of his teachers was Professor Rajendra Singh, who later became the Sarsanghchalak of the Rashtriya Swayamsevak Sangh.

Joshi did his doctorate in physics at Allahabad University. The subject of his doctoral thesis was spectroscopy. He published a research paper in Physics in Hindi, which was the first of its kind. After completing his PhD, Joshi started teaching physics at Allahabad University.

Joshi came in contact with the RSS in Delhi at a young age and took part in the Cow Protection Movement in 1953–54, in the Kumbh Kisan Andolan of UP in 1955, demanding halving of land revenue assessment. During the Emergency period (1975–1977) in India, Joshi was in jail from 26 June 1975 until the Lok Sabha elections in 1977. He was elected Member of Parliament from Almora. When the Janata Party (which then included his party) came to power forming the first non-Congress government in Indian history, Joshi was elected General Secretary of the Janata Parliamentary Party. After the fall of the government, his party came out of Janata Party in 1980, and formed the Bharatiya Janata Party or the BJP. Joshi first looked after the Central Office as a General Secretary and later became Party Treasurer. As General Secretary of BJP, he was directly in charge of Bihar, Bengal and North-Eastern States. Later, when BJP formed a government in India under Atal Bihari Vajpayee, Joshi served as the Human Resource Development Minister in the cabinet.

In December 1991, Joshi held a yatra, the Ekta Yatra, intended to signal that BJP supported national unity and opposed separatist movements. It began on 11 December in Kanyakumari, Tamil Nadu and visited 14 states. The rally's final stop to hoist the Indian

flag in Jammu and Kashmir on 26 January 1992 was considered unsuccessful, with minimal local participation.

Joshi is known to have been influenced by the life and work of Babasaheb Ambedkar, Mahatma Jyotiba Phule and Deendayal Upadhyaya. Joshi was a three-term M.P. from Allahabad before he was defeated in the Lok Sabha elections of May 2004. He won election to the 15th Lok Sabha from Varanasi as a BJP candidate. He also served as the home minister for 13 days government in 1996. Joshi was appointed as Chairman of the Manifesto Preparation Board of the BJP in 2009. He was honoured as "Proud Past Alumni" of Allahabad University by Allahabad University Alumni Association.

The profile of Member

Shri Khurshid Alam Khan, Member of Parliament (Rajya Sabha)
Member, The Railway Accident Enquiry Committee, 1978

Khurshed Alam Khan (5 February 1919 – 20 July 2013) was an Indian politician and a senior leader of the Indian National Congress political party.



Shri Khurshed Alam Khan

He was Governor of Karnataka from 1991 to 1999 and governor of Goa from 1989 to 1991. Before that, he was Union minister of External affairs in Government of India. He was associated with Jamia Millia Islamia.

Khurshed Alam Khan was born on 5 February 1919 in Pitaura, Kaimganj, Farrukhabad District of Uttar Pradesh into a Muslim

family of Pashtun descent, tracing their lineage to the Afridi and Kheshgi Tribes of Afghanistan. After his early education, he joined the Agra University as a student of St. John's College, where, he obtained bachelor's and master's degree in History. He was also a student at the University of Pennsylvania, U.S.A., where he completed a course in Management Studies.

Khan had an interest in education. He was a member of the Governing Body of Dr. Zakir Husain Memorial College, New Delhi. He served as Chairman of the Board of Governors of the YMCA Institute of Engineering, Faridabad. His abiding interest had been in the Jamia Millia Islamia University at Delhi.

It was through the efforts of Khan that Parliament enacted a Law whereby the Jamia Millia Islamia became an independent University. Khurshed Alam Khan was the Chancellor of this university. He was also member of Council of Indian Institutes of Technology.

Khurshed Alam Khan was a Parliamentarian for over 15 years as a member of the Rajya Sabha and the Lok Sabha. He was the member of the Rajya Sabha from 1974 to 1984 and the member of the 8th Lok Sabha from 1984 to 1989, representing Farrukhabad constituency. He was a Member of the Union Council of Ministers and has handled various portfolios, namely, External Affairs, Tourism, Civil Aviation, Textiles and Commerce.

As minister for External Affairs, he toured extensively in the world. He addressed the United Nations Security Council on several occasions. The Foreign ministers' Conference of Non-Aligned Countries at Delhi and Luanda was presided over by him. In 1988, he represented India at the Republican Party Convention of the U.S.A.

He resigned his Lok Sabha seat when he was appointed the

Governor of Goa on 18 July 1989. He also officiated as the Governor of Maharashtra. He has been the Governor of Karnataka since 6 January 1991. He also officiated as the Governor of Kerala.

The areas of special interest to Khurshed Alam Khan were education, tourism, transport, and urban development. Reading and Horticulture were favorite pastimes to which he devoted considerable time. Khurshed Alam Khan was the son-in-law of Dr. Zakir Hussain, the third President of India, married to his older daughter, Saeeda Khurshid. Salman Khurshid, former Union Minister for External Affairs (Indian Foreign Minister), is the son of Khurshed Alam Khan. He also has three daughters. He also has several grandchildren and was also present for a large part of his great-grandchildren's lives.

The profile of Member

Shri Bagaram Tulpule, Former General Manager,' Durgapur Steel Plant and ex-Chairman, National Safety Council

Member, The Railway Accident Enquiry Committee, 1978

Shri Bagaram Tulpule, a well-known Trade Union leader from Hind Mazdoor Sabha was appointed the GM and Chief Executive of Durgapur Steel Plant in 1971 by the then Union Steel Minister Sri Mohan Kumarmangalam, and remained on the job of managing Durgapur Steel Plant upto 1975 at a very critical period of History of the country - rise and slowing down of Naxalism esp in West Bengal - died in Pune on 4th June 2015. This was a great experiment of assigning responsibility to those who were on the opposite side of the Management and prove one's worth. Sri Tulpule succeeded.

Sri Tulpule left his post of Durgapur Steel Plant because he found it increasingly difficult to adjust himself to the situation which had

resulted in the Steel Authority of India (SAIL) gaining control over the steel industry. Contrary to the original concept of Mohan Kumaramangalam, SAIL had "centralized authority and functions to itself, though, oddly, remaining physically and hierarchically distant from the plants.

The India Today had published an article about him and his book called Amidst Heat and Noise - Durgapur Recalled, issue date: Jan 15, 1978, updated: Feb 6, 2015 16:15 IST, under the title **Amidst Heat and Noise - Durgapur Recalled by Bagaram Tulpule, AIMA, Pages 133, Rs 35**

> This unusual book is a valuable contribution to the meagre literature on management in India. It isn't often that a worker and a trade union leader, at loggerheads with the management, is appointed chief executive of an organization, and that too of a sensitive one like the Durgapur Steel Plant.
>
> The man who had the courage to take this step was Mohan Kumaramangalam, then minister for steel. He died in 1973 and could not see the whole experiment through. Tulpule was general manager of the Plant from 1971 to 1975, a difficult period for the steel industry; and he has, in this book, given a personalized and interesting account of the experiences he had with numerous and varied authorities with whom he had occasion to interact.
>
> He left his post because he found it increasingly difficult to adjust himself to the situation which had resulted in the Steel Authority of India (SAIL) gaining control over the steel industry. Contrary to the original concept of Mohan Kumaramangalam, SAIL had "centralized authority and functions to itself, though, oddly, remaining physically and hierarchically distant from the plants.
>
> Nor did Tulpule approve of the manner in which SAIL

handled wage negotiations with the unions. When it came to the formulation of policy and strategy on behalf of the steel industry the managements of various plants were kept out of the picture, according to Tulpule.

The main value of his book lies in the lessons that he has drawn about the manner in which the Government handles the public sector. Though it is generally accepted that the public sector should be subject to some governmental and parliamentary control in matters of objectives, policy, and general over-all performance, the nature of such control and the manner of its exercise are by no means clear, even conceptually, not to talk of the practice. There is hardly any autonomy, and the public sector companies find themselves subjected continuously to "queries, criticism and controls".

Tulpule is strongly of the view that the management of a public sector company should be given the widest possible freedom of discretion and action to achieve the set of objectives before it can discharge its responsibilities and be held accountable for results.

The tasks which a public sector company is called upon to perform are quite different from those of the administration. Mere conformity with rules and precedents is not enough.

Both Parliament, including its Committee on public undertakings (COPU), and the Government, however, took a different view in practice. Their approach was investigative and did not pertain to matters of policy or over-all performance. Tulpule is especially critical of Parliament and COPU which invariably compelled the minister to get involved in the affairs of the undertaking that fell within the purview of the management.

What is most unfortunate is that the boards of directors

and the managements of public undertakings readily acquiesce in this kind of ministerial and parliamentary control. In Tulpule's view one important reason is that managements find such "involvement" useful when dealing with press criticism, scrutiny by COPU, or regional or State Government pressures. The state has come when the public finds no distinction between management and ministerial responsibility. The effect of this kind of "ministerial involvement" on the innovativeness, initiative and style of public sector managers is disastrous.

Although Tulpule has written this book with a great degree of sympathy for the public sector managers, based on his own inside knowledge, he is critical of certain types who are non-committed, being birds of passage looking forward to some higher rewards.

He finds fault with their attitude towards unions - they are either patronized or considered an unavoidable nuisance, to be tolerated but kept at a distance. But Tulpule has a word of sympathy for the middle and lower level managers and officers who are "taken for granted" by the top management. In his view they are rarely taken into confidence about management plans, policies and important decisions, much less given any opportunity of influencing them.

"Workers" in the public undertakings, whether they are on the management or non-management side (a distinction which in practice makes no sense) will find Tulpule's book most rewarding, giving them a fresh insight into the problems facing the sector which commands the heights of our economy.

Summary of Recommendations

We summarise in the following paragraphs the recommendations made by us in Chapters III to XVII of this part of our Report.

The Human Element

1. The Railways should set up speedily an adequate personnel management Organization manned by persons with proper professional training and the right aptitude, and such Organization should reach all levels and points on the Railways at which administration has to deal with large number of employees. (Paras 119-121)
2. The departmental officers and supervisors who have to lead, take work from and look after the problems of workers, should be adequately exposed to the various subjects, concepts and skills in the area of management of people. (Paras 119-121)
3. An effective personnel management Organization backed up by an attitude of scrupulous fairness and a genuine concern for the workers as people should provide administration with the capability of dealing with the factors leading to erosion of discipline and decline in work standards. (Paras 122 & 123)
4. There should be only one recognised employee's union on such railway with a recognised federation at the apex.

   (Para 124)
5. The only way of discouraging category-wise unions seems to be for the administration to ignore them entirely, taking care at the same time to speedily resolve the problems of different categories of workers when these are brought up through the recognised unions. Administration must consciously build up its capability to cope with the temporary dislocations in operations forced by the category-wise unions.

   (Para 125)
6. Membership of supervisors in staff unions is not consistent with the position of supervisors as a part of the management. The exact modalities of how this is to be achieved requires consideration by the Government.

   (Para 126)
7. Firmness is as important as fairness and sympathy in administration's style and strategy for dealing with its employees. It is the responsibility of the higher echelons of Railway Administration to create confidence among front line supervisors and officers that, so long as they act in good faith and are not high-handed or vindictive, they will be backed in

ensuring discipline and proper work-standards. Equally, Government also must act in such a way that the hands of administration and its officers and supervisors are not weakened by extraneous political pressures.

(Paras 127 & 128)

8. Redressing grievance should be treated by the administration not as a welfare activity, but as extending to the employee his rightful due and the necessary sense of urgency brought to bear on this activity.

(Para 129)

9. The Railway Board must give serious thought to the question of adequately manning the Personnel Branch so that each employee is given his rightful due within a reasonable time before it shows up as a grievance.

(Para 130)

10. To remedy the situation created by sanction of awards concerning pay of staff which take retrospective effect, all awards should have prospective effect, In case of an award with retrospective effect, Government should indicate the lump-sum payments which should be made to staff, thus obviating the need to go into old records and detailed calculations.

(Para 131)

11. Measures to decentralise personnel functions to stations with a large strength of railway employees and major sheds should be adopted by zonal railways on the lines being tried out by the Southern Railway.

(Para 132)

12. Greater attention should be devoted to welfare in the real sense of the term and not confuse it with normal grievance redressal function of the administration.

(Para 133)

13. Rational determination of the optimum workload of welfare inspectors should be undertaken.

(Para 134)

14.

(i) The Railways should consider expanding schooling facilities for employee's children greatly.

(ii) Large schools with residential facilities should be established in cooperation with the Central Schools Organization, at a fairly large

number of suitable locations, distributed all over the country.

(Para 135 & 136)

15.

(i) It is important to see that no accident is liable to occur due to people not fully qualified being given posts which are concerned with the safety of the public.

(ii) While special provisions for promotion of Scheduled Castes/Scheduled led Tribes employees to safety categories, take some care of the efficiency of the promotee, they do not appear to consider the effect of such promotions on persons who have been superseded, and feel frustrated and disheartened. The depth and extent of frustration caused and its ill effects on safety of railway working should be studied further. (Para 138)

16. Psycho-technical testing should for the present, be used in the spirit of counselling procedure to help the employees to improve their performance. (Para 139)

17. All staff initially recruited in Class IV category, who by promotion may occupy positions vital for safety in train operation, should also be brought within the scope of psycho-technical testing right at the initial recruitment stage. (Para 139)

18. Directorate of Psycho-Technical Research should be set up in the RDSO which would pursue the various areas of testing of staff and research in applied psychology having relevance to safety in train operation. (Para 140)

19. Directorate of Psycho-Technical Research should have greater interaction with the departments of applied psychology in universities and other institutions. (Para 141)

20. In structuring the proposed Directorate of Psycho-Technical Research in the RDSO, the inadequacies of the present cell and the guaranteeing of reasonable prospects for personnel in this Directorate, commensurate with those obtaining elsewhere, be kept in view.

(Para 142)

Recruitment Training and Promotion Policy

21. Arrangements must be made to streamline the recruitment procedures so as to make available candidates as soon as vacancies arise.

(Para 143)

22. Direct recruitment to the category of firemen grade 'A' should be reviewed with immediate effect. (Para 145)

23.

(i) The scheme of training apprentices in railway workshops should be revived forthwith.

(ii) 50 per cent of the vacancies in the skilled cadres in workshops should be filled from trained apprentices.

(iii) The remaining 50 per cent vacancies in the skilled cadres should be filled from amongst railway men in lower grades with minimum educational qualifications of 8th class. They should receive intensive training for an appropriate period and be subjected to a suitable trade test before being absorbed in skilled categories.

24. In order to meet the larger requirements of electrical signal maintainers in Grade I: -

(i) 50 per cent vacancies in Grade I, should be filled by direct recruitment from graduates in Physics and Mathematics or diplomas holders in Electrical/Electronic Engineering followed by one year training. The remaining 50 per cent should be filled up by promotion.

(ii) In Grade II, all vacancies should be filled by promotion from Grade III.

(iii) In Grade III, the existing practice of filling 50 per cent by direct recruitment should continue. (Para 150)

25. Direct recruitment for mechanical signal maintainers Grade III should be given up, as this category is being fast displaced by electrical signal maintainers. (Para 150)

26.

(i) Signal inspectors should maintain, in addition to signalling, common telecommunication equipment in their jurisdiction after some initial training Telecommunication inspectors should be entrusted with specialised communication installations like Microwave, VHF and other wireless equipment and large telephone exchanges.

(ii) Lateral recruitment in the cadres of signalling and telecommunication inspectors should take into account a minimum of three grades of promotion, for each level of recruitment.

(iii) The minimum educational qualification for signal and telecommunication inspectors Grade III (extent 40 to 50 per cent) should be a diploma in Electronics / Telecommunication Engineering and for inspectors in intermediate Grade II (extent 25 per cent) it should be a degree in Electronics / Telecommunication Engineering.

(iv) The requirements of signal inspectors and telecommunication inspectors for recruitment purposes should be combined.
Vacancies should take into account, both permanent and temporary cadres including the anticipated requirements for works, deputation to RITES, RDSO and countries abroad.

(v) All the Railway Service Commissions should synchronise their timetable for recruitment of apprentice's signal and telecommunication inspectors in the initial and intermediate grades. (Paras 151 to 153)

27. The field of selection of welfare inspectors should be enlarged to cover other departments also; persons with the required aptitude and qualifications in social work should be inducted into the welfare Organization and trained.

(Para 154)

28. In the lowest recruitment grades in Class IV category, including casual labour, only persons with minimum educational qualification should be recruited. (Para 155)

29. Officers' cadre planning must be taken up in all seriousness to mitigate the acute scarcity of Class I (Category A) officers and to correct the imbalances which have occurred in different departments and in the divisions.

(Para 156)

30. Ways and means should be found of injecting adequately qualified engineers at different levels in the workshops, production units and open line.

(Para 157)

31. All factors which stand in the way of full utilisation of the available training capacity should be identified and remedied at the earliest. (Para 161)

32. The subject of training of staff and officers should be placed under the charge of a senior officer of the Personnel Department in the headquarters of each zonal railway. (Para 162)

33. Before the trainees proceed on training courses advance TA should be paid period of their course, to them for the whole.

(Para 163)

34. Adequate capacity for the refresher training of signal inspectors should be generated and utilisation thereof also ensured in greater measure. (Para 164)

35. Training of signal artisan staff, and promotional and other special courses should be decentralised and conducted in the zonal training schools where teaching could be done in the local language. (Para165)

36. Feedback on failures of signalling and interlocking gear and reports of accident enquiries, where signalling was held to be a cause, should be sent to the signal training schools and institutes regularly. (Para 166)

37. The signal and zonal training schools/institutes should be fully equipped with models and equipment. Provision therefor should be made in the project estimates of all new installations. (Para 167)

38. Regular training courses should be conducted for loco maintenance staff.

(Para 168)

39.

(i) The policy of selection of diesel and electric drivers should provide avenues for drafting surplus staff from the steam side and direct recruitment from the open market.

(ii) A minimum standard of education may be laid down for the selection of diesel and electric drivers from the steam side as well as for direct recruits.

(iii) Selected staff should be put through an intensive training course in the Diesel/Electric training schools.

(Para 169)

40. Training in signalling matters covering especially signal aspects and failures thereof, should form a part of syllabi for refresher training to drivers, Lectures covering ill-effects of drugs, liquors and intoxicants on the reflexes of a person, especially drivers and other running staff, should also form a part of the syllabi. (Para 171)

41.

(i) All staff in the carriage and wagon department on first promotion to semi-skilled, skilled and highly skilled grades should be given intensive training for an appropriate period before they are placed in their new positions.

(ii) Safaiwalas of the carriage and wagon department who have been promoted into semi-skilled skilled grade should be given special intensive courses at the earliest. The course content should take into account the educational background of such staff.

(iii) Refresher and vocational training courses must be planned for train examiners and other artisan staff at regular intervals. It should be ensured that the staff are regularly spared for these. (Para 172)

42. Train Examiners should be regularly sent for training at the Integral Coach, Factory, Perambur. (Para 173)

43. Artisan staff in workshops should be given regular refresher and vocational training. There should be a proper system for monitoring their training. Such staff should not suffer any monetary loss while they are away on training. (Para 174)

44. Regular training courses, including refresher training, should be given to operators and maintenance staff employed on ultrasonic rail flaw detectors. (Para 175)

45. Welfare inspectors should be given adequate and appropriate training to enable them to take up effectively the welfare activities of staff. (Para 176)

46. Persons of high calibre having aptitude for teaching, should be posted as instructors in the schools/institutes of training. Such persons should undergo instructors training course before taking over charge. (Para 177)

47. Instructors in training schools should be only in the highest grades of supervisory staff, namely, Rs. 840-1040 and Rs. 840-1200. (Para 178)

48. Heads of zonal training schools should be selected from one of the 5 major departments concerned with safety of train operation. They should ordinarily have a tenure of not less than 3 years. (Para 179)

49. The Railway Board should find ways and means of ensuring that staff who fail in refresher training course, are not employed on train passing duties till they pass such a course. (Para 180)

50. Before taking over charge, a Class II officer should be given adequate training. (Para 181)

51. The required number of trainee reserve posts for running staff as well as staff directly connected with safe working of trains should be created without any further delay and positions filled up at the earliest. It should also be ensured that staff connected with safe working of trains are sent for refresher training at the prescribed intervals. (Para 182)

52. Deputing of officers to seminars and short-term courses should be left to the General Manager who should be given full powers in this matter. (Para 183)

53.

(i) The faculty at the Railway Staff College, Vadodara should be strengthened in the major disciplines.

(ii) Major disciplines should be provided with technical or research assistants to help the professors in developing studies and research programmes.

(iii) There is need to revise the scale of honorarium for visiting lecturers. (Para 185 to 187)

54. Some urgent steps will have to be taken to modify the promotion policy to mitigate the more glaring aspects of discontent amongst staff. (Para 190)

Other Staff Matters

55. Essential categories of staff should be allotted quarters on priority near the place of work. (Para 191)

56.

(i) Construction of new staff quarters should be taken up for specific categories of staff like drivers, guards, firemen, assistant station master's etc. to improve their position of housing.

(ii) The entitlement of railway accommodation to drivers, guards and such other essential categories of staff should be reviewed so as to enable them to take proper rest.

(iii) Railway staff at divisional and headquarters of zonal railways, workshops, etc. should be encouraged to build their own houses to ease the pressure on railway accommodation. Housing amongst railway workers should be incentives given by way of easy loans of spare railway land. cooperatives encouraged and allotment

57. Leave reserve percentages for different categories of staff should be reviewed in the light of present leave entitlements of staff. (Para 196)

58.

(i) Running rooms should be provided with individual cubicles in which staff can take rest undisturbed.

(ii) Provision of basic necessities like clean linen, mosquito nets,

adequate water supply, electricity, etc., should be arranged and sanitary conditions improved.

(iii) Ways and means should be devised by the Railway Administrations to insulate running rooms against misuse by outsiders.

(iv) Running rooms should be located in close proximity to the place of duty.

(v) Trained cooks should be provided in running rooms to meet the needs of staff fully.

(vi) Railways should also consider establishing regular canteens in the larger running rooms. (Paras 197 & 198)

59.

(i) Crew rest vans should be provided with cushioned berths, lighting, fans, water, cooking facilities, bathrooms, etc.

(ii) Development of proper type of crew rest van in place of the existing 4-wheeler should be considered. (Para 199)

60. Assessment of the fatigue level in running/station staff in performing duty at night vis-a-vis day should be studied by the RDSO. This should form a rational basis for determining the limit of duty hours during nighttime. (Para 200)

61. The jurisdiction and workload of permanent way inspectors should be reviewed. (Para 201)

62.

(i) Permanent way inspectors must be relieved of the stores charge under them.

(ii) Permanent way stores depots each under the charge of a storekeeper, in appropriate grade, should be set up, one for each sub-division on the open line. (Para 202)

63. Some Adequate assistance should be given to permanent way inspectors to look after establishment maters properly. (Para 203)

64. Yardsticks should be laid down for the workload of inspectors of works on the basis of which their jurisdiction should be rationalised. (Para 204)

65. The workload of assistant engineers on the open line should be studied and their jurisdictions rationalised. (Para 205)

66.

(i) The creation of a traction cadre consisting mechanical and

electrical engineers, who would be responsible for the maintenance and running of diesel and electric locomotives, should be considered.

(ii) The workshop cadre should be separate from the traction cadre. (Para 206)

67. Encouragement should be given to all officers and supervisors to take up membership of technical and professional institutes and societies in this country as well as abroad. Membership fee and subscription paid by all officers to one national and one international institute/society and that paid by senior supervisors to one national institute/society should be reimbursed. (Para 208)

68. Encouragement should be given to officers and staff to acquire higher qualifications by providing them with facilities and granting incentives. (Para 209)

Permanent Way

69. Rail section 60 Kg per metre should be laid not only on sections carrying traffic more than 20 gross million tonnes but also on other routes where the density of traffic may not have reached that level but may be rapidly increasing.

(Para 212)

70. Use of rail section 41.61 Kg per metre (90 lb per yard) on selected metre gauge sections is a step in the right direction. This together with rail section 37.13 Kg per metre (75 lb per yard) priority should be given to tracks in important yards which handle large volumes of traffic. (Para 213)

71. The standard of track in yards should be upgraded in keeping with the standard prevailing elsewhere on the running lines. In doing so priority should be given to tracks in important yards which handle large volumes of traffic. (Para 214)

72. The requirement of funds for track renewals should be viewed by Government as an essential input for safety and should get commensurate priority. With escalating costs of renewals, unless much larger financial allocations are made, with immediate effect, the backlog will get totally out of hand.

(Para 215)

73. The condition of track from Gauhati to Furkating, on the Northeast Frontier Railway is far from satisfactory even from safety standards. Track renewals on this and other similarly 'distressed' sections should be

taken up on an urgent basis and completed within the shortest possible time. (Para 216)

74. The Railway Board should draw up a time- bound programme for upgrading the track on branch lines, which should be completed prior to the introduction of heavier axle locomotives on these lines. (Para 217)
75. Guidelines be laid down regarding the percentage of unserviceable sleepers that can be permitted in track and the extent of speed restriction which should be imposed with their progressive increase. (Para 218)
76. An all-India Organization under a separate General Manager should be set up for planning and execution of track renewals on the Railways. (Para 219)
77. The question of pricing of rails which is seriously affecting supplies to the Railways must be look- ed into by Government at the highest level. Conditions should be created so that the Steel Plants meet the requirements of the Railways in full. (Para 220)
78. Released rails should be reprofiled before being re-laid in frack. As a first step in this direction, 44.61 Kg per metre (90 lb per yard) rails released from broad gauge track must be reprofiled before these are re-laid in metre gauge track. (Para 221)
79. For monitoring of the rail wear, use should be made of the system of automatic rail wear inspection, with a self-propelled vehicle. (Para 222)
80. Arrangements for supply of wear-resistant rails by steel plants must be finalised early to meet the recurring requirements of the Railways. (Para 223)
81. Development and manufacture of thick web rails should be undertaken on a priority basis. (Para 224)
82. Production capacity for concrete sleepers, on both the broad and metre gauges, must be developed speedily for a long-term remedy of the problem of un-serviceable sleepers. (Para 225)
83. Necessary Organization must now be provided in the Civil Engineering Department to sustain the effort for procurement of permanent way fittings. (Para 226)
84. Ordering of permanent way materials required for track renewals and financial commitments therefor should be ensured well in advance, so

that supplies are received in time to carry out the work during the fiscal year itself. (Para 227)

85. The Railways must make full use of the available concrete sleepers for track circuiting works. It should also be ensured that concrete sleepers are laid in continuous lengths to avoid discontinuity in track structure. (Para 228)

86.

(i) The ballasting programme on the Railways must be speeded up to meet the requirements for recoupment of ballast on the basis of accepted norms Adequate funds for this purpose should be made available.

(ii) The functioning of ballast trains should be streamlined by providing adequate traffic blocks and suitable motive power. (Para 229)

87. The serious problem created by miscreant activity on certain sections of the South-Eastern Railway in removing stone ballast from track and disturbing the packing under the sleepers, should be taken up by the Railway Administration with the' State Government at the highest level. (Para 230)

88.

(i) The strength of permanent way. gangs should be correlated to the maintenance practices in vogue and the track structure actually obtaining. Arbitrary cuts in the hope of introducing modem methods of track maintenance/track structure will not be rational.

(ii) Finalization of the gang strength formula should not be delayed any longer and the strength of gangs must be rationalised on its basis within the shortest possible time. (Para 231)

89.

(i) 'Service' tolerances, indicating the limits beyond which track will need attention, must be laid down for various speeds and categories of tracks including branch and unimportant lines. These must be rigorously implemented through an effective system of monitoring.

(ii) The RDSO should examine the question of how much departure from the 'service' tolerances will be permissible without jeopardising safety. (Para 232)

90. The Railways must be equipped with an adequate number of portable accelerometers to supplement monitoring of track-by-track recording

cars. (Para 233)

91. The RDSO should lay down guidelines for working out the track geometry rating, on the basis of the parameters of track which are monitored, for assessing the state of track maintenance. (Para 234)

92. Guidelines should be laid down regarding tolerances for gauge, alignment, sleeper spacing, cross levels, unevenness, etc. to assist die permanent way staff to impose and progressively raise speed limits at engineering works. (Para 235)

93. Speed restrictions for engineering works should be planned in advance and within the overall limitations of time provided for engineering works in the timetable, these should become operative from a pre-determined hour. (Para 236)

94.

(i) Engineering restriction boards must be displayed at the maximum braking distance of trains-operating on the section.

(ii) It must be ensured that the speed restriction boards are displayed properly and those which require to be lit at night are done so affectively.

(iii) Development of electrically lit 'speed indicator lamps', to take the place of conventional speed restriction boards, should be undertaken for use on the Railways. (Paras 237 and 238)

95. Railways should make use of AWS system on track for protection of speed restrictions on sections where the AWS system is operative. (Paras 239 & 312)

96. More intensive use of the track recording-cum- research car must be planned. The projects assigned to this research car should be taken up with a sense of priority so that the benefits may flow to the field. (Para 240)

97.

(i) In major yards, tracks should be made ava HaWe for maintenance on the basis of a preplanned schedule.

(ii) Welding of rails in track, in major yards, should be undertaken.

(iii) Proper cleaning and maintenance of yards must be ensured so as to keep the interspaces between tracks clear and free from obstruction. Drainage in yards should be improved. (Paras-241 & 242)

98.

(i) Schedules for testing of rails with ultrasonic rail flaw detectors must be laid down for all types of tracks on the basis of importance of the line, traffic carried, speeds of trains, age of rails, trend of rail fractures, etc.

(ii) More determined and urgent steps should be taken to extend and intensify ultrasonic testing of rails in running lines.

(iii) Adequate number of rail flaw detectors must be provided on each division of the Railways to enable regular testing of rails on running lines.

(iv) Rails found defective by ultrasonic testing must be removed from track, timely.

(v) Tile Railways must develop adequate facilities for repair and maintenance and periodic calibration of ultrasonic rail flaw detectors. (Paras 243 to 245)

99. An arrangement should be provided on ultrasonic railway detectors to record the flaws in rails detected during testing.

(Para 246)

100. The Railways should go in for ultrasonic rail inspection cars as early as possible, with a view to quicken the pace of testing of rails in running track.

(Para 247)

101. The RDSO should carry out studies on the relationship between defects or flaws in rails and their propagation under actual traffic conditions, so as to arrive at the precise limit of defects in rails, necessitating their removal from track.

(Para 248)

102.

(i) In view of the inherent weaknesses in the thermit welding process, flash butt-welding of rails should be done to the maximum extent possible.

(ii) All new thermit welded' joints must be ultrasonically tested. (Para 249)

103. Manufacturing defects in the rails caused 21 per cent of the reported rail failures during 1977-78. Some arrangement should be made whereby every new rail put in track is subject to ultrasonic testing in advance.

(Para 251)

104.

(i) The Railway Board should ensure that information required by the RDSO for numerical analysis of rail failures, is furnished by all zonal railways, timely.

(ii) The RDSO should ensure that the results of yearly numerical analysis of rail failures are published and circulated to zonal railways with the least delay. (Para 252)

105.

(i) In view of the deleterious effect of flat tyres on rails in track, its permissible limit should be reviewed by the RDSO.

(ii) Effective means should be developed for detection of flat tyres on rolling stock. These should, under no circumstances, be permitted on running trains. (Para 253)

106. Self-propelled access platforms must be progressively introduced to facilitate inspection and maintenance of bridges and overhead structures. (Para 254)

107. The serious problem created by widespread theft of permanent way fittings from running lines on certain sections of the Eastern and South-Eastern Railways passing through the States of Bihar and West Bengal, must be taken up by the Railway Board and Railway Administrations, with the State Government (s) at the highest level. (Para 255)

108. The RDSO should undertake development of track fittings with a view to make their pilferage difficult. (Para 250)

109. The Railways must ensure that the basic necessity of a telephone is provided at the residence or ait permanent way inspectors oh the open hue. (Para 257)

110.

(i) At important stations where trains stop on platform lines, washable aprons should be provided.

(ii) Platform occupation should be planned in such a manner as to leave adequate time lor the maintenance of tracks on platform lines.

(iii) The subject of dropping wastes from passenger carrying trams should be given serious thought, unproved arrangements need to be devised so that platform lines do not give the impression of open-air toilets.

(Para 258)

Level Crossings

111.

(i) Manning of accident-prone unmanned level crossings, on the basis of stipulated norms, must be left to the Railways themselves who should complete this work within the shortest possible time.

(ii) Once the need for manning an unmanned level crossing/upgrading a manned level crossing is established, the work should be processed and completed expeditiously by the Railways; adjustment of cost etc. could be settled with the State Government (s) later. (Para 260)

112. Census at level crossings should be conducted regularly and expeditious follow-up action taken on the results thereof. (Para 261)

113. At level crossings where opening of the gates becomes necessary at night also, two gatemen must be provided on 12-hour shift duty. Alternatively, level crossings with light road traffic at night should be considered for being kept closed during that period. (Para 262)

114.

(i) State Governments should be encouraged to utilise the Railway Safety Works Fund to the extent of actual requirements, adjustments vis-a-vis actual share of each State, on the basis of extant rules of apportionment could be done on a long-term basis.

(ii) The Railways must be free to use accumulations under the Railway Safety Works Fund for manning of unmanned level crossing/upgrading of manned level crossings and for provision of road over/ under bridges

Arrangements outlined above may have political implications, however, in view of the large number of accidents endangering public, which continue to take place at level crossings, these should be worked out at the highest level.

(Para 263)

115. The rate of accidents at manned level crossings provided with telephones was much less than those without telephones. We strongly reiterate what we had recommended in Part I of our Report (paras 322-328) that telephone communication must be provided at all mid-section manned level crossings within the shortest possible time. (Para 264)

116. Speed breakers/bumps or rumble strips should, be provided on

approaches to all level crossings used by road vehicles. The drivers of approaching road vehicles should be pre-warned adequately or the existence of these.

(Para 205)

117. All Special, A and B class manned level crossings in mid-section should be protected by gate signals. All such level crossings in Centralised Traffic Control and Automatic Signalling territories should be given priority. (Para 266)

118.

(i) Devices in the nature of loud warning bells/hooters which are actuated by approaching trams should be provided at all manned level crossings in the mid-section. Priority should be given to level crossings in sections where the incidence of accidents has been high. Such devices should also be provided at unmanned level crossings frequented by road vehicles.

(ii) The RDSO should develop a warning device for level crossings, which will function satisfactorily in the conditions obtaining on the Railways. (Paras 267-269)

119. The involvement of tractors in accidents at level crossings has greatly increased in the States of Punjab, Haryana, and Uttar Pradesh. The Railways serving these States must take up with the State Governments the question of tractor drivers being made to observe safety rules at level crossings. (Para 270)

120. In certain areas there is high involvement of bullock carts in accidents at level crossings. The Railways should, in consultation with the State Governments, undertake a continuous programme, of educating the public in rural areas, through mass media of the hazards at level crossings and their responsibilities in this regard. (Para 271)

121.

(i) The Railways, in consultation with the State Governments, should examine the possibility of closing down some of the level crossings which are located in close proximity.

(ii) New unmanned level crossings should normally not be permitted and if they have to be provided, the decision should be taken only at a high level. (Para 273)

122. Speed Literate gatemen only, should be posted at manned level crossings having telephone communications. (Para 274)

123. More extensive trials with automatic half; barriers should be conducted

on non-suburban sections, away from metropolitan cities. (Para 276)

124. The Railways must ensure that working instructions are available at every level crossing and an assurance is taken from each gateman about his having understood these. (Para 275)

Signalling and Interlocking

125. For ensuring minimum basic safety of train operation as well as to guard against derailments at a station, rudimentary interlocking must, at least, be provided at all stations on the narrow gauge. (Para 279)

126. Guidelines should be laid down for upgrading the standards of interlocking at stations on the basis oi density and speed of traffic. (Para 280)

127. Maintenance work at signalling installations should be analysed and split into its various component units, separating items of routine maintenance from items of adjustments of signal and points fittings etc. requiring disconnection. (Para 281)

128. Only electrical signal maintainers in Grade I should be permitted to sign the Reconnection Notice in Form S&T/DN prescribed in Signal Engineering Manual. The disconnection notice may be signed by an electrical signal maintainer in a lower grade. (Para 282)

129.

(i) All problems connected with maintenance of signalling equipment should be thoroughly examined and a practicable and realistic solution found so as to ensure the availability of adequate time for maintenance.

(ii) Necessary time blocks should be provided in the timetable lor the maintenance of signalling and interlocking equipment, especially on busy time blocks can also be used maintenance programmes of track equipment. (Para 283)

130. Some minimum recovery time must be provided in the timetables which will cover detentions io trains on account of signal failures at least on the busy sections where important trains run. (Para 284)

131.

(i) At present the emphasis is only on periodical testing of locking and overhauling of lever- frames, and the electrical signalling portion including the circuitry does not receive such attention. AH electrical signalling equipment and circuitry must be inspected and

tested according to stipulated schedules.

(ii) Adequate time must also be provided on the sections to enable the signalling staff to effectively cany out inspection and testing of electrical signalling equipment.

(Para 285)

132.

(i) Only inspectors and maintainers who have undergone special training in sophisticated signalling equipment in the Indian Railways Institute of Signal Engineering and Telecommunication, Secunderabad, should be entrusted with the maintenance of such equipment.

(ii) A system of issuing competency certificates to staff, who successfully complete training in the specialised field of signalling, should be introduced. While posting staff in the field, especially on modern signalling installations, this should be taken into account. (Paras 286 & 287)

133. The progress and the follow-up action in the matter of providing electric lighting of distant signals has been extremely tardy. The Railway Board, having taken a decision, should have pursued it effectively. We stress that this work should now be completed without further delay. (Para 288)

134.

(i) Effective steps should be taken by all the concerned departments through more frequent inspections at different levels to improve the visibility of signals at night.

(ii) The work of electric lighting of semaphore signals should be progressed at a faster pace. (Para 289)

135. The For improving the visibility of colour light signals:

(i) Automatic voltage stabilisers be provided at different locations of signals.

(ii) Higher wattage bulbs, i.e. 33 watts instead of 25 watts should be used.

(iii) Improved design of double lenses should be used; and

(iv) Power supply should be drawn from OHE instead of local supply. (Para 290)

136. Joint inspection of signals by signal, loco and traffic inspectors, as per schedule, should be made more effective and intensive in order to ensure proper visibility of signals by day and by night. (Para 291)

137. All semaphore distant signals should be provided with electric signal motors, and these should be made to assume automatically the signal aspects, corresponding to the position of the home signals. (Para 292)

138. Colour fight signalling should be provided on a few remaining single line sections with A.C. traction. In doing so, advantage should be taken of the OHE power supply. (Para 293)

139. The conversion of semaphore signals into colour light signals at stations where signals of both types are there should be taken up on a programmed basis. (Para 294)

140. Route relay interlocking, which turns at centralising the control, must be provided at the more important junction stations.

(Para 295)

141. Norms for failures of signalling and interlocking equipment should be laid down for judging the efficiency of the system.

(Para 296)

142. Signal failures must be reviewed with the intention to learn more about the inadequacies of the system for taking corrective measures. The practice followed-on some divisions of the Western Railway important signalling and interlocking failures are analysed and discussed in detail along with remedial measures and are circulated to staff in the field for guidance, should be followed on all the railways.

(Para 297)

143. Signal defects or failures reported by drivers should receive prompt attention of the signal maintenance staff and remedial action taken without delay. (Para 298)

144. The station master on duty should report in writing or by telegram all cases of signal failures irrespective of whether a signal maintainer is available round the clock or not. (Para 299)

145. Signal failures which actually occur should be faithfully' recorded and reported and. there must be cross-checks on the. reported figures to ensure their veracity.

(Para 300)

146.

(i) Shortcut methods are adopted oy signalling staff in their maintenance, work, particularly while rectifying signal failures. The ‘looping’ or bridging of relays, under conditions of failure of a signal, points, or track circuit, by signal staff, either individually or jointly, with traffic

staff, should be prohibited under rules.

(ii) Where any sectional release is required in the interests of train operation, authorised technical solutions like calling-on signals and emergency cancellation switches should be employed with built-in safe-guards for safe movement of trains.

(Para 301)

147. Double locking of all relay rooms by the traffic and signalling staff as a safeguard against tampering with vital equipment in relay rooms and also to guard against the adoption of shortcut methods should be followed.

(Para 302)

148.

(i) Much higher allocation-of funds will be necessary to complete track circuiting works within a reasonable span of time.

(ii) The installation of an adequate number of axle counters, whether by import or by indigenous production, is not likely to materialise within a reasonable period of time and, therefore, the original proposal to extend, track circuiting using wooden/concrete sleepers for the remaining stations should be proceeded with and completed without delay.

(Paras 303 to 305)

149. The portion between fouling mark and advance starter, at stations on trunk routes and main lines must be provided with track circuiting using wooden sleepers or axle counters, on high priority. Constraints of funds and materials must not be allowed. to stand in the way. **(Para 306)**

150. Track circuiting must be provided at block huts also on main trunk routes where the run-through mam line at stations has been track-circuited. (Para 307)

151. On CTC sections where loads remain stabled for long periods the Railways should take steps to ensure that the conductivity of rails in such cases is maintained at satisfactory levels. (Para 308)

152.

(i) The Railway Board should give sufficient thought to the design now being adopted for manufacture of axle counters in regard to its reliability in service. They should not hesitate to adopt imported designs

of axle counters if reliability of indigenous design is in question.

(ii) Axle counters should be imported in part to cover the interim period of indigenous development.

(iii) The availability of axle counters, from sources within and outside the country, must be stepped up so that works of track circuiting are carried out on a time-bound programme.

(Paras 309 & 310)

153. While extending the Automatic Warning and Stop (AWS) system on all trunk routes with speed of 100 kmph. and above, covering all passenger and goods trains, recommended in Part I of our Report, the last stop signal, which is the authority to enter the block section, should also be provided with AWS equipment, in addition to the first stop signal.

(Para 311)

154. AWS equipment provided on the suburban sections of the Western Railway has the necessary infrastructure to facilitate introduction of a simplified system of cab signalling, which should be provided on such busy suburban, sections. (Para 313)

155.

(i) An effective monitoring system should be set up at different levels of maintenance and user departments for protection of AWS equipment from theft and outside interference.

(ii) Pilfer-proof housings should be provided for 11 field equipment of AWS system and the circuitry should incorporate earlier warning to the driver if the rack equipment is stolen. (Para 314)

156.

(i) In view of the serious nature and consequences of collisions on suburban sections, AWS system should be commissioned, on priority, on suburban sections of Bombay, Calcutta, Madras on a speedy time-bound programme.

(ii) Advance planning for provision of AWS system on suburban sections of the Southern Railway and Sealdah division of the Eastern Railway should be initiated straightaway. (Para 316)

157. The AWS system should incorporate a 20 kilometres per hour speed check so that trains, after stopping at an Automatic Signal at 'ON', cannot pick up speed in excess thereof till a signal displaying the OFF' aspect is reached.

(Para 317)

158. AWS equipment (of the type indicated in Para 317) should be provided not only on all Electric Multiple Unit trains but also on all main line passenger and goods trains running on the section. (Para 318)

159. As an interim measure till AWS system is introduced, an auxiliary warning switch to operate a red light in the motorman's compartment, should be provided as on the South-Eastern Railway. This should be operated by the motorman when he stops at an Automatic Signal at 'ON'. (Para 319)

160.

(i) A speed limit of 20 kilometres per hour should be specified for normal conditions of visibility under "Stop and Proceed" rule in automatic signalling and CTC territories.

(ii) The guard should be enjoined upon, under General Rules 278 and 437, to apply the brake with a view to bring the train to a stop when he observes the driver exceeding the speed restrictions laid down.

(Paras 320 & 321)

161. Motormen and drivers of trains in automatic signalling and CTC territories should be given a special course of training in signal training schools covering all aspects of the permissive working, as applicable to Automatic Block and Absolute Permissive Block Systems.
Further they should undergo refresher courses at least once every year. (Para 322)

162. Flashing lights in the rear of EMU trains, similar to those provided by the Western Railway, should be provided as a more prominent indication to attract the attention of the driver of a following train. (Para 323)

163.

(i) Technical measures suggested by a Committee of Directors of the Railway Board and the RDSO to overcome the problems of flickering/bobbing of signals and also display of more than one aspect by signals at the same time, should be implemented without delay.

(ii) General Rules 277 and 436 should be amended to include flickering/bobbing and display of more than one aspect by signals at the same time as defective signals on the lines of General Rules

78 and 79.

(Para 324)

164.

(i) The 'cascading' principle should be uniformly adopted on all Automatic Signalling and CTC territories so that when the green aspect bulb fuses, yellow aspect is displayed and so on and, under no circumstances, the driver comes across a signal without any light due to the fusing of signal bulb.

(ii) It must also be ensured that not more than one aspect of the signal appears at any one time, by using an improved design of lamp-proving relay. (Para 525)

165.

(i) Railways should take steps including Use of pilfer-proof fittings to ensure that all telephones at signals on CTC sections are kept in good working condition.

(ii) Telephone facility on signals should be provided in non-suburban Automatic Signalling sections like Rajkharswan-Sini-Chandil-Kandra on the South-Eastern Railway and Sitarampur-Pradhankanta on the Eastern Rahway. (Para 326)

166. (i) Maintenance gangs including assistant station masters required for non-interlocked working in the affected yards must be set up on the basis of arrears and normal workload of overhauling of lever frames and similar equipment and coordinated programmes of traffic-blocks should be drawn up for every division. (Para 327)

167. Yardsticks should be evolved, without further delay, for sectional signal inspectors and signal maintainers based on the workload in equated signal units with due allowance for local conditions. (Para 328)

168. The cadre of signal and telecommunication engineers and signal inspectors must be strengthened to the levels envisaged in the study of the Efficiency Bureau on the workload of these categories.

(Para 329)

169. Adjustment of jurisdictions of signal maintainers, provision of adequate rest givers and rostering of signal maintainers on the basis of proper job analysis of their work should be done. The time spent by maintainers in travelling should be properly renumerated. Signal staff for night maintenance on all trunk routes and busy yards should also be provided. (Para 330)

170. Testing instruments and equipment required by signal maintainers and

signal inspectors for the performance of their duties must be supplied to them and maintained in good order. (Para 331)

171. Railways should ensure that dual-trained signal inspectors are posted on all sections. (Para 332)

172. Tokenless block instruments should be provided on trunk routes in replacement of the outmoded token or tablet instruments. (Para 333)

173. Instructions of the Railway Board for providing bracketed home signals or alternatively track circuiting of main and loop lines with electrical detectors for facing points on sections of multiple aspect upper quadrant signalling with single arm home signals should be complied with by the Southern and Northeast Frontier Railways at the earliest. (Para 334)

174. Having commenced the running of superfast Vaigai Express between Madras-Madurai on the metre gauge system of the Southern Railway the basic requirements of signalling to permit safe operation of trains at that speed must be provided without any further delay.

(Para 334)

175. A satisfactory and reliable communication should be developed between trains in motion and ground station and also between functionaries on the train itself.

(Para 335)

176. Walkie-talkie wireless pack-sets should be provided extensively in all busy yards for use by traffic and loco staff dealing with movements in the yard. (Para 336)

177. Handbooks on installation and maintenance of different types of signalling equipment should be prepared and supplied to signal inspectors and signal maintainers for their guidance. (Para 337)

178.

(i) Revision of the Signal Engineering Manual should be taken in hand without further delay.

(ii) Copies of the Signal Engineering Manual should be supplied to all inspectors.

(iii) Relevant sections of the Signal Engineering Manual should be translated into regional languages and supplied to artisans and maintainers for their better understanding.

(Para 337)

179. The arrangement whereby reception and departure signals taken 'OFF

for a train should be restored to their normal position of 'ON' automatically by the passage of a train, incorporating 'one train- one slot' principle, should be adopted on both single- and double-line sections on trunk routes and main lines.

(Para 338)

180.

(i) The Railway Board should pursue with urgency development of a suitable indigenous design of last vehicle check device.

(ii) Pending development of a last vehicle check device, limited import may be resorted to.

(Para 339)

181. RDSO should investigate the use of solar energy for lighting of semaphore signals and even approach lighting of colour light signals. (Para 340)

182. The Railways should design all their future signalling systems on the basis of service braking distances. Existing signals on routes, where high speed trains run, should be relocated on this basis. (Paras 341 to 343)

183. A system of modular additions, like the superimposition of another distant signal over the existing signalling system for a block increase of one kilometre or below in braking distance, should be adopted for all high-speed routes, as has been done for the route between Howrah and New Delhi. (Para 344)

184. Any proposal of increase of speed on a route for one train or a class of trains should bp treated as a composite project involving the motive power, carriage and wagon, permanent way and signalling disciplines, and braking distance and inter-signal studies should be conducted jointly by all the concerned disciplines. (Para 345)

185. Appropriate steps should be taken to coordinate the activities in different signalling workshops with a view to utilising their full production capacity. (Para 346)

186. With a view to inject a sense of urgency and appreciation of the impact of signalling on safety and efficiency of train operation and evolve measures for speedy implementation of such projects on a planned basis the decision-making body in the Railway Board needs to be strengthened at the appropriate technical level.

(Paras 347 to 349)

Motive Power

187. Steam locomotives are going to be with the Railways for a long time to come, therefore, the Organization for their maintenance must not be weakened. Nothing should be done to reduce the effectiveness of this Organization by redeployment of well-qualified/ personnel to the diesel/electric side. (Para 351)
188. Head lights in steam locomotives must be maintained in fully operative condition. (Para 352)
189. Sanding equipment should be provided and maintained in proper working order on steam locomotives. This equipment should be specially certified at the time locomotive leaves the shed. (Para 353)
190.
    (i) Installation of the vigilance control device in diesel and electric locomotives, need not be pursued under conditions of train operation now obtaining on the Indian Railways, namely, two employees manning every diesel and electric locomotive.
    (ii) The vigilance control device may find application if and when the Indian Railways adopt a system of single manner crews on diesel and electric locomotives. Research and developmental efforts for evolving a suitable design, which will function satisfactorily without the present disabilities, may be continued. (Paras 354 to 357)
191. VDO speedometer in use at present on the Railways, which was designed for motor vehicles, is not suitable for locomotives. Import of Hasler speed recorders must be pursued with a sense of urgency. (Paras 358 to 359)
192. Considering that the speedometer problem has been with the Railways for nearly two decades, we feel that there has been a lack of determined effort to develop a suitable speedometer/speed recorder indigenously. (Para 360)
193. The new procedure for changing charts of speed recorders on locomotives, in force since January1980, according to which the driver has full access to the speed recorder charts, is apt to defeat the very purpose for which speed recording is found to be necessary. (Para 361)
194. Equipment of the type on trial on the Kottavalasa—Kirandul section of the South-Eastern Railway, which gives a clear indication to the driver

in case of train parting, would be useful and its trials should be expedited.

(Para 362)

195.

(i) Working of diesel locomotives with long hood leading has greater accident-proneness and also presents more difficulties in visibility of track and signals. In the overall interest of safety, trains should not be worked by diesel locomotives with long hood leading.

(ii) As a beginning, this restriction may be imposed on all passenger-carrying trains with maximum permissible speed of 100 kmph and over on the broad gauge and 75 kmph and over on the metre gauge.

(iii) This safety measure should also be extended to all trains hauled by diesel locomotives which run over difficult sections where the visibility of signals is restricted due to sharp cuttings, curves, etc.

(iv) As a long-term solution, provision of a second driving cab on diesel locomotives should be given serious consideration. (Paras 363 to 367)

196. Water level gauge in WDM2 diesel locomotives should be modified so as to serve the purpose for which at is intended.

(Para 368)

197. Cowcatchers and headlights should be provided in the rear of WDMI locomotives. (Para 369)

198. Adequate maintenance facilities should be provided in workshops and sheds for electric locomotives. These should keep pace with additions to the electric locomotive fleet. (Para 370)

199. AH diesel and electric locomotives and electrical multiple units manufactured in the country should be provided with the basic fittings so that mounting of AWS equipment on. the driving unit could be done without much difficulty at a later stage.

(Para 371)

200. It must be ensured that the bell communication between motormen and guards on EMU trains is maintained satisfactorily. (Para 372)

201. A reliable locking arrangement 'should be devised for the unoccupied motorman's/guard's compartments in EMU trains.

(Para 373)

Coaching and Goods Rolling Stock

202. The Railway Board should set up a committee consisting of officers of the mechanical and operating departments who will go into the pattern of goods train examination and rationalise it on an all-India basis, stipulating the places where examination should be carried out together with the type of examination to be done, and the time, facilities, equipment and manpower required for this purpose. The work of this Committee should be completed as quickly as possible. (Para 376 to 378)
203. Skipping of examination of goods trains should, ordinarily, not be permitted, but in case it becomes unavoidable, arrangements must be made to get the load examined within the shortest possible distance thereafter. (Para 379)
204. The practice of examining goods loads on sorting lines in marshalling yards should be stopped wherever it exists. (Para 382)

205. The practice followed on the South-Eastern Railway of deputing a mobile gang to examine a stabled load and give a fresh vacuum certificate, before it is allowed to move, should be adopted on other Railways.

(Para 383)

206. Adequate brake power and proper maintenance of brake rigging must be ensured. (Para 386)
207. Railways should take steps to see that the vacuum gauges are. invariably provided in guards' brake vans of all passenger carrying trains. (Para 387)
208. It-must be ensured that guards have a vacuum gauge fitted in the brake vans of goods trains. There is need for providing a satisfactory fixing arrangement for vacuum gauges. (Para 388)
209. The Railways should undertake trials to determine the extent of the loss of brake power in different trains, under' actual field conditions and take remedial measures accordingly. (Para 389)
210. Recommendations made by the RDSO regarding introduction of air brakes should be examined by the Railway Board and an early decision taken thereon. (Para 390)

211. With a view to ensuring satisfactory exam a nation -and maintenance of coaching stock: —

(i) timely placement/withdrawal of fakes on/from pit lines must be ensured.

(ii) adequate stabling capacity must be created to stable examined loads and release the pit lines for placement of other rakes.

(iii) Railways must immediately undertake a review of the pit line facilities and equipment required and make up the deficiencies on a time-bound programme.

(iv) all pit lines should be long enough to accommodate the longest passenger-carrying train in service and that contemplated in the near future.

(v) adequate lighting of pit lines should be ensured.

(vi) drainage in pit lines should be improved. Perhaps a change in the basic design of the pit is called for.

(vii) all slip coaches should be examined on pitlines. (Paras 392 to 394)

212.

(i) The Railways should be extremely cautious in the matter of introducing new train services and extending the run of the existing one. They must ensure that adequate maintenance facilities for carriages are created before new services are introduced.

(ii) In the face of popular demand for more and faster trains there are obvious limits to the resistance which the Railway Board and zonal railways can put up. The. political authority in the country should also not stretch the railway system too far.

(Paras 395 & 396)

213. Modernisation of sicklines and depots covering the provision of facilities like sheds, flooring, pathways for workers, plant, and machinery, equipment for handling materials, requirements of electric power, requirements of staff and their training should be taken up as a project. A task force, not bothered by the day-to-day stresses of railway working, must be set up to carry out this work within a period of five years. Necessary resources will have to be provided.

(Paras 397 & 398)

214.

(i) POH of coaching stock should be planned on the basis of kilometres earned so that more intensively worked rakes are given POH at shorter intervals than at present.

(ii) Arrangements to take up the increased workload of POH should precede the stipulation of revised intervals between two POHs.

(iii) The requirement of spare coaches should also be reviewed having regard to the fact that the coaches will have to be sent to the workshops more often.

(Paras 399 & 400)

215. EMU services should be so planned as to provide for the required time in shed. The Eastern Railway Administration should expand the existing facilities for POH/AOH to meet the maintenance requirements in full.

(Para 402)

216.

(i) The standard of maintenance of roller bearings in workshops should be improved so that attention to those on line does not become necessary at all during the intervals between two POHs.

(ii) If, however, the Railway Board and the Railway Administrations feel that inspection of roller bearings between two POHs is absolutely necessary, then conditions similar to those obtaining in workshops should be created in nominated sickness and maintenance depots.

(Paras 403 to 407)

217. The Railway Administrations should take urgent steps to provide adequate facilities for inspection and maintenance of roller bearings in workshops. (Para 408)

218. The recommendations made by the One-man Committee on roller bearings should be implemented expeditiously.

(Para 409)

219. The RDSO should develop some device to monitor the condition of roller bearings fitted on stock without the need to open them. (Para 410)

220. An urgent dialogue should be opened with the manufacturers of roller bearings, who should be apprised of the failures in service, for effecting improvement in the product. (Para 411)

221. The workshops and depots on zonal railways should follow a uniform system of giving identification numbers on roller bearings and maintaining record of the axle number on which it is mounted.

(Para 412)

222. In order to check the overloading of box wagons:

(i) weigh-bridges capable of weighing wagons on the move be provided at coal and mineral loading points.

(ii) arrangements be made for the proper upkeep and maintenance of weighbridges.

(iii) deterrent penalties like confiscation of materials in overloaded wagons be considered. (Paras 413 to 416)

223.

(i) Expeditious steps should be taken by the Railway Administrations to improve the quality of laminated springs manufactured in railway workshops.

(ii) Statistically optimum sample size should be ascertained, and that percentage of springs should be subjected to-load deflection test in workshops.

(Paras 417 to 419)

224. The practice of moving box wagons over long distances with clamped broken bearing springs is unsafe and should be curbed effectively. (Para 420)

225. The practice of turning out wagons from sick lines and depots with broken helical springs should be stopped fort with.

(Para 421)

226. In view of the large-scale failures of axles on carriages and wagons on the metre gauge, the RDSO must investigate the practice of using old broad-gauge axles for metre gauge rolling stock. The desirability of pressing out old wheel discs from usable axles must also be gone into. (Para 422)

227. Adequate equipment for ultrasonic testing of all axles should be made available in workshops and maintenance depots.

(Para 423)

228.

(i) Provision of modified draw bar on metre gauge goods stock should be completed within the shortest possible time.

(ii) Quality control and testing of material for draw bars and process control during their manufacture should be tightened.

(Paras 424 & 425)

229.

(i) The Neutral Control Organization should be brought under the charge of Director Mechanical Engineering in the Railway Board.

(ii) Neutral control examination should be extended to all workshops and major carriage and wagon maintenance depots.

(iii) At the remaining depots and sidelines, neutral control staff can be deputed on a selective basis depending upon the importance of the unit.

(iv) Neutral control examination should be extended to selected major yards depending upon the pattern of goods train examination, which will be adopted on the suggestions of the Committee, the setting up of which has been suggested by us in para 378.

(Paras 426 & 427)

230. Railway Board should finalise expeditiously the list of defects in coaching and goods stock which have a direct bearing on safety or 'S' marked items in the Conference Rules. (Para 428)

231. Handbooks for the guidance of carriage and wagon maintenance staff should be brought out in local languages for the benefit of staff not knowing English.

(Para 429)

232.

(i) While ordering safety modifications, the Railway Board should lay down a period within which these should be completed. The zonal Railway Administrations should have the authority to sanction additional manpower required for this purpose.

(ii) A special drive should be launched to complete all pending safety modifications on coaching and goods stock speedily.

(iii) Neutral train examiners posted in workshops, should make a special check on the execution of safety modifications on all coaches/wagons turned out of workshops.

(Paras 431 to 433)

233. Replacement of old and obsolete machines in workshops should be done at a faster pace. (Para 434)

234. The hand brake in EMUs should be provided in the motorman's cab.

(Para 435)

235. There is need for further research into the problem of corrosion in steel-bodied coaches. This should be undertaken in collaboration with other research institutes.

(Para 436)

236. Problems arising out of the greater height of coupling in CRT wagons than in other types should be examined and remedial action taken. (Para 437)

237. Railway Board should plan production of adequate number of anti-telescopic/steel bodied SLRs and coaches for broad and metre gauges to ensure strict compliance of marshalling instructions.

(Paras 438 & 439)

238. In the light of experience on the British Railways, the advantages of using centre buffer couplers on coaching stock in reducing casualties during accidents should be examined with a view to determining whether it would be desirable to adopt this on the Indian Railways. (Para 441)

Safety Organization

239. The Safety Organization should primarily be a service Organization and not an executive department. The responsibility of ensuring safety on the Railways is squarely that of the different departments and their accountability in this respect must not be diluted.

(Para 452)

240. The Safety Organization should be manned by officers from any of the 5 major departments, namely. Operating, Civil Engineering, Mechanical Engineering, Signal & Telecommunication Engineering and Electric Traction, who are mainly concerned with safety in train operations. (Paras 447 & 452)

241. At the divisional level, the Divisional Safety Officer should put up periodic reports to the Divisional Railway Manager/Divisional Superintendent on deficiencies and problems so that the latter can get the executive officers to take action. At the headquarters level, the Chief Safety Superintendent should report directly to the General Manager. (Paras 453 & 454)

242. Men of ability and dynamism should be posted to the Safety Organization to dispel the impression that it is a refuge for unwanted people. (Para's 443 4 455)

243. Persons posted to the Safety Organization should have a minimum

tenure of 2 years. (Paras 444 & 455)

244. The Divisional Safety Officer should be relieved of his miscellaneous function and left free to concentrate on his main responsibility of promoting safety on the division. (Paras 445 & 455)

245. The status of the Divisional Safety Officers should be brought on par with divisional officers of other executive departments. (Paras 446 & 455)

246. Each division should have safety counsellors from the four main disciplines, namely, Operating, Civil Engineering, Mechanical Engineering and Signal and Telecommunication Engineering. There should be provision to add to these counsellors from specialised disciplines like Electric Traction, wherever necessary. (Paras 448 & 455)

247. Safety counsellors should be appointed after a careful selection so as to ensure that they have, in addition to some technical background, a proper understanding of human nature and a flair for counselling work. (Paras 448 & 455)

248. The persons selected as safety counsellors should be given appropriate training in counselling techniques. (Para 455)

249. An effective system of monitoring the follow-up action on recommendations made by committees of inquiry into railway accidents should bd followed at the divisional and headquarters levels of zonal railways. (Paras 450 & 455)

250. Regular statistical studies must be done at the divisional and headquarters levels of zonal railways to analyse the short and long-term trends of various types of accidents and take remedial measures. (Paras 451 & 455)

251. Safety should be the only charge of Director, Safety in the Railway Board. He should also coordinate the efforts of zonal railways in the field of safety. (Para 457)

Accidents Statistics

252. The term “accident” should be applied to only the consequential accidents (Group I) and certain categories of miscellaneous accidents under Group III. Train partings should continue to be reckoned as

indicative accidents.

(Paras 458 to 462)

253. Every case of rail fracture should be reported and included in the statistics of permanent way failures. (Para 463)
254. A methodology should be evolved by which failures of tyres, wheels, axles, etc., are reported in totality to the Railway Administrations irrespective of the damage and other consequences. (Para 464)
255. The criterion of detention to traffic for classifying failures of signalling apparatus as failures of railway equipment should apply not only in the case of failures of route relay interlocking and CTO installations but also in the case of failures of other signalling and interlocking gears. (Para 465)
256. Accidents like derailments of light engines, trolleys, vehicles and wagons, etc. which occur in yards and at stations must be all reported irrespective of the cost of damage involved. Statistics thereof should be compiled and analysed for taking remedial measures.

(Para 467)

257. Truthful reporting and compiling of all accidents must be ensured so that accident records reflect the true picture of performance in the field of safety in operations.

(Para 468)

258. Maintenance of accident records, both at the divisional and headquarters level, must be placed on a satisfactory footing.

(Para 468)

Commission of Railway Safety

259. The Commission of Railway Safety should be placed under the Ministry of Railways, but independent of the Railway Board. The Chief Commissioner of Railway Safety should have direct access to the Minister of Railways. He should also be given a suitable status. (Para 481)
260. The officers of the Commission of Railway Safety should be empowered to summon witnessed from the public as in the case of Commissions of Inquiry. (Para 486)
261. The officers of the Commission of Railway Safety should be permitted to issue a brief press note giving the factual position and findings in non-technical language after the inquiry has been completed. (Para 487)

262. A few accredited representatives of recognised railway passenger associations and the press should be permitted to be present at the inquiries conducted by officers of the Commission of Railway Safety, except where the inquiring officer feels the need to take evidence in camera. (Para 488)

263. No railway officer should be allowed to sit with the inquiring officers of the Commission of Railway Safety during the course of the inquiries. (Paras 489 & 490)

264. The practice of sending the draft report of inquiry to the Railway Administration and the Railway Board should be given up. (Para 491)

265. All derailments and collisions involving superfast trains, irrespective of the casualties, should be inquired into by officers of the Commission of Railway Safety.

(Para 492)

266.

(i) The system of independent annual inspections by Commissioners of Railway Safety should be revived.

(ii) Maintenance certificates submitted by the various heads of departments of the zonal railways, which are appended to the annual reports of the General Managers, should be countersigned by the Commissioners of Railway Safety, as was the practice in the past. (Paras 493 to 495)

267. The Commission of Railway Safety should be expanded so that each circle covers one zonal railway only.

(Paras 496 & 497)

268. The Deputy Commissioner (General) at the headquarters of the Commission of Railway Safety should be in the rank of a commissioner. He should normally be drawn from a discipline different to the one to which the Chief Commissioner belongs. (Para 498)

269. The Government must take special steps to see that vacancies of Commissioners of Railway Safety and other officers of the Commission of Railway Safety are not allowed to lie unfilled for long. (Para 499)

270. All reports of inquiries into accidents made by officers of the Commission of Railway Safety should, be published promptly without exception. (Para 500)

271. Delays in the publication of annual reports of the Commission of

Railway Safety should be avoided. (Para 501)

272. The setting up of a National Transportation Safety Board on the same lines as in the U.S.A, must be considered by the Government. (Para 502)

Research, Designs and Standards Organization

273.

(i) There is the need for a more enlightened policy in respect of recruitment and promotion of personnel in the RDSO with a view to attracting and retaining really top-class talent.

(ii) Officers in RDSO should be retained for a minimum tenure period of 5-6 years.

(iii) Officers engaged on specific projects in RDSO should not be transferred till after the completion of the project. The service and promotional prospects of such officers should be fully safe-guarded.

(iv) The permanent cadre in RDSO should consist of persons with higher basic qualifications and to make this possible the pay scales should be more attractive.

(Para's 508 to 510)

274. The RDSO should be relieved of routine inspections of all items except those pertaining to the development of new projects, equipment and materials. (Para 511)

275. The RDSO should have complete powers to procure all stores required for research and development in respect of projects approved by the Railway Board.

(Para 512)

276. For effective monitoring of projects/rolling stock initiated by the RDSO in the field, zonal railways should nominate one senior officer of the concerned department to liaise with the RDSO. (Para 513)

277. The Railway Board should give priority to the setting up of a test track in the RDSO at the earliest. (Para 514)

278. The RDSO must be given powers, in line with, other premier research institutes in the country, to enable them to depute their officers and staff to participate in appropriate seminars and conferences abroad.

(Para 516)

279. The RDSO should be free to create, and fill-up posts required in connection with consultancy work and debit the expenditure against the fees recovered.

(Para 517)

280. Research and Development cells must be setup in production units and major workshops to review the processes, methods and materials for improving performance. The activities of these cells should be coordinated by the RDSO. (Para 518)

281. There should be greater integration and close cooperation between the RDSO and. the institutes of advanced training on the Railways, through exchange of visits, involvement of teaching faculty in research projects initiated by the RDSO. (Para 519)

Law and Order—Theft and Vandalism

282. The whole responsibility, jurisdiction and mutual relationship of the security agencies, namely, Railway Protection Force, Government Railway Police and State Police, which are involved is safeguarding of railway property be examined with a view to ensuring optimum cooperation among them for preventing thefts and other forms of lawlessness.

(Paras 528, 532 & 533)

283. Conditions must be created in which, staff, even at junior levels will be encouraged to report the theft, without fear.

(Paras 526 & 533)

284. Joint control centres be set up in cooperation with State Police, State Electricity Boards, Posts and Telegraph Department for speedy action in the case of theft OHE equipment and telephone wires, etc.

(Paras 532 & 533)

285. Measures should be taken by the Railway Administrations, in consultation with the RDSO, to evolve equipment which will be difficult to steal. (Para 533)

286. Efforts need to be made to educate the public about the nature and consequences of miscreant activity through mass media. Appropriate institutional and procedural arrangements should bet evolved. (Para 533)

Rules, Operation and Post Accident Relief Measures

287. The Railway Board should take effective action to overcome hurdles, if any, in bringing into force speedily the revised set of General Rules. (Paras 534 & 535)

288.

(i) Important rule books should be reprinted periodically, say once in 5 years, or when the number of correction slips exceeds 25.
(ii) Issue of rule book in a loose-leaf form should also be considered. (Para 536)

289. Rules must be drafted in simple language easily understood by staff. These should also be in the regional language, where necessary. (Para 537)

290.
(i) A uniform procedure applicable to all the zonal railways should be devised by which the station working rules are reviewed and reissued at regular intervals of 3 to 5 years.
(ii) Station working rules should be made into separate parts for the use of different categories: of station staff. (Paras 538 & 539)

291.
(i) Greater care should be exercised in the correct preparation of working timetables.
(ii) Working timetables should show inter-sectional running time of trains in integers correct to a minute and not a fraction thereof. (Para 541)

292. Field telephone should be provided to the guard of each goods train so that he can contact, the station master on either side of the occupied section. (Para 544)

293. The display of the normal and reverse positions of the facing points on indicators in the station master's office should be arranged. (Para 545)

294. A study should be made to determine the workload in hump yards beyond which the use of skids would become impractical and mechanisation becomes necessary. In non-mechanised hump yards, skid porters should be provided in every sorting line. (Para 546)

295. The working timetables should show the time taken between successive signals, by trains running at the restricted speed of 20 kmph after stopping at an automatic signal in 'ON' position. **(**Para 547)

296. The introduction of battery power operated tail lamps and hand signal lamps in lieu of oil lamps should be considered by the Railways. (Para 548)

297. The running of trains and pilots without brakevans should be curbed effectively by mitigating the chronic shortage of brakevans. (Para 550)

298. Working conditions and facilities in cabins should be improved. (Para 551)

299. In the case of staff connected with train passing duties, job analysis and work measurement according to modem industrial techniques must be undertaken to determine if any relief by way of additional strength or reduction in duty hours is warranted. (Para 552)

300. The Railway Administrations should take effective remedial action to restore the faith of staff in the sanctity of rules and check the drift towards the adoption of shortcut methods and violation of rules. (Para 554)

301. Hydraulic buffers should be provided at dead ends on platform lines at terminal stations. A suitable design of a hydraulic buffer should be evolved speedily. (Para 555)

302. Railway doctors should be given powers to hire road transport vehicles so that they may proceed to the site of the accident by the quickest; means. (Para 557)

303.

(i) For dealing with accidents involving gas cylinders, gas masks should be provided as a part of the equipment of the accident relief train.

(ii) With the introduction of electric traction, it would be necessary to have more and more of hydraulic jacks or MFD equipment for re-railing operations.

(iii) With the introduction of heavier locomotives, and wagons it is necessary to have more powerful cranes than at present.

Stores

304.

(i) For improving the availability of stores, the stores Organization should be divisional based.

(ii) Divisional Stores Officers should be brought under the direct control of the Divisional Railway Manager/Divisional Superintendent.

(iii) The set up at the divisional level should be assigned the purchase functions in respect of such items for which supplies could be obtainable from local sources, after it has been suitably strengthened.

(iv) For undertaking the purchase function effectively adequate powers should be delegated to the Divisional Stores Officer and Divisional Railway Manager.

(v) In the case of stores depots which serve specified workshops,

the Stores Officer should be placed under the control of the head of the workshop. (Paras 565 & 566)

305. In matters pertaining to escalation as well as splitting up of the tendered quantity amongst more than one tenderer, the General Manager should have full powers. (Para 567)
306. The procedure of risk purchase is not conducive to making quick alternate purchases. In the case of small value purchases, a penalty for default or forfeiture of the security deposit of the order and/ or removal from the list of approved suppliers would be more appropriate than resorting to risk purchases. (Para 568)
307. A comprehensive list of safety items of stores pertaining to different departments should be drawn up and procurement of these items should be through limited tenders, only from established and proven manufacturers of such stores. (Para 569)
308. The performance of the stores department in the matter of inventory control should not be judged only on the value of the inventory at the end of the financial year but on the basis of the average value of inventory over the entire 12-month period. (Para 570)
309. Railway materials should be given highest priority for movement and should be exempted from all booking restrictions. (Para 571)
310. Modem materials management systems should be adopted on the Railways. (Para 572)

REPORT OF THE RAILWAY ACCIDENTS ENQUIRY COMMITTEE, 1978

(SHRI S.M. SIKRI, 1978)

REPORT

OF

THE RAILWAY ACCIDENTS ENQUIRY COMMITTEE, 1978



PART -I

A statistical analysis of accidents 1968-1978 and review of implementation of the recommendations of the Railway Accidents Inquiry Committee, 1968

July 1979

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INTRODUCTORY

(CHAPTER.: I / THE RAILWAY ACCIDENTS ENQUIRY COMMITTEE, 1978: SIKRI COMMITTEE 1978)

1

The latter part of the second half of 1977 saw two serious railway accidents in quick succession, involving heavy casualties and damage to railway property. The first was the collision between Howrah-Amritsar Deluxe Express and a goods train at Naini station on Mughal Sarai-Allahabad broad gauge section of the Northern Railway on October 10, 1977, and the second was the derailment of Ahmedabad-Delhi Mail between Ajarka and Bawal stations on Bandikui-Rewari meter gauge section of the Western Railway on November 11, 1977. These accidents had greatly agitated the public and deep concern was voiced in the Parliament and the Presi. It was against this background that the Minister of Railways, Prof. Madhu Dandavate, while making a statement in the Rajya Sabha on December 19, 1977, announced the Government's decision to constitute a committee to go into the whole question of accidents. Subsequently, the following announcement was made by the Government of India through their Notification No. ERBI/77/21/86 dated January 3, 1978:

"Having regard to the views expressed by the Members of Parliament and others on the recent rail accidents, the Minister of Railways announced in Parliament on December 19, 1977, the Government's decision to appoint a High-Power Accidents Enquiry Committee to go into the whole question of accidents.

The constitution of the Committee will be as follows:

Chairman

1. Shri S. M. Sikri, former Chief Justice of Supreme Court of India.

Members

2. Dr. Murli Manohar Joshi, Member of Parliament (Lok Sabha).
3. Shri Khurshid Alam Khan, Member of Parliament (Rajya Sabha)
4. Shri Bagaram Tulpule, former General Manage,' Durgapur Steel Plant and ex-Chairman, National Safety Council.
5. Shri P. Sahai. Ex-Member Railway Board.
6. Shri C.S. Parameswaran, Ex-General Manager, Railways.
7. Shri Arya Bhushan, Ex-Commissioner of Railway Safety.

Secretary

8. Shri V.K. Thapar, Joint Director (Safety), Railway Board.

The terms of reference of the Committee will be as Under. —

3. to review the position of accidents on the Indian Railways since the appointment of the Railway

Accidents Inquiry Committee, 1968 and to review the implementation of their recommendations; and

4. to examine the adequacy of the existing organisation, equipment and practices for ensuring safe running of trains on the Indian Railways, and to suggest measures for prevention of accidents.

The Committee will submit its report within six months from the date it starts functioning.

(Sd.) B. MOHANTY,
Secretary, Railway Board
and
Ex-Officio Jt. Secretary to the Govt. of India."

002 After completing the Preliminaries an staffing of the Secretariat, the Railway Accidents Enquiry Committee-1978 (hereinafter referred to as the Committee) held their first meeting on March 27, 1978 to chalk out their course of action. Discussions were also held with the Minister of Railways, the Minister of State for Railways and the Chairman and Members of the Railway Board.

To advise the Committee on signal and tele-communication matters, the Government appointed Shri S. M. Gowri Shankar, Ex-Chief Administrative Officer, Railways and former Director, Signal and Telecommunications, Railway Board, as Consultant to the Committee.

Shri V. K. Thapar worked as Secretary November 25, 1978, and, on his proceeding abroad for training tinder the United Nations Development Programme, Shri R. S. Soin, Joint Director, Civil Engineering, (Track), Railway Board, took over as Secretary of the Committee from December 2, 1978.

Keeping in view the wide scope of investigations which have been entrusted to the Committee, the Government have extended its tenure Up to September 30, 1979.

003 The appointment of the Committee was given wide publicity through public notices in all important English and Hindi newspapers and also one leading newspaper commanding wide circulation in regional languages. A comprehensive questionnaire was issued to the Railway Administrations, the Commission of Railway Safety, the two recognized trade union Federations, the Federation of Railway Officers Associations and the Railway Service Commissions, soliciting information and their views on specific issues of railway working which have a bearing on the safe running of trains. Communications were also addressed to retired Chairmen/Members of the Railway Board, Senior Officers of the Railways and of the Commission of Railway Safety, requesting them for their views on such matters. Views and observations were also invited from the concerned Ministries of the Central Government, the State Governments and Chambers of Commerce.

004 The two terms of reference of the Committee are distinct from each other. We decided that the review of accidents on the Indian Railways since the appointment of the Railway Accidents Inquiry Committee, 1968 (hereinafter referred to as the Wanchoo Committee) and of the implementation of their recommendations would constitute our first report and the second term of reference of the Committee regarding examination of the adequacy of the existing organisation, equipment and practices for ensuring safe running of trains on the Indian Railways and suggesting measures

for prevention of accidents would be dealt with in our subsequent report.

Methodology

005 **Review of accidents on Indian Railways-** In the terminology of the Railways the term 'accident', which has been defined in Chapter II, envelopes a wide spectrum of occurrences or consequences thereof which not only affect safety but also ruse interference with normal working like failures of railway equipment, namely, engines, rolling stock and permanent way, etc.. which may not necessarily mean a mishap. It is, however, the accidents which fall in the categories of collisions, derailments, accidents at level crossings and fires in trains, which ordinarily result in loss of life or limb or damage to property which agitate the public. We, therefore, decided to restrict the detailed review of accidents only to the main categories of accidents mentioned above as was done by the Wanchoo Committee. Beside carries shall also review train accidents like averted collisions, breach of block rules, drivers passing signals at danger and train partings which carry a potential hazard to safety of train operations and in which cases it is only a fortuitous circumstance that actin? mishap has been saved. Since the term of reference of the Committee requires them to review the accidents on the Indian Railways since the appointment of the Wanchoo Committee, the review of accidents covered in this report will be for the period from April 1, 1968, to March 31, 1978.

006 It was estimated that a review on the aforesaid lines would cover around 20,000 train accidents and, in view of the volume of work involved, it

was initially proposed to do this analysis with the help of a computer. The Railway Board estimated that about 300 computer hours would be required for this work and, for writing the programme, a detailed systems study would be necessary. They, however, felt that the Railways would not be Able to spare so much manpower or computer time since the maintenance of computers was in a transition stage due to the winding up of M/s. International Business Machines. A preliminary survey with the Indian counter part of the above-mentioned firm also showed that the work involved' was likely to take more than three months and a proper estimate of time could be had only after a systems study was undertaken. Such an analysis was estimated to cost Rs. 3 lakhs approximately. Enquiries made by us also revealed that the Indian Institute of Technology and the University Computers at Delhi were not in a position to handle the job of such a magnitude. In view of the above constraint, the Committee finally decided to compile and analyze the train accidents statistics without the use of a computer. Accordingly, 121 proforma were prepared and circulated to the Railways in October 1978 for compilation of the required statistics. This resulted in some setbacks to the schedule of work of the Committee.

007 We had asked the Railways to send the accident statistics, duly compiled, by 15th January, 1979. However, till May 1979, part information in this respect had been received from only two Railways and nothing from the others. Since a detailed review of accidents would be possible only after accident statistics have been received from all the Railways and duly analyzed, we give in the first report only a brief statistical appreciation of important categories of train accidents during the 10-year period ending 1977-78. information in this respect has been obtained from the

'Supplement to the Report by the Railway Board on Indian Railways—Statistical Statements' published annually up to 1969-70. 'Accident Statistics of Indian Railways' published annually since 1970-71 and 'A Review of Accidents on Indian Government Railways' issued annually by the Railway Board. This appreciation is given in Chapter II. The detailed cause wise review of accidents will be dealt with in our subsequent report. We also give in Chapter III a review of the serious accidents which were statutorily inquired into by the Additional Commissioners of Railway Safety in exercise of the powers conferred on them under the Indian Railways Act, 1890 (9 of 1890). Information in respect of these was obtained from the annual reports on the working, of the Commission of Railway Safety issued by the Ministry of Tourism and Civil Aviation.

008 Review of implementation of the recommendations made by the Wanchoo committee.- The terms of reference of the Committee required them to review the implementation of the recommendations made by the Wanchoo Committee. The Wanchoo Committee had summarized their reports into recommendations and observations which aggregate to 729. However, since there is no clear-cut indication as to which item is a recommendation and which an observation, we have reviewed all these recommendations and observations. The more important of these have been dealt with in detail in Chapter V. In the case of recommendations which are merely observations or factual statements, or which have been fully or substantially implemented, or dealt with by the Railway Board by issuing appropriate instructions, we have not made any detailed comments. However, for convenience of reference, we have given

in the Appendix to this report all these recommendations and observations together with the views of and action taken by the Railway Board.

009 **Assessment of adequacy of the existing organisation, equipment and practices for ensuring safe running of trains:—** The Committee' decided that, for Making an assessment in this respect, they would visit important installations and centers of railway activity, collect evidence from railway officers and staff at different levels and hold discussions with various organizations. Our detailed comments and recommendations on this term of reference will be given in the subsequent report.

010 We may point out that while reviewing the recommendations of the Wanchoo Committee, besides relying on the information given by the Railway Board, the Zonal Railway Administrations, the Research, Designs and Standards Organisation (hereinafter referred to as RDSO) and the Commission of Railway Safety, the Committee have also made use of material available in the statistics of the Railway Board, the Indian Railway Conference Association and the Commission of Railway Safety. We would like to make it clear that, in the light of material and information which may become available later on, the Committee may find it necessary to amplify, elucidate, supplement or amend in their subsequent report some of the observations made and conclusions drawn in this report.

011 In our detailed review of the implementation of the important recommendations of the Wanchoo Committee, which has been made in Chapter IV,

we have at times been highly critical of the Railway Board and the Railway Administrations in respect of the action taken. This might convey the impression that safety on the Railways has deteriorated. This impression would not be correct. From the brief statistical review of the accidents given in Chapter II, was find that, broadly speaking, there has been a reduction in the incidence of important accidents, namely collisions, derailments, accidents at level crossings and fires in trains as compared to the position obtaining at the time when the Kunzru and Wanchoo Committees went into this question, Prima facie, this is an indication that there has been an improvement in the overall safety record of the Railways.

BRIEF STATISTICAL APPRECIATION OF IMPORTANT CATEGORIES OF TRAIN ACCIDENTS DURING THE PERIOD 1968-69 TO 1977-78

(CHAPTER: II / THE RAILWAY ACCIDENTS ENQUIRY COMMITTEE, 1978: SIKRI COMMITTEE 1978)

2

012 The 'Review of Accidents on Indian Government Railways' publish-ed annually by the Railway Board defines an 'accident' as under:—

> *"Any occurrence which does or may affect the safety of the Railway, its engines, rolling stock, permanent way, works, passengers, or railway servants or which affects the safety of others, or which does or may cause delays to train or loss to the Railway is termed as an accident."*

For the purpose of our enquiry, accidents have been broadly grouped as under: —

> **Group I** Collisions, derailments, accidents at level crossings and fires in trains. These are referred to as 'Consequential' accidents.
>
> **Group II** Failure of railway equipment, viz, failure of locomotives, rolling stock, permanent way, overhead wires, signalling apparatus, etc.

Group III Miscellaneous accidents, such as trains running over obstructions; collisions involving light engines, trollies, derailments of light engines, fires at stations, etc.

Group IV Technical accidents such as breach of block rules, disregard of signals by drivers, averted collisions, and train partings. These are also referred: to as 'Indicative' accidents.

013 For reasons given in Chapter I, it has not been possible for us to carry out a detailed causeries analysis of accidents on the Railways so far. The review in this Chapter is more in the nature of a broad statistical probe to see if there is any noticeable trend in the occurrence of accidents falling in the aforesaid four groups. The Wanchoo Committee had covered a period of 5 years from 1963-64 to 1967-68. Our review covers a period of 10 years from 1968-69 to 1977-78. In order to view the trends in comparative perspective, we have, wherever possible_ given the corresponding_ figures for the years 1963-64 to 1967-68 in juxtaposition.

014 Incidence of total accidents:— For an appreciation of the safety performance of the Railways, the incidence of accidents falling in Groups I to III since 1963-64, as given in the annual reviews issued by the Railway Board is shown in Annexure I. This trend is depicted in Graph I. We find that, after a steady fall in the incidence of total accidents to 10.4 per million train kilometers during 1971-72, it sharply rose to 15.2 in 1972-73 and further to 25.0 in 1974-75. This was followed by a decline for two years and then a rise again in 1977-78 when the incidence

to total accidents per million train kilometers was 20.9 as compared to 18.7 in the previous year. This does not reveal a healthy trend.

015 **Casualties in accidents:-** Of all the accidents, those which fall in Group I normally result in casualties or damage to property. The casualties and damage which took place in Group I accidents as compared to those in the total number of accidents during the years 1968-69 to 1977-78 are given in Table I below:

TABLE 1
Casualties and loss due to damage in accidents during the period 1968-69 to 1977-78

	Type of accident:	Number	Casualties			Loss due to damage (Rupees in lakhs)
			Killed	Injured	Total	
1	All types of accident (Groups I, II, and III)	78,247	2,118	7,724	9,842	2,783
2	Important accidents (Group I only)	8,705	2,052	7,344	9,396	2,150
3	Percentage (2)/(1)X00	11.1	96.9	95.1	95.5	77.3

016 It will be seen that while accidents in Group I constituted only 11 per cent of the total number of accidents, they accounted for as much as 97 per cent of the deaths, 95 per cent of the injuries and 77 per cent of the loss due to damage property. In view of the serious consequences of such accidents, the Kunzru and the

Wanchoo Committees had referred to these as 'important' accidents. We have adopted the same terminology. For the same reason, we have made a more detailed survey of the occurrence of Group I or 'important' accidents, indicating only the annual incidence of the accidents which fall in the remaining three groups. Group I or 'important' accidents:

017 Overall incidence:- The incidence of important accidents, gauge-wise, in relation to the density of traffic, is shown in Table 2 below:-

TABLE 2

Incidence of important accidents-Gauge wise

Year	Number of accidents	Train kilometers (in millions)	Incidence of accidents per million train kilometers	Index of incidence
1	2	3	4	5
Broad Gauge				
1962-63	907	266.96	3.3	100 (base)*
1963-64	827	270.0	3.1	94
1964-65	589	276.9	2.1	64
1965-66	535	287.4	1.9	58
1966-67	484	291.3	1.7	52
1967-68	503	295.1	1.7	52 100 (base)*
1968-69	435	305.87	1.42	84
1969-70	447	315.56	1.42	84
1970-71	381	311.93	1.22	72
1971-72	377	320.45	1.18	69
1972-73	388	320.0	1.21	71
1973-74	377	301.94	1.25	74
1974-75	450	305.98	1.47	86
1975-76	463	342.51	1.35	79
1976-77	383	361.27	1.06	62
1977-78	414	376.23	1.10	65
Meter Gauge				

1962-63	858	129.70	6.5	100 (base)*
1963-64	732	133.09	5.5	85
1964-65	610	137.36	4.4	68
1965-66	598	140.43	4.3	66
1966-67	533	140.88	3.8	58
1967-68	528	139.97	3.8	58 100(base)*
1968-69	421	142.31	2.96	78
1969-70	456	145.58	3.13	82
1970-71	400	143.51	2.79	73
1971-72	428	142.77	3.00	79
1972-73	363	140.18	2.59	68
1973-74	346	119.65	2.89	76
1974-75	421	114.45	3.68	97
1975-76	455	134.44	3.38	89
1976-77	358	139.49	2.57	68
1977-78	393	138.57	2.84	75
Narrow Gauge				
1962-63	130	11.36	11.4	100 (base)*
1963-64	83	11.41	7.3	63
1964-65	80	11.37	7.0	61
1965-66	67	11.31	6.0	53
1966-67	73	11.54	6.3	55
1967-68	74	11.66	6.3	55 100(base)*
1968-69	52	11.72	4.44	70
1969-70	60	11.70	5.13	81
1970-71	59	11.45	5.15	82
1971-72	59	11.26	5.24	83
1972-73	62	11.26	5.51	87
1973-74	59	9.68	6.10	97
1974-75	54	9.16	5.90	94
1975-76	46	9.43	4.88	77
1976-77	39	9.51	4.10	65
1977-78	59	10.11	5.84	93

*1962-63 has been taken as the base for the 5-year period commencing from 1963-64
1967-68 has been taken as the base for the 10-year period commencing from 1968-69.
*1962-63 has been taken as the base for the 5-year period commencing from 1963-64
1967-68 has been taken as the base for the 10-year period commencing from 1968-69.

018 It will be seen that, on the broad and meter gauges, there was, by and large, a fall in the incidence of important accidents per million train kilometers except for the years 1974-75 and 1975-76 during which there was an increase. After some improvement in 1976-77, the incidence of important accidents again increased in 1977-78 both on the broad and meter gauges. On the narrow gauge, after an abrupt fall during 1968-69, the incidence of important accidents per million train kilometers steadily rose to 6.10 during 1973-74. This was followed by a decline for three years to 4.10 in 1976-77. In 1977-78 there was a significant increase in the incidence of important accidents to 5.84 per million train kilometers.

019 The number of important accidents taken category wise, *viz.*, collisions, derailments, accidents at level crossings and fires in trains which occurred since 1963-64 is given in Annexure II. The trend is shown in Graph 2. In the paragraphs that follow we have discussed the incidence of these in detail. In order to highlight the relative hazard potential of the different categories of important accidents, casualties and loss due to damage which resulted from these are given in Table 3.

TABLE 3
Casualties and loss due to damage in important accidents during the period 1968-69 to 1977-78

A-Number of accidents/casualties/amounts of loss
B- 'A' taken as a percentage of the total against item 5.

	Category of accident	A or B	Number of accidents and percentage of the total	Casualties			Loss due to damage (Rupees in lakhs)
				Killed	Injured	Total	
1	Collisions	A	571	617	2938	3.555	770
		B	6.6	30.1	40.0	37.8	35.8
2	Derailments	A	6728	368	1656	2024	1296
		B	77.3	17.9	22.6	21.5	59.0
3	Accidents at level crossings	A	1159	927	2293	3220	5
		B	13.3	54.2	31.2	34.3	0.3
4	Fires in trains	A	247	140	457	597	105
		B	2.8	6.8	6.2	6.4	4.9
5	Total number of important accidents		8705	2052	7344	9396	2150

020 It will be seen that though collisions constituted 6.6 per cent of the total number of important accidents during the period 1968-69 to 1977-78, these accounted for 30.1, 40 and 35.8 per cent of the deaths, injuries and loss due to damage to railway property respectively. Accidents at level crossings resulted in the largest number of fatalities, mainly of road users; these accounted for 45.2 per cent of the persons killed in important accidents. Derailments constituted 77.3 per cent of the total number of important accidents and accounted for 17.9, 22.6 and 59 per cent of the deaths, injuries and loss due to damage to railway property respectively.

021 **Collisions.-**The incidence of train collisions per million traits kilometers and their number, gauge-wise, are given in Table 4. The

trend is shown in Graph 3.

TABLE 4

Incidence of train collisions-gauge wise

A-Number of train collisions
B - Incidence of
train collisions per million train kilometers.

Year	Broad Gauge		Meter Gauge		Narrow Gauge		Total	
	A	B	A	B	A	B	A	B
1963-64	58	0.21	25	0.18	3	0.26	86	0.20
1964-65	54	0.19	29	0.21	3	0.26	86	0.20
1965-66	58	0.20	21	0.14	Nil	..	79	0.18
1966-67	51	0.17	16	0.11	1	0.09	68	0.15
1967-68	48	0.16	20	0.14	2	0.17	70	0.16
1968-69	36	0.12	11	0.08	Nil	..	47	0.10
1969-70	40	0.13	14	0.10	Nil	..	54	0.11
1970-71	48	0.15	11	0.08	Nil	..	59	0.13
1971-72	38	0.12	17	0.12	2	0.18	57	0.12
1972-73	44	0.14	14	0.10	1	0.09	59	0.13
1973-74	58	0.19	7	0.06	1	0.10	66	0.15
1974-75	52	0.17	14	0.12	Nil	..	66	0.15
1975-76	48	0.14	16	0.12	Nil	..	64	0.13
1976-77	38	0.11	7	0.05	Nil	..	45	0.09
1977-78	44	0.12	9	0.06	1	0.10	54	0.10

022 As was observed by the Kunzru and Wanchoo Committees also, the incidence of train collisions per million train kilometers on the metro gauge has all along been less than that on the broad gauge. On the broad gauge, after a sharp drop in the incidence of train collisions to 0.12 per million train kilometers in 1968-69 as compared to 0.16 in the 'previous year, it fluctuated between 0.12 and 0.15 till 1973-74 when

there was a sharp increase to 0.19. This was followed by a declining trend. On the meter gauge also, there has been a general declining trend. On the narrow gauge too, the incidence of train collisions has come down in recent years.

023 The incidence of train collisions involving passenger* and roods trains on the broad and meter gauges is given in Table 5 below:-

TABLE 5
Incidence of collisions-taking passenger trains and goods trains (including other trains) separately

A- Number of train collisions
B- Incidence of train collisions per million passenger/goods train kilometers

Year	Passenger trains				Goods trains (including other trains)			
	Broad Gauge		Meter Gauge		Broad Gauge		Meter Gauge	
	A	B	A	B	A	B	A	B
1	2	3	4	5	6	7	8	9
1963-64	14	0.11	10	0.13	44	0.35	15	0.30
1964-65	13	0.114	13	0.17	41	0.33	16	0.31
1965-66	27	0.19	9	0.11	31	0.24	12	0.23
1966-67	18	0.12	2	0.02	33	0.25	14	0.27
1967-68	23	0.16	12	0.15	25	0.18	8	0.16
1968-69	19	0.12	4	0.05	17	0.11	7	0.12
1969-70	8	0.05	4	0.05	32	0.20	10	0.16
1970-71	19	0.12	6	0.07	29	0.19	5	0.05
1971-72	17	0.10	8	0.09	21	0.13	9	0.15
1972-73	15	0.09	6	0.07	29	0.18	8	0.14
1973-74	26	0.12	4	0.06	32	0.22	3	0.06
1974-75	24	0.16	5	0.08	28	0.18	9	0.18
1975-76	21	0.12	7	0.09	27	0.16	9	0.17
1976-77	17	0.09	5	0.06	21	0.12	2	0.04
1977-78	29	0.15	6	0.07	15	0.08	3	0.06

*Collisions involving a train carrying passengers is treated as a passenger train collision.

024 On the broad gauge, the incidence of collisions involving passenger trains fluctuated considerably during the last decade. The declining trend. from 1968-69 to 1972-73 got reversed during 1973-74 and 1974-75 when the incidence increased to 0.16 per million train kilometers, thus going back to the level obtaining in 1967-68. It then declined for two years to 0.09 in 1976-77 but again rose to 0.15 in 1977-78. In the case of goods trains on the broad gauge, after a general rising trend from 1968-69 to 1973-74, during which period the incidence increased from 0.11 to 0.22 per million train kilometers, there has been a steady decline in the incruence during the last five years and was 0.08 during 1976-78.

On the meter gauge the incidence of collision involving passenger trains registered a sharp decline during 1968-69, being 0.05 per million passenger train kilometers as compared to 0.15 in the previous year. During 1970-71 tin incidence rose to 0.07 and has remained almost static. thereafter. Collisions of goods trains on gauge have trend except for the two intervening years 1974-75 and 1975-76 when their incidence rose sharply.

025 **Derailments.—**The incidence of derailments on the broad and meter gauges per million passenger' goods train kilometers is given in Table and the trend is shown in Graph 4.

TABLE 6

Incidence of derailments on broad and meter gauge taking passenger trains and goods trains (including other trains) separately.

A-Number of derailments

B-Incidence per million passenger/ goods train kilometers.

Year	Passenger		Goods		Total	
	A	B	A	B	A	B
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Broad gauge-						
1963-64	56	0.41	567	4.4	623	2.3
1964-65	66	0.49	386	3.1	452	1.6
1965-66	68	0.48	318	2.4	386	1.3
1966-67	66	0.46	272	2.1	338	1.2
1967-68	73	0.50	295	2.0	368	1.2
1968-69	78	0.51	217	1.42	295	1.0
1969-70	61	0.39	251	1.57	312	1.0
1970-71	62	0.39	201	1.30	263	0.8
1971-72	57	0.35	211	1.33	268	0.8
1972-73	71	0.44	185	1.17	256	0.8
1973-74	56	0.36	191	1.31	247	0.8
1974-75	71	0.46	234	1.53	305	1.0

1975-76	82	0.78	259	1.52	341	1.0
1976-77	70	0.38	229	1.29	299	0.8
1977-78	88	0.45	227	1.26	315	0.8
Meter Gauge-						
1963-64	73	0.99	520	10.4	593	4.5
1964-65	64	0.83	441	8.6	505	3.7
1965-66	61	0.77	447	8.4	508	3.6
1966-67	67	0.82	396	7.6	463	3.3
1967-68	84	1.00	365	7.7	449	3.2
1968-69	51	0.62	296	4.91	347	2.4
1969-70	65	0.78	323	5.21	388	2.7
1970-71	49	0.58	290	4.93	339	2.4
1971-72	74	0.88	281	4.81	355	2.5
1972-73	49	0.59	242	4.27	291	2.1
1973-74	64	0.89	214	4.49	278	2.3
1974-75	74	1.13	269	5.50	343	3.0
1975-76	93	1.14	292	5.54	385	2.9
1976-77	67	0.80	232	4.20	299	2.1
1977-78	81	0.95	256	4.83	337	2.4

026 On the broad gauge, there was a reduction in the incidence of derailments in 1968-69 as compared to the previous year, after which it has remained almost static. Taking passenger and goods trains separately, we find that while the incidence of derailments of passenger trains has not shown much change, there has been considerable decline in the incidence of goods train derailments during the 10-year period of our study as compared to the position obtaining in the 5-year period ending 1967-68.

On the meter gauge, the incidence of derailments of passenger trains had recorded a general decline in the quinquenium 1968-69 to 1972-73, but during the subsequent 5-year period ending 1977-78 there was considerable deterioration in the position and the incidence per million passenger train kilometers has gone back to the level obtaining prior to 1967-68. In the case of goods trains on the meter gauge, there was a sharp drop in the incidence of derailments during 1968-69 to 4.91 as compared to 7.7 in the previous year; it has remained around that level since then.

027 **Accidents at level crossings.—** The number of accidents at manned and unmanned level crossings during the 10-year period ending 1977-78 together with those in the earlier quinquenium are given in Table 7.

TABLE 7

Incidence of accidents at manned and unmanned level crossings.

A-Number of level crossings, B-Number of accidents, C-Incidence of accidents per manned unmanned level crossing.

	Incidence of accidents at level crossings					
Year	Manned			Unmanned		
	A	B	C	A	B	C
1	2	3	4	5	6	7
1963-64						
1964-65	16,300	40	0.0025	26,085	88	0.0034
1965-66		(Average for 5 years- taken from part I Report of the wanchoo Committee)				
1966-67						
1967-68						
1968-69	14,603	40	0.0027	26,068	89	0.034
1969-70	14,662	36	0.0025	26,172	75	0.0029
1970-71	14,713	31	0.0021	26,491	90	0.0034
1971-72	14,682	38	0.0026	26,627	80	0.0030
1972-73	N.A.	43	..	N.A.	88	..
1973-74	14,805	34	0.0023	26,6345	91	0.0034
1974-75	14,746	44	0.0030	26,379	96	0.0036
1975-76	14,410	27	0.0019	26,757	78	0.0029
1976-77	14,208	23	0.0016	26,430	63	0.0024
1977-78	13,953	30	0.0022	26,638	63	0.0024

***Figures include 'D' class level crossing also.**

N.A.- denotes "not available".

028 We find that there has been, by and large, a downward trend in the incidence of accidents at both manned and unmanned level crossing during the 10-year period ending 1977-78. Since level crossing accidents account for 45 per cent of the fatalities in all accidents, the decline in their number is a healthy sign. During the 5-year period covered by the Wanchoo Committee, the average annual number of persons killed and injured in level crossing accidents was 45 and 169 respectively. As, against that, during the 10-year peri9d ending 1977-78 the average annual number of persons killed and injured had gone up to 93 and 229 respectively. This clearly shows that the fall in the incidence of level crossing accidents does not mean a reduction in the hazard to human life and limb' in these accidents. Since just less than half of the total deaths in railway accidents are accounted for by level crossing accidents, the gravity of these needs no further emphasis. We have made recommendations in this respect in Chapter IV of this report, but we would stress that this should be viewed as a matter of overriding urgency and action initiated accordingly.

029 **Fires in trains—** The number of accidents due to fires in trains and the incidence thereof correlated to density of traffic taken separately for passenger and goods trains is given in Table 8. The trend is shown in Graph 5.

TABLE 8

Incidence of fires on trains broad and meter gauges taking passenger trains and goods trains (including other trains) separately

A- Number

B- Incidence per million passenger/goods train kilometers.

	Passenger trains		Goods Trains		Total	
Gauge Year	**A**	**B**	**A**	**B**	**A**	**B**
Broad Gauge-						
1963-64	53	0.41	24	0.19	77	0.29
1964-65	15	0.11	6	0.05	21	0.08
1965-66	20	0.14	12	0.09	32	0.11
1966-67	26	0.18	8	0.06	34	0.11
1967-68	18	0.12	8	0.06	26	0.09
1968-69	35	0.23	3	0.02	38	0.12
1969-70	28	0.18	7	0.04	35	0.11
1970-71	7	0.04	2	0.01	9	0.03
1971-72	18	0.11	4	0.03	22	0.07
1972-73	13	0.08	8	0.05	21	0.07
1973-74	10	0.06	1	0.01	11	0.04
1974-75	16	0.10	3	0.02	19	0.06

1975-76	14	0.08	5	0.03	19	0.06
1976-77	12	0.07	Nil	..	12	0.03
1977-78	8	0.04	3	0.02	11	0.03
Meter Gauge-						
1963-64	26	0.35	9	0.18	35	0.26
1964-65	9	0.11	1	0.02	10	0.07
1965-66	10	0.11	Nil	..	10	0.07
1966-67	18	0.22	1	0.02	19	0.13
1967-68	15	0.18	1	0.02	16	0.11
1968-69	9	0.11	1	0.02	10	0.07
1969-70	10	0.12	Nil	..	10	0.07
1970-71	2	0.02	1	0.02	3	0.02
1971-72	Nil	..	Nil	..	Nil	..
1972-73	4	0.05	Nil	..	4	0.03
1973-74	1	0.01	Nil	..	1	0.01
1974-75	2	0.03	2	0.04	4	0.03
1975-76	5	0.06	3	0.06	8	0.06
1976-77	2	0.05	Nil	..	4	0.03
1977-78	3	0.04	Nil	..	3	0.02

030 The sudden drop in the incidence of fires in trains on both the: broad and meter gauges during 1970-71 as compared to the previous year was due to the revision in classification of accidents falling in this category, consequent to implementation of recommendation 324(iii) in Part II of the report of the Wanchoo Committee, whereby fires in diesel and electric. locomotives began to be treated as 'engine failures'. Thereafter the incidence of fires in trains on the broad gauge had increased. However, since 1974-75 there has been a declining trend. On the meter gauge, the incidence of fires increased during 1975-76 followed by a decline during the next two years.

Fires in trains during the period 1963-64 to 1967-68 resulted in 25.4 percent of the total number of deaths; the figure has now come down to 6.8 percent.

Group II accidents or failure of railway equipment:

031 Accidents due to failure of railway equipment under different categories are given in Table 9. The trend is depected in Graph 6.

TABLE 9
Number of accidents due to failure of railway equipment

Year	Failure of engine and rolling stock			Failure of permanent way	Failuree of overhead wires	Failure of signalling apparatus	Total
	Engines	Couplings and draft gear	Other rolling stock				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1963-64	2,292	1,413	298	173	Nil	*	4,176
1964-65	2,830	1,023	309	240	Nil	*	3,602
1965-66	1,970	840	333	205	Nil	*	3,348
1966-67	2,124	613	249	239	Nil	*	3,225
1967-68	2,042	549	212	194	Nil	*	2,997
1968-69	2,010	480	214	154	1	*	2,859
1969-70	2,049	394	208	166	Nil	*	2,817
1970-71	2,343	392	210	117	N.A.	*	3,062
1971-72	2,330	357	258	98	N.A.	*	3,043
1972-73	3,896	434	207	535	113	*	5,185
1973-74	4,815	323	191	560	193	*	6,082
1974-75	7,138	383	381	435	162	N.A.	8,499
1975-76	7,905	382	310	652	174	342	9,765
1976-77	5,493	621	300	1,013	120	309	7,856
1977-78	6,208	526	1,267	768	111	376	9,256

*Failure of signalling apparatus began to be classified as an accident under the head “Failure of Railway Equipment” (from the year 1974-75) consequent to the acceptance of the recommendation 324(v) in Part II report of the Wanchoo Committee

N.A. denotes information not available.

032 It is seen that engine failures had recorded a sharp increase in 1972-73 and the figure had more than doubled by 1975-76. The increase during 1972-73 was due to the revised classification of engine failures according to which a diesel or electric locomotive is considered to have failed if it causes a delay of 30 minutes or more to the train it is hauling (as against the earlier figure of 60 minutes or more). After a sharp drop in engine failure during 1976-77, their number again increased in 1977-78.

033 The declining trend in the number of failures of couplings and draft gear which had set in prior to the appointment of the Wanchoo Committee, continued till 1973-74 after which there has been an upward trend. In 1976-77 the number of such failures rose sharply to 621 as compared to 382 in the previous year. Though their number dropped to 526 in 1977-78, it is still quite high as compared to the position prevailing prior to 1976-77,

034 We find that failures of outer rolling stock such as failures of tyres, axles, wheels, brake apparatus, etc., which had been steadily declining till 1973-74 had doubled during 1974-75. This was followed by a decline in such failures during 1975-76 and 1976-77. However, during 1977-78 there was an abnormal increase in their number from 300 (in the previous year) to 1267. This sudden increase is disquieting and calls for investigation and action. From the break-up of 1267 failures of other rolling stock during 1977-78, we find that the Central and South-Eastern Railways accounted for 620 and 615 failures respectively, i.e., 97.5 per cent of the total. While surprisingly, no such failure was reported on the North-Eastern

Northeast Frontier and Southern Railways, only 2 such failures were reported on the Northern, 9 on the Western, 10 on the Eastern and 11 on the South-Central Railways. It appears that the figures reported by most of the Railways may not be correct and the reporting of such failures and compilation of statistics in this regard need to be thoroughly looked into.

035 Accidents due to failure of permanent way also increased sharply from 1972-73 onwards with a further increase in 1976-77. Failures of permanent way consist of broken rails, failures of tunnels, bridges, viaducts, culverts, etc., flooding of portions of permanent way and slips in cuttings or embankments. Broken rails constituted the majority of the permanent way failures and their number and incidence related to kilometerage of running track are given in Table 10 below: —

TABLE 10

Failures of permanent way

Year	Total number of accidents sue to failure of permanent way	Running track kilometers	Number of broken rails	Incidence of broken rails per 100 kilometers of running track
1968-69	154	70691	97	0.14
1969-70	166	71251	113	0.16
1970-71	117	71669	79	0.11
1971-72	98	73225	59	0.08
1972-73	535	73664	478	0.65
1973-74	560	74401	593	0.68
1974-75	435	74197	400	0.54
1975-76	652	74255	578	0.78
1976-77	1013	74839	916	1.22
1977-78	768	75012	682	0.91

036 We find that there was a sharp rise in the number of failures of permanent way during 1972-73. This was followed by a further jump in 1976-77, the increase being mainly due to increase in the number of broken rails. The incidence of broken rails per 100 kilometers of running track increased from 0.14 during 1968-69 to 1.22 during 1976-77. During 1977-78, the incidence stood at 0.91. The steep rise in the incidence during the last decade is a matter of concern and calls for corrective action. We have commented further on this while reviewing the progress of track renewals in Chapter IV (Permanent Way).

037 Failures of overhead wires has shown a general decline since 197374. Compilation of separate statistics of failure of signalling apparatus commenced only from 1975-76. No trend is discernible during this short period except that during 1977-78, there has been an increase in such failures as compared to the previous two years.

Group III or miscellaneous accidents

038 It will be seen from Annexure I that the declining trend in the incidence of miscellaneous accidents viz. trains running over obstructions, collisions involving light engines, trollies, derailments of light engines, fires at station, etc. which had commenced prior to the appointment of the Wanchoo Committee continued till 1971-72. This was followed by an increase in the incidence of such accidents during 1972-73 and 1973-74, after which there has again been a steady decline.

Group IV or indicative accidents.

039 The incidence of indicative accidents which include averted collisions, breach of block rules and disregard of signals by drivers per million train kilometers category wise is given in Table 11 below:—

040 It will be seen that there has been a general declining trend in the incidence of averted collisions, breach of block rules and disregard of signals by drivers.

041 The incidence of train partings on passenger and goods trains per 100 million vehicle/wagon kilometers respectively is given in Table 12 below:-

TABLE 11
Incidence of Group IV or indicative accidents
A- Number of accidents
B- Incidence per million train kilometers

Year	Category of indicative accident					
	Averted collisions		Breach of block rules		Drivers passing signals at danger	
	A	B	A	B	A	B
1	2	3	4	5	6	7
1963-64	63	0.15	82	0.20	126	0.30
1964-65	55	0.13	76	0.18	116	0.27
1965-66	45	0.10	58	0.13	108	.25
1966-67	46	0.10	56	0.13	93	0.21
1967-68	44	0.10	41	0.09	100	0.22
1968-69	31	0.07	46	0.10	68	0.15
1969-70	22	0.05	36	0.08	47	0.10
1970-71	24	0.05	34	0.07	59	0.13
1971-72	23	0.05	20	0.04	46	0.10
1972-73	13	0.03	17	0.04	46	0.10
1973-74	19	0.04	11	0.03	45	0.10
1974-75	16	0.04	16	0.04	36	0.08
1975-76	15	0.03	15	0.03	49	0.10
1976-77	10	0.02	4	0.01	25	0.05
1977-78	14	0.03	11	0.02	28	0.05

TABLE 12

Incidence of train partings on passenger and goods trains during the years 1968- 69 to 1977-78

A- Number of train partings

B- Incidence per 100 million vehicle/wagon kilometers

Year	Vehicle kilometers (in millions)	Passenger trains		Wagon kilometers (in millions)	Goods trains (including other trains)	
		A	B		A	B
1	2	3	4	5	6	7
1968-69	4,716	64	1.36	10,815	589	5.45
1969-70	4,899	33	0.67	11,310	557	4.92
1970-71	5,011	39	0.78	10,999	536	4.87
1971-72	5,202	36	0.69	11,248	552	4.91
1972-73	5,242	43	0.82	11,372	427	3.75
1973-74	4,918	27	0.55	10,371	334	3.22
1974-75	4,700	31	0.66	10,969	354	3.23
1975-76	5,458	6	0.11	12,184	591	4.85
1976-77	5,910	18	0.30	13,065	604	4.62
1977-78	6,187	12	0.19	13,299	516	3.88

042 The incidence of passenger train partings per 100 million vehicle kilometers has dropped considerably during the last 10 years. During 1977-78, the incidence was 0.19 as compared to 1.36 during 1968-69. There has been a fall in the incidence of -train partings on goods trains also, though not as marked as in the case of passenger trains. The incidence of goods train partings per 100 million wagon kilometers has drop-Ted from 5.45 in 1968-69 to 3.22 in 1973-74. The incidence had gone up for two years during 1975-76 and 1976-77; however, during 1977-78 it dropped to 3.88 as compared to 4.62 in the previous year.

043 **Conclusions:-** From the broad review of accidents as made in the 'foregoing paragraphs we find that there has been a general decline in the incidence of important accidents (Group I), miscellaneous accidents (Group III) and indicative accidents (Group IV) during the 10-year period from 1968-69 to 1977-78 as compared to the position obtaining in the 5-year period from 1963-64 to 1967-68 which was reviewed by the Wanchoo 'Committee. Group II 'accidents or failures of railway equip-ment, namely, locomotives, rolling stock, permanent way, etc., however, increased substantially during the said period. This demands immediate attention and action. We have made some recommendations in this regard in Chapter IV of this report. We also find that the years 1974-75 and 1975-76 stand out as two significantly bad years as far as accidents are concerned. During these years, the incidence of almost all categories of accidents increased sharply. This increase has been attributed by the Railway Board mainly to the general labour unrest

which culminated in the all-India railway strike in May 1974 and its after-effects. In the words of the Railway Board:

> *"This affected the maintenance of rolling stock, track and more particularly discipline among the railwaymen."*

This clearly brings out the importance of healthy industrial relations on the Railways for safe and efficient operation of trains. We will, however, make our recommendations on this aspect in the subsequent report after completing our study.

SERIOUS ACCIDENTS DURING THE YEARS 1968-69 TO 1977-78— CAUSES AND CONSEQUENCES

(CHAPTER: III / THE RAILWAY ACCIDENTS ENQUIRY COMMITTEE, 1978: SIKRI COMMITTEE 1978)

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044 In exercise of the powers conferred under section 84 of the Indian: Railways Act 1890 (9 of 1890), the Central Government (Ministry of Tourism and Civil Aviation) have framed rules captioned 'Statutory Investigations into Railway Accidents Rules-1973' for enquiry into 'serious. 'accidents', by the Additional Commissioners of Railway Safety. These rules were issued in implementation of recommendation 279. (ii) in Part IL of the report of the Wanchoo Committee by the Ministry of Tourism and Civil Aviation who exercise administrative control over, the Commission of _ Railway Safety. They superseded the related provisions contained in the: Railway Board's Notification of April 1966. According to these rules an inquiry into every 'serious accident' by the Additional Commissioner of Railway Safety is obligatory unless the Central Government has appointed a Commission of Inquiry to inquire into the accident under the Commission of Inquiry Act, 1952 (68 of 1952), or has appointed any other authority

to inquire into it and for that purpose has made all or any of the provisions of the said act applicable to that authority. For the purpose of this rule 'serious accident' has been termed as one involving a train carrying passengers which is attended with loss of human life or grievous hurt, as, defined in the Indian Penal Code, to a passenger or passengers in the train, or with serious damage to railway property of the value exceeding one lakh rupees.

045 Serious accidents of the above nature attract the attention of the public and press on a much wider scale than the other accidents. In fact, the safety of rail travel is apt to be judged from the frequency of such accidents. Accidents of this description have, therefore, been singled out for analysis separately and in this Chapter, we give the incidence, causes and consequences 'of such of the serious accidents as were inquired into by the Additional Commissioners of Railway Safety or a Commission of Inquiry from 1968-69 to 1977-78.

046 During the 10-year period from 1968-69 to 1977-78, there were 219 serious accidents on the Indian Railways. Out of these, in 218, statutory inquiries were held by officers of the Commission of Railway Safety end in one case* the inquiry was held by a Commission of Inquiry appointed under the Commissions of Inquiry Act, 1952. We find from the annual reports of the Commission of Railway Safety that during the period 1968-69 to 1976-77 there were another 17 serious accidents, inquiries into which were entrusted by the Additional Commissioners of Railway Safety to the Railway Administrations under sub-rule (5) of rule 2 of the ‘Statutory Investigation into Railway Accidents Rules, 1973’.

*Accident involving 13 Up Tezpur Express between Udalguri and Rowtabagan stations on Rangiya-Rangapara North section of Northeast Frontier Railway on 30-5-1977 85, Injured-106, Damage to railway property—Rs. 11.11 lakhs, Cause—Washing away of the Bridge by flash floods—An act of God).

047 Casualties and damage in serious accidents- A measure or the gravity of serious accidents is the relatively high proportion of casualties and damage to railway property which takes place in them. The extent of casualties and damage to railway property in serious accidents in comparison to those which took place in important accidents namely, collisions, derailments, fires in trains and accidents between trains and road vehicles at level crossings during the period 1968-69 to 1977-78 is given in Table 13 below-

TABLE 13

Casualties and damage to Railway property in serious accidents compared to those in all categories of important accidents (Group I)

		1968-69 to 1977-78			
Type of Accidents	**Total number of accidents**	**Casualties**			**Extent of loss due to damage to railway property (Rupees in lakhs)**
		Killed	**Injured**	**Total**	
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
(1) Important accidents, (Collision, derailments, fires in trains and accidents between trains and road vehicles at level crossings)	8,705	2,052	7,344	9,396	2,150
(2) * Serious accidents inquired into by the Additional Commissioners	219	1,068	3,429	4,497	449

of Railway Safety and the Commission of inquiry					
(3) Serious accidents falling under categories mentioned in item (1) above	197	1,008	4,216	4,216	446
(4) Percentage (3)/(1)x 100	2.3	49.1	44.9	44.9	20.7

*These include accidents like explosions, collisions of trains with infringing, hoarding signal ladder, accidents causing casualties due to passengers struck by a hoarding signal ladder, accidents with road vehicles alongside track, etc. which do not fall in the category of important accidents against item (1) above.

048 It will be seen that while serious accidents constituted only 2.3 per cent of the total number of important accidents (Group I), these accounted for 49.1 per cent of the total fatalities, 43.7 per cent of the injuries and 20.7 per cent of the loss due to damage to railway property in all categories of important accidents.

049 **Incidence of serious accidents-** The number of serious accidents which occurred annually from 1957-58 to 1977-78 is given in Table 14 below.

TABLE 14

Number of serious accidents from 1957-58 to 1977-78

Year	Number	Year	Number
1957-58	17	1968-69	18
1958-59	17	1969-70	16
1959-60	10	1970-71	20
1960-61	15	1971-72	17
1961-62	15	1972-73	14
Total	**74**	**Total**	**85**

1962-63	14		
1963-64	9	1973-74	21
1964-65	13	1974-75	20
1965-66	15	1975-76	25
1966-67	23	1976-77	24
1967-68	19	1977-78	24
Total	**79**	**Total**	**114**

The figures of serious accidents shown in Table 14 above against the years 1974-75 and thereafter, **do not include 20 serious accidents*** involving collisions between good/passenger trains and road vehicles at manned level crossings in which there was loss of life or grievous injury to the passengers in road vehicles and accidents involving collisions and derailments of goods trains in which there was loss of life or grievous injury to any person. Inquiries into these accidents were also conducted by the Additional Commissioners of Railway Safety pursuant to the implementation of Recommendation 270(i)—Part-II of the Report of the Wanchoo Committee. The above-mentioned 20 serious accidents have been excluded from the analysis of serious accidents in this Chapter to enable a proper comparison of the incidence of similar types of serious accidents.

***Yearly distribution of 20 serious accidents: 1974-75--5; 1975-76—5; 1976-77—6; 1977-78--4**

050 From Table 14 it will be seen that during the years 1973-74 to 1977-78 there was a general increase in the number of serious accidents as compared to the position in the earlier years.

051 The Kunzru and Wanchoo Committees had reviewed the incidence of serious accidents related to traffic density during the two quinquennia namely, 1957-62 (hereinafter referred to as Period I)

and 1963-68 (Period II) respectively. In Table 15 below, we have analyzed the corresponding position during the 10-year period since the appointment of the Wanchoo Committee, splitting this period into two 5-year periods, i.e. from 1968 to 1973 (Period III) and 1973 to 1978 (Period IV).

TABLE 15

Incidence of serious accidents correlated to traffic density.

Period	From-To	Total Number of serious accidents	Total train Kilometers during the period (in millions)	Incidence of serious accidents per million train kilometers
I	1957-62	74	1893.91	0.039
II	1963-64 to 1967-68	79	2169.72	0.036
III	1968-69 to 1972-73	85	2345.55	0.036
IV	1973-74 to 1977-78	114	2382.42	0.048

052 During Period IV there were 114 serious accidents as compared to 74, 79 and 85 serious accidents during Periods I, II and III respectively. There was thus an increase in the number of serious accidents during the last five-year period ending 1977-78. During the same period, the incidence of serious accidents per million train kilometers increased to 20.048 from 0.036 in the previous two Periods.

053 Correlation of serious accidents to important or Group I accidents.— The majority of serious accidents fall under the categories of important or Group I accidents namely collisions, derailments, accidents at level crossings and fires in trains. In the analysis of important accidents, made earlier in paragraphs 17 and 18 in Chapter

II we have seen that there was a general decline in the incidence of such accidents during the last 15 years. In Table 16, we have correlated the incidence of serious accidents which fall in the categories of important accidents to the total number of important accidents which occurred in each year.

TABLE 16

Correlation of serious accidents falling in important categories to total number of important or Group accidents.

Year	Total number of serious accidents	Total number of serious accidents falling in the categories of important accidents	Total number of important accidents	Percentage (3)/(4)x 100
(1)	(2)	(3)	(4)	(5)
1963-64	9	9	1642	0.55
1964-65	13	13	1279	1.02
1965-66	15	15	1200	1.25
1966-67	23	20	1090	1.83
1967-68	19	16	1105	1.45
1968-69	18	16	908	1.76
1969-70	16	12	963	1.25
1970-71	20	16	840	190
1971-72	17	14	864	1.62
1972-73	14	12	813	1.48
1973-74	21	19	782	2.43
1974-75	25	25	925	2.70
1975-76	30	28	964	290
1976-77	30	29	780	3.72
1977-78	28	26	866	3.00

054 We find that the incidence of serious accidents which fall in the categories of important accidents when taken as a proportion of the total number of important accidents has been

continuously rising even though the number of important accidents has been falling. This, *prima facie*, indicates that the consequences of such accidents are becoming more serious. We will advert to this in the subsequent report.

055 **Cause-wise analysis of serious accidents-** The detailed cause-wise incidence of serious accidents during the period 1968-69 to 1977-78 is given in Annexure III. The position obtaining in the earlier two quinquennia has been juxtaposed for ready comparison. The summarized position is shown in Table 17 below-

056 The analysis in Table 17 shows that: —

(i) The number of serious accidents due to failure of drivers; registered an increase of 50 per cent during Periods III and IV over those in the earlier two Periods.

(ii) Accidents due to failure of station staff, which decreased considerably during Period HI, again went up during Periods IV to the level obtaining prior to Period III.

(iii) There was a decrease in the incidence of serious accidents, attributable to train wrecking.

(iv) Accidents at level crossings due to failure of road-users increased sharply during Period IV as compared to the position: obtaining in the earlier three Periods.

(v) The incidence of serious accidents due to failure of locomotives went up during Period IV.

(vi) The incidence of serious accidents due to failure of rolling stock has been continuously rising since Period II. This is a disturbing trend and calls for urgent corrective action.

(vii) The incidence of serious accidents due to failure of track has also increased in recent years. From 3 serious accidents during Period H, their number increased to 5 and 8 during Periods III and IV.

(viii) There was a substantial increase in the incidence of serious accidents due to fires in trains during the last ten years. From 3 serious accidents in Period II, their number shot up, to 10 during Period III and to 12 during Period IV; and

(ix) Miscellaneous causes, namely faulty securing of consignments, failure of catenary, moving train hit by a gas cylinder which rolled down the platform and burst and other causes accounted for 14 and 12 serious accidents during Periods III and IV respectively as compared to 12 during Period II and 7 in Period I.

TABLE 17
Cause-wise analysis of serious accidents.

Sr. No.	Broad cause				
		Period I (1957- 62)	Period II (1963-68)	Period III (1968-73)	Period IV (1973-78)
(1)	(2)	(3)	(4)	(5)	(6)
(i)	Failure of drivers	(A) 22	21	31	34
		(B) 0.0116	0.0097	0.0132	0.0143
(ii)	Failure of station staff	(A) 18	13	3	15
		(B) 0.0095	0.0060	0.0013	0.0063
(iii)	Train wrecking	(A) 12	17	10	6
		(B) 0.0063	0.0078	0.0043	0.0025
(iv)	Accidents at level crossings due to:				
	(a) Failure of railway staff	(A) 1	Nil	1	Nil
		(B) 0.0005	..	0.0004	..
	(b) Failure of road users	(A) 3	5	2	9
		(B) 0.0016	0.0023	0.0009	0.0038
(v)	Failure of engines	(A) 2	1	1	3
		(B) 0.0011	10.0005	0.0004	0.0013
(vi)	Failure of rolling stock	(A) 3	2	8	10
		(B) 0.0016	0.0009	0.0034	0.0042
(vii)	Failure of track	(A) 4	3	5	8
		(B) 0.0021	0.0014	0.0021	0.0034
(viii)	Fires in trains	(A) 2	3	10	12
		(B) 0.0011	0.0014	0.0043	0.0050
(ix)	Miscellaneous cause (other than the above)	(A) 7	12	14	12
(x)	Causes not determined	(A) Nil	2	Nil	4
(xi)	Causes under consideration	(A) Nil	Nil	Nil	1
	Total	(A) 74	79	85	114
		(B) 0.039	0.036	0.036	0.048

057 Clubbing the causative factors of serious accidents into broad categories, the results are summarized in Table 18 below.

TABLE 18
Broad cause-wise analysis to serious accidents.
A- Number of accidents
B- 'A' taken as a percentage of total number of accidents.

Sr. No.	Broad causes	Period I		Period II		Period III		Period IV	
		1957-62		1963-64 to 1967-68		1968-69 to 1972-73		1973-74 to 1977-78	
		A	B	A	B	A	B	A	B
(i)	Failure of railway staff	41	55.4	34	43.0	35	41.2	49	43.0
(ii)	Failure of equipment	9	12.2	6	7.6	14	16.5	21	18.4
(iii)	Failure of road users	3	4.0	5	6.3	2	2.3	9	7.9
(iv)	Fires in trains	2	2.7	3	3.8	10	11.8	12	10.5
(v)	Miscellaneous	19	25.7	31	39.3	24	28.2	23	20.2
(vi)	**Total**	**74**	**100.0**	**79**	**100.0**	**85**	**100.0**	**114**	**100.0**

058 Failure of railway staff or human element was responsible for the largest number of serious accidents. The proportion of accidents attributable to human element has remained almost static, around 43 per cent. during the last three Periods. Failure of equipment, i.e., locomotives, rolling stock and track takes the next place after failure of railway staff in the last three quinquennia and the proportion of serious accidents due to these causes has steadily increased from 7.6 to 18.4 per cent.

059 **Consequences of serious accidents:-** Annexure IV gives the-casualties, injuries and loss due to damage to railway property in serious. accidents.

REVIEW OF THE IMPLEMENTATION OF RECOMMENDATIONS MADE BY THE WANCHOO COMMITTEE

(CHAPTER: IV / THE RAILWAY ACCIDENTS ENQUIRY COMMITTEE, 1978: SIKRI COMMITTEE 1978)

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060 The Wanchoo Committee had summarized their report (Parts I .and II) into observations and recommendations aggregating to 729. We have considered all these recommendations and observations. We have not commented on such of the recommendations as are either in the nature of mere observations or are factual or which have been clearly, fully or substantially implemented or where appropriate instructions hive been issued by the Railway Board. All these recommendations along with those which were not accepted by the Ministry of Railways are included in the Appendix to this report together with the views of the Railway Board and the action taken by them. We will go into these matters, where necessary, in the subsequent report. In this Chapter we give a -detailed review of the implementation of the remaining recommendations and observations of the Wanchoo Committee under the following heads: -

The Human Element
Training of Staff
Other Staff Matters
Permanent Way
Level Crossings
Signalling and Interlocking
Motive power
Goods and coaching stock
Research, Designs and Standards
Organization and Other Matters.

The Human Element

061 The review of serious accidents which we have made in Chapter III brings out that failure of railway staff is the causative factor for the largest number of serious accidents. In the category of important accidents we find that 95 to 100 per cent of the collisions and about two-thirds of the derailments were also due to failure of railway staff. This highlights the importance of the human element.

062 The Wanchoo Committee made 61 recommendations on the subject of human element. Out of these, items 132 of Part I and 10, 11, 12, 13, 29, 30(i) to (vi), 32 of Part II are mere observations and did not call for any action; items 130 of Part I, 20, 27, 31,, 35, 38. 39(i), (ii), 41, 42, 43 of Part II have been either implemented or appropriate action taken by the Railway Board and items 28, 33, 37(i) to (iii) of Part II were not accepted by the Railway Board. The aforesaid observations and recommendations together with the views of and action taken by the Railway Board are given in the Appendix to this report.

Our detailed review of the implementation of the remaining recommendations is contained in the following paragraphs.

063 Trade Unions— Recommendations 14, 15, 16, 17, 18, 19 and 21 (i), (iii)—Part III. The Wanchoo Committee recognized a dual role for trade unions, viz. mainly to protect the interests of staff and to strive for better working conditions for them; and also to inculcate duty-consciousness and a sense of discipline in the staff. They recommended and observed as follows: —

(i) there should be only one recognized employees' union on each Railway with a recognized federation at the apex and ways and means should be explored to achieve this.

(ii) the present system of allowing outsiders to hold offices in the unions left scope for non-railwaymen having political alignments with different political parties to gain control over the trade unions and direct the movement more with the aim of furthering their Political ends rather than in the interest of trade union movement. They felt that the trade unions should be managed by the railwaymen who should be able to provide leadership to the railway workers and represent them in negotiations with the Railway Administrations. This process would be facilitated and accelerated if the Railway Administrations created a sense of security among their employees who functioned as office-bearers.

(iii) the staff in the senior supervisory posts drawing gross emoluments of Rs. 500/- per month or above should not be allowed to become members of recognized trade unions. Such supervisory staff may be allowed to have a separate association on each

Railway with a federation at the apex which should receive due recognition of the Railway Administration and with some machinery in the nature of arbitration for solution of collective problems of such staff.

064 The Railway Board have stated that they had always sought the cooperation of recognized unions in increasing the element of safety in train operation and that it has been their consistent policy to strive for one organization of labour on the Railways, to encourage leadership of the unions by the railwaymen themselves and not to favour recognition of sectional unions. The Railway Board, however, did not consider it practicple to prohibit senior supervisors from becoming members of recognized unions on the consideration that encouraging senior supervisors to form a separate association would not benefit either the trade unions or the Railway Administration, and would in fact, be contrary to the 'spirit of the recommendations of the Wanchoo Committee themselves that there should be only one union on each Railway.

065 We note that matters relating to industrial relations are at present regulated, inter alia, by three Central enactments viz. Trade Unions Act, 1926, the Industrial Employment (Standing Orders) Act, 1946 and the Industrial Disputes Act, 1947. The National Commission on Labour (1969), which studied the Industrial Relations Practices and Procedures, found a number of 'shortcomings which had impeded the growth of industrial harmony. It came to the conclusion that it was essential to create a climate conducive to industrial harmony and foster proper attitudes in the minds of employees as well as

employers so that cooperative endeavour might promote rapid economic progress. The Commission made useful recommendation's concerning the scope and coverage of the laws, procedure' and machinery for speedy settlement of disputes and registration and recognition of unions. Recently, a 30-member Tripartite Committee on comprehensive Industrial Relations Laws and composition of Indian Labour Conference, which was set up by the. Central Government in pursuance of the recommendation of the Tripartite Labour Conference (May 1977), studied the existing laws and made recommendations regarding the broad framework of a comprehensive law on industrial relations. We understand that the Central Government propose to enact a new law on industrial relations.

066 Although the recommendations of the Wanchoo Committee referred to in paragraph 63 (i) and (ii) of this report were accepted in principle, it has not been possible for the Ministry of Railways to implement them. Recommendation in paragraph 63 (iii) was not accepted by the Ministry of Railways.

067 **Welfare Organization:—**

(Recommendations 22, 23, 24, 25 and 26—Part 11)—The Wanchoo Committee observed that "of the grievances which figured most among the cases of individuals sponsored by the trade unions in respect of station staff and of driving staff—the top three places are taken by (i) payment of arrears of pay, allowances, etc.; (ii) sanctioning of increments and (iii) confirmation or fixing of pay or seniority or promotion" in that order. They felt that the reason for resorting to representation through trade unions was due to the staff losing hope of getting their due through normal channels. They felt that the role played by the welfare organization in the

matter of removal of genuine grievances of staff had evidently been ineffective. While welcoming the working of some revitalized welfare bureaux in some of the divisions of the Railways, they had hoped that these would be taken as a model to be adopted or even improved upon by all divisions, and the time would Soon come when the staff all along the line would feel that if they had some grievance or difficulty, it was the Welfare Inspector to whom they should address it. The Wanchoo Committee recommended that orientation training should be imparted to Welfare Inspectors as would enable them to accomplish what their functional designation implies.

068 The Railway Board have advised that it is the constant endeavour of the Railway Administrations to remove the grievances of the nature mentioned by the Wanchoo Committee and that steps have been taken to make the welfare organizations on the Railways more effective. Enumerating the steps taken, they have 'stated that a machinery to redress grievances has been set up on all the Railways with a view to ensuring prompt disposal of staff grievances, the Railways have been instructed to hold monthly meetings at different levels with organized labour in order to exclusively discuss and settle cases of non-payment of dues, to have a nominated day each month for meeting the recognized unions to solve all outstanding problems at which the officers of the Accounts and Personnel departments could be present, to ensure that every Welfare Inspector has clearly assigned duties and responsibilities on the basis of which his performance could be judged, and to make arrangements for imparting orientation training to Welfare Inspectors.

069 The Wanchoo Committee observed that a properly managed personnel branch should be

able to take care of the grievances of staff so that they do not feel the need of channelizing their grievances through trade unions. Apparently, the measures spelt out by the Railway Board are primarily meant to sort out the problems with organized labour and trade unions. While the value of such measures is not denied, we are afraid that these measures alone would not achieve the objectives of the Wanchoo Committee, namely, building up of the credibility of the Railway Administration in the eyes of the employees in the matter of redressal of grievances so that the staff all along the line feel that for any grievance or difficulty it is the Welfare Inspector who should be addressed first.

070 The Railways have informed us that machinery exists on their systems, which is improved upon from time to time by introducing innovations to promptly redress grievances of staff. The South Central Railway has, however, stated that it is not possible for the Welfare Organization to produce results due to shortage of supporting clerical staff.

071 We find that a Staff Welfare Fortnight was conducted in February, 1977 at the instance of the Railway Board with a view to taking stock of the representations received from staff. During the fortnight, a total of over 1.2 lakh representations were received from staff details of which are given in Table 19 below:

TABLE 19
Representation received from staff during Staff Welfare Fortnight, February

S.N.	Type of representations	Number
1	Provident Fund advances	10,075
2	Advances for house building, conveyance, festival and pay	7,756
3	Reimbursements of tuition fees, medical charges, educational assistance	7,131
4	Grant of increments	18,200
5	Overtime claims	26,676
6	Arrears/fixation of pay	16,887
7	Travelling/running allowances, Dearness Allowance	3,789
8	Settlement dues on retirement/death	2,767
9	Grant of settlement passes	210
10	Others	26,549
	Total	**1,20,040**

072 The Railway Board have advised us that 80,000 cases out of 1,20,040 (67 per cent) were cleared in the 'Staff Welfare Fortnight'. The top three positions were occupied by overtime claims, increments and arrears/refixation of pay. It is understandable that in a huge organization like the Railways employing about 15 lakh regular employees and 3 lakh casual labour, grievances are bound to exist, especially having regard to the complicated rules and procedures. While the observance of such weeks/fortnights serves limited objectives and renders limited help, there it need for gearing up the machinery to ensure that staff representations are expeditiously attended to at all times.

073 We note that the Railway Board had issued instructions in 1972 for imparting orientation training to welfare inspectors. From the replies to the questionnaire, we find that some Railways are giving training to welfare inspectors while some are not. Personnel management is a specialized subject and welfare inspectors should be fully equipped for the same. We recommend that persons who are to work as welfare inspectors should be given proper training either before or within a specified period of taking up duties as welfare inspectors so that they have an idea of the background in which they have to function.

074 The question of the structure and functioning of the organization within a Railway Administration for redressing the grievances and difficulties of staff without undue delay is an important matter to which we will advert in the subsequent report.

075 Finalisation of accident enquiries and disciplinary action.- (Recommendations 133, 134—Part I and 34—Part II)—The Wanchoo Committee found that the time taken in the finalization of accident cases on some of the Railways was far beyond the target laid down by the Railway Board. They noticed that the interval of time between the date of finalization of accident inquiry and the acceptance of findings by competent authority was long. While accepting the present procedure of disciplinary action to be cumbersome and time-consuming, they found that the major portion of the delays was due to the incidental delays occurring in the departmental office itself.

They considered that there was scope for improvement if such delays were minimized.

076 The Railway Board have indicated that instructions exist to the effect that accident cases should be finalised, including imposition of penalty on the defaulting staff, if any, within an average of 90 days or the occurrence of the accident. The finalization of the accident cases is watched right up to the Railway Board through periodical returns which show the time taken at each stage of finalization of an accident. It helps the Railways to locate the bottlenecks and take remedial measures. The Railways are also required to give summarized position of the accidents finalised during each quarter giving the break-up of cases where major penalty/minor penalty/no penalty is imposed, indicating, inter alias, the number of cases finalised under each category, total time taken, and the average time taken to finalize accident cases. Since the time required for finalizing different types of cases is bound to vary widely, the Railway Board have recently laid down different parameters especially while assessing the performance of the Railways for the annual award of Railway Minister's Safety Shield-40 days from the date of accident for cases where no railway staff is held responsible 60 days when minor punishment is given, 90 days where major penalty charge sheet is issued but minor penalty is imposed and 150 days where major penalty is imposed.

077 The Railways have furnished information regarding the average time taken for finalization of accident cases during 1976-77 which is given in Table 20 below:—

TABLE 20

Railway	Average number of days taken for finalizing accident cases during 1976-77			
	Where no railway staff was held responsible	When no punishment was imposed	Where major penalty chargesheet was issued minor penalty was imposed	Where major penalty was imposed
Central	61	128.6	292.5	190.5
Eastern	101	208	404	335
Northen	NA	194*	NA	237*
North-Eastern	66	123	Nil	160
Northeast Frontier	75.4	120.5	165.6	236
Southern	85	130	186	159
Southern Central	56	141	287	274
South-Eastern	76	141	163	274
Western	NA	207@	NA	319@
Railway Boards target	40	60	90	150

078 It will be seen that the time taken by the Railways for finalization of accident cases exceeded in all cases the target laid down by the Railway Board. In respect of cases where minor or major penalties were imposed and also where major . penalty chargesheets were issued but minor penalties were imposed, the average time taken exceeded the target by a very wide margin. Thus, the recommendation made by the Wanchoo Committee remains substantially unimplemented. We would urge the Railway Board to take steps to ensure that the causes of delay in finalizing accident cases are identified and remedial measures taken to achieve the target laid down by themselves.

079 **Morale of supervisors—** (Recommendations 126✓Part I and 36 ( ) to (vi) —Part 1I)—The Wanchoo Committee expressed the view that senior supervisors should be recognized as junior members of management with a view to restoring their position and authority in the interest of efficient and successful running of administration. They gave the following suggestions: —

(i) it is desirable that senior supervisors should always be consulted in regard to promotions and transfers of staff in their charge and conditions should be created whereby it becomes known to the staff right down the line that the action taken by the supervisors on the spot will ordinarily receive the support of the administration.

(ii) the number of grades of senior supervisors should be reduced. As far as possible, most of the grades

of senior supervisors should be selection grades. The grades should be so devised that the top of one grade is well below the starting point of the next grade so that when a person is promoted to the next grade there is substantial rise in emoluments. As an interim measure, the top-most grades of senior supervisors should be appropriately raised keeping in view the present-day conditions as also the scale of senior supervisors in comparable posts elsewhere.

(iii) wherever there is a large concentration of staff, say 300 to 500 men, working under a senior supervisor, the post should be upgraded to class II gazetted status. The implication of this scheme should be worked out by the Railway Administrations. Special care should be taken in selecting the right type of men whenever it is decided to upgrade posts of senior supervisors to Class IL The present designation may be retained or, if necessary, revised as Yard Superintendent, Shop Superintendent. Loco Superintendent, Station Superintendent, etc.

080 The Railway Board have stated that they agree with the view that senior supervisors are junior members of management. In regard to promotions and transfers of staff, they have informed us that the confidential reports written by the supervisory staff for employees working under them are invariably taken into account in assessing their suitability for promotion. The views of senior supervisors are also considered in cases of transfers, wherever possible. In their comments the Railways have expressed divergent opinions

on the above views of the Railway Board. This recommendation of the Wanchoo Committee does not appear to have been fully implemented.

081 Regarding reduction, in the number of grades of senior supervisors, the Railway Board have advised that the Third Central Pay Commission, 1973, after having examined all factors such as qualifications, nature of duties performed, degree of supervision exercised and avenues of promotion available for each category, have recommended revised pay scales which are comparable to the grades of similar staff in other Government departments. They have stated that some of the important safety categories of staff including Chief Controllers, Loco Foremen, Loco Inspectors, Technical Supervisors in diesel and electric loco sheds, etc. have already been given the higher 'pay scale of Rs. 840-1040 and the allotment of this scale for other safety categories of staff like permanent, way inspectors, signal inspectors, etc. was also under consideration.

082 The Railway Board have not commented on the multiplicity and the overlapping of grades of supervisors. We, however, note that this aspect was considered by the Third Central. Pay Commission-1973, who had expressed the view that a reduction in the number of scales had been attempted by broad-banding the scales but to the extent which would neither create difficulty for the department nor would give rise to discontentment among large sections of employees. The Pay Commission further observed that the scope for avoiding overlapping scales was restricted by the need of avoiding multiplicity of pay scales. Accordingly, though the

Pay Commission continued the existing system of overlapping scales, they tried to reduce the period of overlapping with a view to providing incentives to employees for getting promoted to higher grades.

083 We consider that it would be difficult to evolves of pay which do not overlap at all. In any case, such a position does not ordinarily obtain in any department of the Government or in public sector undertaking. We, however, note that, to the extent the idea behind this recommendation could be accepted, action has already been taken within the framework of the recommendations of the Third Central Pay Commission.

084 Regarding the upgradation of posts of senior supervisors to Class. II gazetted status, the Railway Board did not accept the basis for upgradation as recommended by the Wanchoo Committee. They have informed us that it has been decided to upgrade certain Grade 'C' posts in the-highest supervisory scale of Rs. 840-1040/700-900 in departments other than Accounts and Cash and Pay, Rs. 500-900 in Accounts department and Rs. 700-900 in Cash and Pay department to Group '13' class II gazetted status. Accordingly, 47 posts of Station Superintendents/ Chief Yard Masters and 450 posts in various other departments have been upgraded to class II gazetted status on the Indian Railways, In view of what has been stated above, we feel that the recommendation has been substantially implemented to the extent it was accepted by the Railway Board.

085 **Officer-staff and supervisor-staff ratio:-** Recommendations 40—Part II)- The Wanchoo Committee observed that there was a general awareness in the Railways of the problem of officer-staff and supervisor-- staff ratios and the inadequacy of the present ratios. They, however, left it to the Railway Board and the Railway Administrations to work out appropriate ratios between the officers and the staff, after proper scientific study. They expressed the view that, to improve the ratios, the matter. would have to be tackled from both ends, that is to strengthen the number of officers and supervisors wherever required on the one hand and to make suitable adjustment in the number of men in the various wings on-the other.

086 **Officer-staff Ratio:—** The Railway Board agreed that there was clearly a case for betterment of the officer-staff ratio, consistent with the technological changes and development that are taking place on the Railways. They stated that this question would be kept under examination from time to time to ensure necessary improvement in the ratio, keeping in view the pace of technological development and growth and organizational requirements.

087 The Railway Board directed the Efficiency Bureau in November 1973 to conduct a study for evolving revised norms and identify areas where restructuring of cadres on short and long-term basis was necessary. In their study, the Efficiency Bureau brought out the officer-staff ratios as obtaining on the. Railways in

1952-53, 1962-63 and 1972-73 which have been supplemented by those obtaining in 1976-77 on the basis of the information in respect of officers and staff extracted from Statement Number 40—III of the Supplement to the Indian Railways Annual Report and Accounts for 1976-77 and are shown in Table 21. The position obtaining in the other Government departments and Public Sector undertakings has also been shown for ready comparison.

TABLE 21

Department	Officer -staff ratio as on			
	31-3-53	31-3-63	31-3-73	31-3-77
Administration	1:33	1:36	1:71	1:49
Accounts	1:104	1:78	1:66	1:56
Civil Engineering	1:386	1:206	1:206	1:216
Signal & Telecommunication	..	1:103	1:120	1:120
Transportation	1:419	1:385	1:437	1:420
Commercial	1:477	1:312	1:257	1:245
Mechanical Engineering	1:763	1:550	1:526	1:594
Stores	1:140	1:100	1:112	1:115
Electrical Engineering	1:248	1:140	1:201	1:205
Medical	1:202	1:119	1:21	1:22
Railway Protection force	1:1296	1:358	1:427	1:366
Over-all Ratio	..	..	1:178	1:178
Over-all Ratio (excluding Medical and Railway Protection Force department)	..	..	1:234	1:234
Posts & Telegraph	..	..	1:96	..

Department				
Central Public works Department	..		1:10	..
Military Engineering Service	..	..	1:21	..
Indian Oil Corporation	..	..	1:8	..
Bharat Heavy Electricals Limited	..	..	1:13	..
Hindustan Steel Limited	..	..	1:17	..
Air India	..	..	1:6	..
Indian Airlines			1:13	

088 It will be seen that the over-all ratio between officers and staff covering all departments o1 the Railways is 1:178 since 1973 and if the Medical and Railway Protection Force departments are excluded, since their set-up is different and does not follow the pattern obtaining in other departments, the overall ratio between officers and staff is 1:234. The major departments concerned with safety of rail travel are the Transportation, Civil, Mechanical, Electrical and Signal and Telecommunication Engineering. We find that, in all these departments, as well as the Stores department there has been deterioration in the officer-staff ratio as compared to the position obtaining in 1962-63. A slight improvement in this regard has, however, taken place in the Accounts and Commercial departments.

089 Efficiency Bureau study concludes that the Railways are under-officered as compared to other government departments and public sector undertakings. In the Posts and Telegraphs Department, where the ratio is the highest among all departments and public sector undertakings for which information was gathered by the Efficiency Bureau, the officer-staff ratio is 1:96. The study further concluded that no definite conclusions can be drawn from this since conditions of working in various departments and public sector undertakings may be different from those obtaining on the Railways.. The Railway Board decided in 1975 that the results of the study would be borne in mind while formulating the proposals for cadre restructuring.

090 As the figures for 1976-77 show, there is no improvement in the officer-staff ratio and the position in this regard in the major departments concerned with safety of rail travel, namely, Transportation, Civil, Mechanical, Electrical and Signal and Telecommunication Engineering has in fact deteriorated as compared to the position obtaining in 1962-63. The Wanchoo Committee's recommendation, therefore, remains unimplemented. We would urge the Railway Board to take urgent action to bring about an improvement in the officer-staff ratio.

091 **Supervisor-Staff Ratio:—** The Railway Board have not commented on the supervisor-staff ratio which is equally important to ensure personal contact and continuous communication between the management and men, specially when, in the words of the Kunzru Committee, supervisors

constitute the backbone of the Railway Administration and, in the words of the Wanchoo. Committee, they are the junior members of the management. The Efficiency Bureau of the Railway Board have also conducted a study in respect of the supervisor-staff ratio on the basis of data furnished by the Railways. The supervisor-staff ratio in the different departments of the Railways and also as compared to that in other Government departments is shown in Table 22 below:

TABLE 22

Supervisor -Staff ratio

Supervisor ratio in different departments of the Railways as on 31-3-1973		Supervisor-staff ratio in other Government departments and public sector undertakings as on 13-3-1973	
Administration	1:11	Posts & Telegraph Department*	1:8
Accounts	1:7	*(Position as on 31-3-72. Does not include extra departmental staff. Industrial workers and Audit and Accounts staff)	
Civil Engineering	1:32		
Signal & Telecommunication Engineering	1:12		
Supervisor-staff ratio in different departments of the		Supervisor-staff ratio in other Government departments and	

Railways as on 31-3-1973		public sector undertakings as on 13-3-1973	
Transportation	1:19		
Commercial	1:22	Central public works department	1:12
Mechanical Engineering	1:20	Military Engineering Service	-
Stores	1:18	(Ministry of Defence)	1:20
Electrical Engineering	1:15	Indian Oil Corporation	1:13
Medical	1:44	Bharat Heavy Electricals Ltd.	1:11
Railway Protection Force	1:18	Hindustan Steel Ltd.	1:6
Over-all Ratio-Railways	1:20	Air India	1:4
Overall ratio excluding Medical and Railway Protection Force departments	1:19	Indian Airlines	1:5
		Railways	1:20

093 The study of the Efficiency Bureau concludes that the ratio of 1:20 between the supervisors and staff is quite satisfactory. We, however, find that this study suffers from a number of deficiencies, some of which are enumerated below: —

(i) the Efficiency Bureau did not prescribe the categories of staff which should be treated as supervisory and non-supervisory. There is a wide disparity in the classification of different categories

of Staff as supervisory and non-supervisory, according to the data furnished by various Railways. Some posts have been treated as supervisory on some. Railways and non-supervisory on the others. For instance, Station Masters (grade 250-380) have been treated as supervisory on the Central, Eastern, South Central and South-Eastern Railways and non-supervisory on the North-Eastern, Northeast Frontier and Western Railways; Assistant Station Masters (grade 250-380) have been treated as supervisory on the Central, South-Eastern and Western Railways and non-supervisory on the Eastern, North-Eastern, Northeast Frontier and South Central Railways; Train Examiners (grade 205-280) have been treated as supervisory on the North-Eastern, Southern and South Central Railways and non-supervisory on the Northeast Frontier Railway; Permanent Way Mistries have been treated as supervisory on the Central and South Central Railways and non-supervisory on the North-Eastern, Northeast Frontier, South-Eastern and Western Railways, etc.;

(ii) some of the categories of staff which appear to be supervisory have been treated as non-supervisory by some of the Railways. These are, for instance, area inspector on the South-Central Railway, inspector of works on the Northeast Frontier Railway, transportation and commercial inspector on the South-Eastern. Railway, platform supervisor on the South. Central Railway, chargeman on the South Central and South-Eastern Railways, yard

supervisor on the South Central and South. Eastern Railways, etc.; and

(iii) some of the categories of staff which appear to be non-supervisory have been treated as supervisory by some of the Railways e.g., confidential assistant on the South Central, South-Eastern and Eastern Railways; confidential stenographer on the North-Eastern Railway, signal and telecommunication maintained on the Eastern Railway and law assistant on the Central Railway, etc.

093 The categories of staff which should be treated as supervisory for the determination of supervisor-staff ratio have not been defined, as has been (lone for some other purposes. For instance, under sub-section (v) of clause (c) of section 71A of the Indian Railways Act, 1890, the Government are empowered to specify the railway staff who shall be treated as supervisory staff. Similarly, for the purposes of schedule of disciplinary powers, staff in the scale Rs. 250380(AS) (Rs. 425-700 Revised) and above have also been specified as senior supervisors. We feel that it is necessary to have a clear definition of the term 'supervisor' before determining the ratio of supervisors to staff. Having clearly identified supervisory staff, it would be necessary to take immediate steps to arrive at a rational supervisor-staff ratio and we recommend accordingly.

094 Psycho-Technical Ce11.— (Recommendations 129—Part I and 44(ii), (iii), 58—Part ID—The Wanchoo Committee observed that eves with the highly limited objectives which the Psycho-Technical Cell in the Railway Board had set for itself, the progress which it had made till then bad been insignificant. They commented as follows:

(i) the investigations conducted by the Psycho-Technical Cell were still in an experimental stage and if the value of psycho-technology as a means to promote safety in train operation was recognized by the Railway Board, everything possible would need to be done to accelerate the process. They hoped that the application of these tests will be handled by well-qualified and responsible staff so that they do not become a mere routine or a source of harassment to the staff.

(ii) the scope of such studies should be enlarged so that it was not confined to merely building up of some aptitude tests but encompassed the broader problems of socio-psychological make-up of the railway workers and of human engineering which have particular reference to rational and safe working on the Railways; and

(iii) aptitude tests which had been evolved or were in the process of being evolved by the Psycho-Technical Cell should, in the first instance, be applied to the categories of electric and diesel locomotive drivers before selection or recruitment.

095 In their remarks the Railway Board have stated that, in pursuance of the recommendations of the Kunzru Committee, a nucleus Psycho-Technical Cell was set up in 1964 on a limited scale to undertake research and evolve psycho-technical tests for key operating categories of staff. This Cell was made a part of the Traffic Research Directorate of the RDSO in February 1970. The Railway Board have advised us that psycho-technical tests for drivers/levermen/cabinmen/assistant station master's etc. were developed and validated with the express object of identifying the staff who had accident-prone predisposition. Instructions were issued to the Railway Service Commissions in September 1972 for applying these tests to open market recruits, as a result of which, all direct recruits to the categories of assistant station masters/apprentice firemen/assistant drivers are now being subjected to psycho-technical tests before being recruited. Earlier, in July 1971, instructions were issued to the Railways that 'in-service' psychological testing should be introduced for the purposes of selection and promotion of staff in operating categories. As regards the application of aptitude tests to categories of electric and diesel locomotive drivers, the Railway Board have stated that this has been implemented in the case of initial recruitment and the matter of 'in-service' testing is under consideration. The Railway Board have also stated that, besides the development of aptitude tests, the psycho-technical cell has successfully concluded certain other projects which are directed towards ensuring operational safety and efficiency. Having regard to the magnitude and the 'pioneering character' of the work, the approach has to

be cautious and, therefore, the pace of the progress has necessarily to be slow in the initial stages.

096 We note that, consequent to the instructions issued by the Railway Board in September 1972, psychological tests have been applied by the Railway Service Commissions to new recruits in some categories of operating staff. From the information furnished by the RDSO, the number of candidates exposed to such tests annually since 1971 together with the number of posts filled are shown in Table 23.

TABLE 23

Number of candidates expose to psychological tests at various Railway Service Commissions

Year	Category	Number tested	Approximate number of posts filled
1971	Assistant Station Masters	511	225
1972	”	102	25
1973	”	1317	875
1974	”	495	100
	Motormen	392	30
1975	Assistant Station Masters	1560	375
	Motormen	34	10
1976 (up to end of July)	Assistant Station Masters	4058	650
Total		**10469**	**2290**

The figures show that .so far psychological tests have been applied at the’ time of initial recruitment in the categories of

assistant station masters and motormen only. We fail to understand how the Railway Board have stated that psychological tests have been applied in the case of initial recruitm6nt in the categories of electric and diesel locomotive drivers when there has been no direct recruitment in these categories at any time.

097 In their directive of July, 1971 the Railway Board instructed the Railways to introduce 'in-service' psychological testing in the operating categories namely, station masters, assistant station masters, levermen, cabinmen, switchmen, drivers, assistant drivers and firemen as soon as the Railways and RDSO were able to make arrangements for such tests. These instructions also stipulated the stage at which psychological tests were to be administered at the time of promotion/selection for different categories. A beginning in this direction could not be made till 1976 for want of the requisite field organization on all the Railways and divisions. In the meanwhile some problems in the 'in-service' psychological testing of staff also-came to light. The question arose as to what should be done to the staff" if they fail in 'in-service' psycho-technical tests and whether they should be treated as medically decategorized and debarred from working in the category. On this issue the Railway Board decided that, basically, if the nature of the job and its requirements remain the same, the personality and aptitude tests need not be repeated if an individual has been found suitable once for it. This decision meant a basic departure from the earlier instructions issued in July 1971 tm,' the Railway Board and necessitated a fresh look, not only 'at the stages at which the tests have to be administered but also other implications arising out of the application of these

tests. In February 1976, the RDSO were instructed that the implications of Railway Board's directive of July 1971 for 'in-service' testing should be examined and the applicability of programme of the aptitude tests for promotional stages should be determined afresh. They were also directed that changes required, if any, in the rules for recruitment and promotion consequent upon the application of these tests, should be examined and modifications suggested with a view to ensure that the administration of aptitude tests should form part of the conditions of service for recruitment and promotion to those categories in which such tests are prescribed.

098 The RDSO examined the entire question of 'in-service' psycho-technical tests and submitted their report to the Railway Board in September 1976. As a departure from the earlier directive of the Railway Board issued in July 1961, the RDSO suggested as under: —

(i) psycho-technical tests should be applied while selecting cleaners from khalasis, both on the steam side as well as diesel side. If an employee is found fit at the stage of selection as cleaner he should go up to the stage of second fireman, first fireman, driver grade V, driver grade `B" and driver grade 'A' etc., on the steam side as well as on the diesel/electric side as assistant driver, driver grade CC', driver grade '13' and driver grade `A' etc., without the necessity of any further psycho-technical tests.

(ii) in the case of conversion training of staff from steam side to either diesel or electric side, psycho-technical tests should be held only at the

stage of conversion of first fireman as assistant driver (diesel/electric) and no further tests would be applied at the time of promotion as driver grade 'C' (disel/electric) or even subsequent stages.

(iii) psycho-technical tests should be administered for selection as leverman grade II from amongst the porters etc.

099 The above recommendations of RDSO were considered by the Railway Board and also discussed with the representatives of the staff at the meeting of the committee of Departmental Council (Joint Consultative Machinery) Railways held in November, 1978. It was decided by the Railway Board that psycho-technical tests would be applied at the stages of intake of engine cleaners and selection of pointsmen grade II/levermen gre.de II. Instructions in this regard were issued to the Railways in April, 1979 and they were advised that those of the khalasis who fail in the test for engine cleaners would be diverted to the maintenance side in the loco shed and those who fail in the test for pointsmen/levermen would, if otherwise eligible, be considered for promotion as brakesmen, number takers etc. and to the clerical categories.

100 From the foregoing, it will be seen that it has taken almost 8 years for the Railways to finalize the stages at which in-service' psychotechnical tests are to be administered in the case of some operating categories. No decision appears to have been taken so far for the application of psycho-technical tests at the time of conversion training of staff from steam to either diesel or electric traction. The RDSO have advised us that a

broad review of the field performance of the staff initially selected on the basis of aptitude tests indicates that the basic objectives in applying psychological methods to improve safety on the Indian Railways are in fact being achieved. They have added that, in the light of experience as above; the time has come for expeditious implementation of the programme of aptitude testing in respect of 'in-service' personnel so that the full benefits of the programme are derived and all the sensitive categories of staff in service are duly exposed to psychological screening. We would Urge the Railway Board that the decisions now taken for 'in-service' application of psycho-technical tests to categories of staff should be implemented without further delay. It is also necessary that the stages for 'in-service' psycho-technical testing in the case of remaining categories of staff directly connected with the safe running of trains are also prescribed at the earliest.

101 Labour Science Research:- (Recommendation 44(i), (iv) and (v) Part 11)—The Wanchoo Committee considered that, in a vast organization like the Railways which employs more than a million workers, labour science research would not be a mere refinement or a needless sophistry but an organ of considerable practical utility. They noted that the Japanese National Railways had been devoting a good deal of attention to the problem of correlation between man and machinery which had come to the fore with the" introduction of modern techniques. They commended for consideration of the Railway Board that the fields of investigation which the Japanese Railway Labour Science Research Institute and similar institutes in other advanced

countries have undertaken may be ascertained and thereafter and integrated programme of socio-psychological study and research may be drawn up. They felt that Universities, other Institutions and Foundations in the country which may be engaged in pursuits of this nature may be in a position to aid the Railways in such studies.

102 The Railway Board agreed in principle to widen the scope of activities of the Psycho-Technical Cell and eventually set up a programme of labour science research on the Indian Railways. In this regard the RDSO has advised us that they sought information on different aspects of labour science research from those foreign railways who have adopted psy-cho-technology and labour science research. They have advised us that, based on the replies received from the foreign railways and a broad survey of the human factors/problems relevant to traffic safety on the Indian, Railways, a detailed proposal for the reorganization of the psycho-technical cell, indicating, inter alia, the specific projects to be handled within an inter-disciplinary framework covering aptitude testing of staff, human engineering, socio psychological and psycho-medical problems and the essential complement-of technical staff needed to undertake the work was drawn up and sent to the Railway Board in June 1972. The Railway Board, however, sanctioned additional posts only for accelerating the process of application of aptitude. tests. The sanctioned strength of the reorganized psycho-technical cell in the RDSO increased from 3 to 5 officers in early 1973 but the cell had: to practically function with half of its sanctioned 'strength all these years because of non-filling of these posts. The RDSO has further stated that, inspite of the Psycho-Technical Cell

being under-staffed, it has made' studies in new areas suggested by the Wanchoo Committee, viz evaluation, of fatigue caused to drivers due to operation of vigilance control devices; effect of waiting duty on goods train drivers and assessment of fatigue. caused to drivers working nominated mail express trains at various sanctioned speeds. In addition, studies on the incidence of diabetes and its adverse consequences on the staff involved in train operations is in progress-in collaboration with the Medical Department. Efforts are continuing to build up' required laboratory facilities for human engineering studies.

103 The RDSO has informed us that the Psycho-Technical Cell had sought collaboration of the Central Labour Institute, Bombay on two specific projects. One of the studies related to the observation made by the Wanchoo Committee that the incidence of disregard of signals appeared to be high amongst drivers using spectacles. Verification of this observation by the Psycho-Technical Cell revealed that the higher incidence of disregard of signals amongst drivers using spectacles was statistically significant and was not due to chance. Since the Psycho-Technical Cell had, no medical: personnel for a clinical assessment of the problems to understand causes, this project was formed out to the Central Labour Institute, Bombay in December 1970. Despite all the assistance given to the Institute by the RDSO, they took about four years to submit a preliminary report which did not contain any useful conclusions. Subsequently, this study was done by the RDSO with the assistance of Railway Medical Officers.

104 On The second project pertained to the training of safety counsellors in counselling techniques in which the collaboration of the Industrial Psychology Division of the Central Labour Institute, Bombay, was found to be useful. This helped the Psycho-Technical Cell to develop' expertise of its own to carry on the work independently.

105 On the utility of such joint ventures, the RDSO has remarked that the problems required to be studied by the Psycho-Technical Cell are of applied nature, calling for intimate knowledge of railway working and necessary expertise has to be built up within the organization itself if purposeful research activities are to be pursued. Only limited collaboration with outside technical institutions in areas like training, test development etc., which are more in the nature of general professional services or are of a basic or fundamental nature can be useful.

106 From the foregoing we find that, even though the Railway Board had agreed in principle to widen the scope of activities of the Psycho-Technical Cell, not much progress has been made in this direction due to inadequacy of staff. Thus, the Wanchoo Committee's recommendation for extending the scope of labour science research on the Indian Railways remains substantially unimplemented. We will go into this further and advert to it in the subsequent report.

107 **Prosecution of Railway Staff involved in accident:—**Recommendation 135, 136—Part 1)—The Wanchoo Committee considered that it would be advantageous if a provision was made in Section 101 of the Indian Railways Act, 1890 to the effect that no court shall take cognizance of an offence under this section and the cognate sections of the Indian Penal Code without the sanction of the authority who was entitled to remove the railway servant from office. Such authority would be in the best position to determine whether there should be a prosecution and if so, who should be prosecuted. Where the police authorities felt that the competent authority was withholding sanction wrongly, they could always approach the Ministry of Railways for getting the necessary sanction. They further observed that in most accident cases departmental action would meet the ends of justice and prosecution of railway staff would be necessary only in comparatively few cases of a serious nature.

108 The Railway Board initially accepted this recommendation and sought the views of the Ministry of Home Affairs which did not agree to shut out prosecution of railway staff, without the sanction of the competent railway authority, as provided for in the Indian Railways Act, 1890. It may be mentioned that Section 101 of the said Act provides for imposition of imprisonment, fine or both, on a railway servant who endangers the life of any person by disobedience of any general rule or other rule or order or by any rash or negligent act or omission. The Ministry of Home Affairs did not agree to the proposal since the reaction of a number of

State Governments was not favourable and since this would lead to similar demands from various other categories of Central and State Government employees as well as organized sections of labour in other undertakings. This would also involve amendment of cognate sections 304A, 336, 337 and 338 of the Indian Penal Code which deal with causing of death or hurt and endangering of life and personal safety of others due to negligence. They felt that the objective of prosecuting the right persons could be achieved by ensuring stricter coordination between the police and railway authorities and that the problem was more administrative than legal, and ways and means could be found to provide proper administrative coordination. They opined that it was open to the railway authorities to take departmental action against staff for negligence even where the prosecution fails and considered that, if any prosecution for rash or negligent act involving the safety of railway passengers is made subject to the sanction of that very administration, the pressure of organized employees may build up which may result in hesitation at various levels of administration in giving sanction for the prosecution. This would encourage employees to be rash and negligent.

109 In the light of the views of the Ministry of Home Affairs, the Railway Board did not consider it advisable to proceed with the proposed legislation of debarring prosecution of railway staff without sanction of the competent railway authority.

110 On the necessity of obtaining the sanction of the competent authority on the Railways before prosecution is launched by police authorities, the Railways have expressed the view that, in most cases, departmental action proves adequate and deterrent and prosecution should be launched only in such cases where departmental action alone may not meet the ends of justice.

111 We find that during the years 1968-69 to 1977-78, 214 railway employees were prosecuted: for causing accidents out of which only 34 got convicted. The figures show that the problem is not of any significant magnitude. We also find that, in some States there are rules which provide for sanction to be obtained at an appreciably higher level in the police hierarchy before prosecution is launched. This was meant to avoid capricious prosecution of staff. In view of the above and having regard to the views expressed by the Ministry of Home Affairs and the State Governments, we feel that there is no necessity to pursue the matter further.

Training Of Staff

112 In keeping with the times, the Railways have introduced/extended the use of modern sophisticated equipment in various fields of railway operation viz., signalling, motive power, permanent way, etc. It is imperative that the staff entrusted with the responsibility of handling, operation and maintenance of all such equipments are imparted adequate and intensive training. The Wanchoo Committee made 49 recommendations on varying subjects pertaining to training

of staff. Out of these items 107 to 113, 122 to 125 and 128 of. Part I and 45 to 47, 53, 55, 57 and 67 to 70-Part II have been either implemented or the Railway Board have issued appropriate instructions in each case. The aforesaid recommendations, together with the views/action taken as advised to us by the Railway Board, are given in the Appendix to this report. Our detailed review of the remaining recommendations is contained in the following paragraphs.

113 Training of Signalling staff.—(Recommendations 48, 49—Part II)- The Wanchoo Committee observed that modern signalling techniques require highly intelligent, technically qualified and thoroughly trained staff for handling and operation of the equipment. They did not approve the practice in vogue on the Railways by which a small number of staff who were associated with the installation of the equipment by the manufacturers, were expected to maintain the installations later on. Such a system of training was neither systematic nor scientific and left the staff to their own resources to pick up whatever they could. They hoped that the Railways would shed their complacency regarding the practice of imparting indifferent training to electrical signal maintainers. They strongly urged the setting up of a well-equipped training center on each Railway for the training of electrical signal maintainers needed for the maintenance of modern signalling equipment. These centers, they recommended, should be adequately equipped with the working models of modern signalling installations and lessons should be given in basic techniques, installation and

maintenance. They suggested that curricula should be framed for both initial and refresher training.

114 The Railway Board stated that initially the training was imparted on the job during the course of installation of the equipment. With the increase in the number of installations, a centralized training programme had been developed in the Indian Railways Institute of Signal Engineering and Telecommunications (hereafter referred to as IRISET), Secunderabad. In acceptance of this recommendation the Railways were advised in June 1970 to develop, on priority, well-equipped training centers with suitable curricula for initial and refresher training of electrical signal maintainers in the maintenance of modern signalling equipment. The Railway Board have advised us that suitable facilities for training of electrical signal maintainers have been developed by all the Railways except North-Eastern, South Central and Western Railways which utilize the facilities created at IRISET, Secunderabad. A uniform syllabus for initial and refresher courses for signal maintainers was framed and circulated by the Railway Board in August 1975.

115 In they replies to the questionnaire the Railways have brought out certain deficiencies in the facilities for training of electrical signal maintainers. For instance, on the Eastern Railway the staff who have to take over the work are given on-the-job training by being associated with the installation work, on the Northeast Frontier Railway the training school at Pandu needs expansion so that training in new techniques can be organized properly, on the South Central Railway trainees are given practical training at stations for want of

modern signalling equipment in the Zonal Training School, on the Western Railway Staff are taken to stations or want of models of sophisticated signalling equipment like panel and route relay interlocking in the Signal Training Centre at Sabarmati, etc.

116 From the foregoing it will be seen that though the recommendation of the Wanchoo Committee for setting up centers of training electrical signal maintainers has been substantially implemented, there are deficiencies in the facilities for training in schools/centers on some Railways, especially in respect of models of sophisticated signalling equipment. We would urge the Railway 'Board to ensure that the Railway Administrations provide these facilities in schools for training of signal maintainers as early as possible.

117 Recruitment, training and grades of Signalling stag:— (Recommendation 50— Part 11)—The Wanchoo Committee considered that the question of recruitment training and grades of signalling staff called for an urgent decision and would be in the interest of safety in operation, which modern signalling equipment aimed at providing.

118 The Railway Board stated that necessary action was being taken. This question was discussed at the 10th Conference of Chief Signal and Tele-communication Engineers held in May 1969 and a Committee was asked to look into the regulations regarding recruitment, training, syllabus and grades, etc., for the inspectors and artisan staff of the Signal and Telecommunication Department. In November 1974,

Railway Board circulated the amended rules regarding recruitment of staff in the Signal and Telecommunication Department laying down, inter alia, the scales, quota for direct recruitment, qualifications and training to be given.

119 The Railway Board have advised us that amendments are being made in the rules as and when considered necessary. All the Railways have generally confirmed that the directive of the Railway Board is being followed except the North-Eastern Railway which has stated that it is awaiting directive from the Railway Board. Thus, this recommendation has been substantially implemented. The Railway Board should take steps to see that this directive is implemented on the North-Eastern Railway as well.

120 **Training of Panel Operators:—** (Recommendations 51 and 52— Part 11) The Wanchoo Committee suggested that the panel operators to be employed for operating route relay installation, centralized traffic control etc. should be trained in the centers set up for training of signal engineering staff. They felt that, before panel operators are employed on the operations of modern signalling equipment, competency certificates should be issued to them by authorized officers of operating and signalling departments jointly after proper test.

121 The Railway Board stated that necessary facilities for training of Such staff have been created in the IRISET, Secunderabad. They have also stated that competency certificates to panel operators are issued by Divisional Operating

Superintendents and Divisional Signal and Tele-communication Engineer jointly after proper test.

122 The replies of the Railways show that the panel operators on the Central, Northern, North-Eastern, Southern, and South-Eastern Railways are trained in the Zonal Training Schools or the Signalling and Telecommunication Training Centers. The Northeast Frontier Railway has stated that the panel operators for centralized traffic control and wayside panels are trained at site. The Western Railway has stated that facilities do not exist for the training of panel operators in the Signal Training School, Sabarmati and the staff are given training on the job. But a proposal for sending panel operators to IRISET, Secunderabad, for training is under %examination. The South-Central Railway has referred the matter to the Railway Board and is awaiting further instructions.

123 It is seen that training facilities for panel operators are still to be developed on some of the Railways. This recommendation has, therefore, been only partially implemented. We would urge the Railway Administrations to create the necessary facilities for training of panel operators without further delay.

124 Training of staff for maintenance of electric locomotives, traction and other electrical equipment:— (Recommendations 54(i) and (ii)—Part II)—The Wanchoo Committee had observed

that whereas the maintenance .of electric locomotives and other traction equipment is a highly specialized job requiring repairs, inspection, precision testing and measurement of a wide variety of machines and equipment, the staff lacked the necessary technical knowledge and each Railway followed its own system for imparting training to the staff. They considered it essential that the staff with requisite qualifications and experience was selected and trained for the job. They recommended that a centralized training school should be set up to train supervisory staff of all the Railways in the inspection and maintenance of electric rolling stock and traction equipment on the lines of the Signal and Telecommunication School at Secunderabad. Besides, each Railway having electric traction, should have a school for initial and refresher training of artisan staff and this school should also cater for the training of staff employed for the maintenance of General Electric and train lighting services.

125 The Railway Board have stated that a centralized training school for electric supervisory staff is being set up at Thakurli on the Central Railway. The schools for training of artisan staff already exist on the Railways and the facilities are augmented, wherever necessary.

126 We find that, though the planning for setting up of a centralized training school for electric supervisory staff commenced in 1971-72, not much progress has been made in the construction of the school building; only part of the hostel accommodation has been completed and laboratory equipment, models, etc. have still to be procured. Thus, the progress of setting up of the school has been extremely poor. The Railway Board have,

however, informed us that refresher courses are being held from December 1977. We feel that 'proper training of electric supervisory staff cannot be ensured in the absence of a centralized training school with necessary laboratory equipment, models etc. Thus, imparting of basic training to electric supervisory staff, envisaged by the Wanchoo Committee, remains. unfulfilled. The matter will not brook any further delay and the Railway Board should ensure the provision of a properly equipped centralized. training school with a sense of urgency.

127 From the comments of the Railways we find that facilities for-training artisan staff are available at Kurla Car Shed and Kalyan Loco Shed on the Central Railway, Kanpur on the Northern Railway, Gorakhpur on the North-Eastern Railway, Chakradharpur on the South-Eastern Railway and Vadodara on the Western Railway. The Eastern Railway has no school of its own but sends its staff' to Chakradharpur for training. The Southern Railway sends its staff to the electric workshop's at Perambur but does not consider the facilities to be adequate. The Railway, therefore, proposes to set up a school at Avadi. Thus, this recommendation of the Wanchoo Committee has been substantially implemented.

128 The Eastern and Southern Railways should take urgent steps to set up their own training centers for artisan staff for electric' traction.

129 **Training of diesel and electric locomotive drivers:-**

(Recommendation 56(i) to (iv)—Part II)— The Wanchoo Committee observed that the diesel 'or electric locomotive is

not a rugged machine like a steam locomotive and would be more apt to failure if handled incompetently. They considered that the driving staff for diesel and electric locomotives should have adequate educational and technical background. They emphasized that where such staff had to be selected from amongst steam locomotives drivers, they must be screened carefully and considerations of seniority etc._ should not come in the way of proper selection of men.

The Wanchoo Committee considered it necessary that the staff selected for working diesel and electric locomotives should be put through a systematic course of training under the guidance of fully trained and experienced personnel. They felt that the conversion training given to steam locomotive drivers would, unless it was on a systematic and properly directed basis, be hardly adequate to accomplish an efficient change-over. Though several Railways had introduced the pattern of training of diesel and electric locomotive drivers in simulation cabs, a greater degree of uniformity in conversion training was necessary and suggested that detailed curricula of training under Indian conditions should be drawn up. In their view, the techniques adopted for training drivers of diesel and electric locomotives should be on lines similar to those employed for training of aircraft pilots. Simulation training should be organized with great care if a crash, programme of converting steam locomotive drivers into diesel or electric locomotive drivers was to be gone through.

130 As regards educational qualifications the Railway Board have-stated that, in respect of the existing surplus staff 'on the steam side being absorbed on the diesel/electric side, a minimum

literacy standard is already laid down and adequate screening is being done without regard to seniority. They added that, in respect of fresh recruits, minimum educational qualifications had been laid down.

131 From the comments of the Railways we find that there is no uniformity in the minimum educational qualifications prescribed for selecting-staff from the steam side for conversion training in diesel or electric traction. The staff who are being given conversion training range from illiterates to matriculates. Thus, the recommendation that staff should have adequate educational and technical background remains unimplemented on most. Railways.

132 In their replies to the questionnaire of the Committee, the Railways have generally favoured stipulation of a higher standard of educational: qualifications for the staff selected for conversion training in diesel or-electric traction. The Central and Southern Railways have pointed out that direct recruitment of driving staff for diesel or electric traction is not' permitted; even if this was allowed the benefit of fresh recruitment will take' a long time to have any significant effect.

133 In December 1972, the Railway Board had directed the RDSO to develop aptitude tests for screening of steam drivers for diesel training and-also frame an intensive training programme for illiterate and semi-literate steam drivers and firemen in diesel traction. In their report submitted to the Railway Board in October 1973, the RDSO had given their views on the problem of training steam drivers in diesel traction. They

stated that` the root of the problem faced in imparting conversion training to steam-drivers and firemen in diesel traction is the recruitment policy initially framed for steam running staff. Generally, no educational qualifications or standard of literacy Was insisted upon for the staff to be employed as steam drivers. Such staff did not encounter much difficulty in shaping as steam drivers because the hardware to be handled by them was comparatively simple. When diesel traction was introduced, it was recognized that since the system was intricate, the running staff should have sufficient educational background to help them acquire the requisite skills with ease and it was laid down that only those steam drivers should be allowed to switch over to 'diesel traction who were matriculates or had comparable literacy standard. The RDSO notes that, as dieselization progressed, the quality of personnel available for drafting as drivers/assistant drivers started deteriorating due to depletion of the strength of educated staff on the steam side. It had also come to be realized that diesel driving was a more rewarding profession, and, in the face of representations, the policy of recruitment was reviewed by the Railway Board in 1967 when it was decided that the staff to be deployed on diesel traction need only be literates and they should not be debarred solely on the consideration of educational qualifications. Thus, educational qualifications were not insisted upon, and in the words of the RDSO, 'seniority' remained the exclusive criterion for deciding the eligibility of staff for conversion training in diesel mode of working. In this process, most of the drivers who became available for conversion training were also comparatively of advanced age.

134 The RDSO have stated that the recruitment policy should be so -oriented as to have optimum scope of inducting into the cadre, personnel who possess necessary skill and aptitude and minimum level of literacy for acquiring job proficiency of a reasonable standard. For drafting staff for the diesel side, they, inter alia, made the following suggestions: —

(i) The policy for selection should provide for both departmental drafting of surplus staff on the steam side and also direct recruitment from open market. Absorption of the staff rendered 'surplus on the steam side may be fulfilled to the extent it does not interfere with the objective of performance optimization and a flexible policy for direct recruitment may be adopted so that the cadre of diesel drivers gets progressively strengthened. A certain quota for direct recruitment could be fixed and, with the progressive shrinkage in the cadre of steam drivers and firemen, this quota could be gradually increased.

(ii) Psychological tests 'should be introduced in the selection of driving staff for diesel traction from the steam side to enable deployment of men with requisite abilities and aptitude for diesel working.

(iii) It would be desirable to lay down 47 years as the maximum age for conversion from steam to diesel traction; and

(iv) A minimum standard of education should be laid down for selection of diesel drivers. For direct recruitment as driver assistants, matriculation, or diploma in mechanical or electrical engineering may be prescribed as a minimum qualification. In

the case of the staff to be drafted from the steam side, preference may be given to such staff as are having matriculation or comparable standard of literacy and seniority should not be the criterion for selection. In case a relaxation in the standard of literacy became inescapable, a programme of adult education or preparatory courses should be introduced.

135 We note that the above suggestions of the RDSO were not accepted by the Railway Board. The age limit for conversion training had also been specified as 53 years as against 47 years suggested by the RDSO.

136 We agree that the staff utilized for operating diesel and electric locomotives should possess the necessary skill and aptitude and a minimum level of education for acquiring job proficiency of a reasonable standard. In this regard, we will examine in detail the whole question of recruitment, educational qualifications, and training of drivers for diesel and electric locomotives and give our final views in the subsequent report.

137 In. respect of conversion training the Railway Board have stated that intensive training is given to drivers of electric and diesel locomotives under actual conditions. The Central, Eastern, Northeast Frontier, Southern, South-Eastern and Western Railways have stated that systematic conversion training is given to steam locomotive drivers for working diesel and electric locomotives. The Northeast Frontier, Southern, South Central and Western Railways have further

indicated that the conversion training is adequate, and the performance of such drivers is monitered. The Eastern Railway has stated that the 'impact of conversion training is limited due to lack of educational qualifications. The performance of drivers is monitered and those found wanting are given special counselling and are also sent for refresher training as may be necessary. The Northern Railway has stated that a good training center has been set up at Kanpur for training electric locomotive drivers but it has not been possible to set up a regular training center for training diesel locomotive drivers due to paucity of funds. Thus, facilities for conversion training of driving staff from steam side to diesel/electric side have been by and large, developed on all Railways.

138 Regarding simulation training of drivers the Railway Board have stated that the same is not considered necessary. On the question of use of simulators for training, the Railways have stated that simulation training in its accepted concept has not been adopted. The Northeast Frontier Railway and Southern Railways have not considered it necessary to introduce simulation training. The Central, South Central and Western Railways consider its adoption useful and desirable. On the Eastern Railway, a car has been provided in the training school in which the working of a locomotive, particularly the trouble-shooting aspect, is simulated but it is not possible to simulate operating aspects. On the Southern Railway, a working model has been provided for the trainees to get familiar with the operation of controls not only in the static condition of the locomotive but also when running.

139 We note that the Railway Board collected some information in 1973 regarding the practice followed for training of locomotive driving staff in advanced countries. The information shows that the Japanese National Railways use simulators to a limited extent for training of drivers employed on the New Tokaido and Sanyo lines; the Canadian National Railways employ a sophisticated simulator for training of locomotive drivers; the Swiss and German Federal Railways do not use simulators and the British Railways have given up their use.

140 The Railway Board had not accepted the recommendation regarding simulation training of drivers. The Railways have also not adopted simulation training in its accepted concept, though some form of rudimentary simulation training is in vogue on some of the Railways. We will go into this matter further and advert to it in the subsequent report.

141 **Training of staff for mechanized inspection and maintenance of track:—** (Recommendations 59 and 60—Part II)—The Wanchoo Committee observed that the success of mechanized inspection and maintenance of track would depend on the availability of suitable personnel for maintaining and handling the equipment. They thought that it 'would be advantageous if an integrated programme which provides intensive training to the staff in mechanized inspection and maintenance of track in the works of the firms manufacturing the machines as also in the field was evolved.

142 The Railway Board have stated that arrangements for the training of staff in the works of the manufacturer of track-machines exist. Whenever such machines are purchased, 2 to 4 railway employees are deputed for training in the works of the manufacturing firm, so that they acquaint themselves fully with the machines during their manufacture. Some Railways also hold training courses for their staff in the handling of track-machines and help in training the staff of other Railways also. Training in mechanized inspection of track forms an important part of training given to inspectors and officers before they join regular posts.

143 The Railway Board had initially observed that an integrated programme for intensive training of staff would be evolved to cater for the future expansion of mechanized inspection and maintenance of track. In consequence, the Railway Board decided in April 1972 that a centralized training center for training staff in the mechanized inspection and maintenance of track may be set up on the Northern Railway. They also directed that operators and fitters who were entrusted with the maintenance and operation of 'on-track' tampers, etc. should be given training periodically in the maintenance workshops of the Railways. In pursuance of this decision, the Railway Board had approved the setting up of centralized training facilities in mechanized inspection and maintenance of track on the Northern Railway at an estimated cost of Rs. 11.35 lakhs and the first phase of the work was included in the Works Programme of 1974-75. In September 1975, however, the Northern Railway informed the Railway Board that the work of setting up of the centralized training school could not be taken in hand due to

the ban on the construction of non-functional buildings and sought their permission for the construction of the school, treating it as a functional building. Though the ban on the construction of non-functional buildings was withdrawn by 'the Government in January 1976, no progress was made in the setting up of the centralized training school and we find that this work was deleted from the Works Programme for 1977-78. The Railway Board then decided to develop these facilities for staff of all Railways, in one of the existing zonal training schools and views of the Central and South-Central Railways were sought in this regard. Both these Railways advised that additional facilities would be required for setting up such training facilities. in the existing zonal training schools. This issue was discussed at the meeting of the Additional Chief Engineers in June 1978, and it was decided that the Southern Railway should make a detailed proposal for the setting up Of the school at Arkonam. The Railway Board have now informed us that the Southern Railway is in the process of taking necessary action for the setting up of the school at Arkonam.

144 We are constrained to note that no progress has been made in the setting up of a centralized training center even after a lapse of 10 years and this recommendation of the Wanchoo Committee remain unimplemented. With the increase in the number of 'on-track' machines on the Railways from 18 in 1968 to 50 in 1978 and extension of mechanized maintenance on greater lengths of track on all Railways excepting the North-Eastern and Northeast-Frontier, the need for appropriate 'facilities for training of staff in mechanized maintenance and inspection of track cannot be over-emphasized. We would urge the Railway Board to take

expeditious steps for the setting up of a centralized training school for training of staff in mechanized inspection and maintenance of track at the earliest.

145 **Training of Drivers in handling steam locomotives—** (Recommendation 168—Part II)—The Wanchoo Committee observed that 29 and 26 per cent of the engine failures on the broad and meter gauges respectively during the years 1963-64 to 1967-68 were due to mismanagement by the engine crew. They considered it essential that the training of drivers in the handling of steam locomotives should continue to be pursued with vigour so that steam drivers remained Tully accomplished in their basic profession.

146 The Railway Board have stated that the training of loco drivers in handling steam locomotives has always been pursued with vigour. This aspect is regularly checked by the divisional officers. The curriculum in training schools included topics relating to good engineman ship.

147 We have reviewed the incidence of steam engine failures due to mismanagement by engine crew on the broad and meter gauges from 1968-69 to 1977-78. This information for the broad and meter gauges is given in Annexure V and VI. The comparative position is summarized in Table 24 below: —

TABLE 24
Steam engine failures due to mismanagement by engine crew on all Railways.

	Engine failures due to mismanagement by engine crew on all Railways		
	1963-64 to 1967-68 (As reviewed by the Wanchoo Committee)	**1968-69 to 1972-73**	**1973-74 to 1977-78**
Broad gauge	28.8	23.75	21.1
Meter Gauge	26.4	22.27	15.50

148 Will be seen that there has been a steady fall in the percentage of steam engine failures due to mismanagement by engine crew on the broad and meter gauges. From the performance of individual Railways, however, we find that, in the case of broad gauge on the Northeast Frontier, South-Eastern and Western Railways and meter gauge on the Central Railway, there was an increase in engine failures due to mismanagement by engine crew during 1977-78 as compared to the previous year. These Railway Administrations should take effective steps to reverse this trend.

149 **Training Schools- Capacities and facilities—** (Recommendation 106 (i), (ii)—Part 1)—The Wanchoo Committee observed that the available capacities for training had been utilized partially and that the percentage of utilization of capacity in the case of certain categories of staff had dropped on some of the Railways. They urged that the factors which militated

against the proper utilization of training 'facilities should be located and remedied.

150 The Railway Board, in their remarks, attributed the lower utilization of 'facilities for initial training in respect of certain categories of staff on some Railways to the tapering off in recruitment consequent upon the slower growth of transportation demand and to the fact that changes in the modes of traction necessitated the retraining of staff in the field rather than in the schools. The Railway Board had drawn the attention of the Railways in February 1969 and again in August 1972 that there were heavy arrears in refresher courses and that the training capacity -in the training schools/centers was not being fully utilized. The Railways were asked to locate the factors which militated against full utilization of the capacity in the training schools and take remedial action for liquidation of the backlog in refresher training. The Railway Board have advised us that utilization of the training capacity is being watched at their level and cells-have also been set up on the Railways to oversee training of staff. The main factor responsible for the under-utilization of training capacity' is the existence of vacancies. Enumerating the remedial measures taken, the Railway Board have stated that the recruitment of staff through Rail-- way Service Commissions to fill the vacancies in the field in the operating categories was taken up by the Railways. The orders imposing a ban on the creation of posts have been reviewed from time to time and the Railways can now create additional posts to meet their requirements of staff for operation and maintenance of additional plan assets and in consequence of introduction of new passenger and goods trains. The Railways have also

been allowed to create additional posts so as to operate leave. reserve at the prescribed minimum percentage in all categories of staff, except the loco running staff where it may be operated at the maximum limit of 30 per cent. The General Managers can also create trainee reserve posts kir running staff and other staff connected with safe working of trains as per prescribed norms so that the staff can be relieved for training.

151 In their replies the Railways have generally stated that factors which militate against proper utilization of training capacity have been identified, remedial 'action has been taken and the 'utilization of training capacity has improved substantially. The Central Railway has, however, stated that the attendance in courses at the Zonal Training School and other training centers has not been coming up to the programmed level. The attendance at the Zonal Training School during the years 1973-74 to 1977-78 ranged from 46 to 70 per cent. The most important reason for the shortfall is attributed to the unwillingness of the staff to go for training due to domestic problems arising out of their being away from their families and also due to some financial loss in case of running staff. It has been stated that the staff, therefore, avoid going to training schools by reporting sick at the last minute, which cannot be prevented unless an effective deterrent is evolved. The Central Railway has also mentioned that it is not possible to spare staff for training on certain occasions owing to deficient strength or a large number of staff being on leave at the time of major festivals. According to the Railway, the remedy lies in having adequate-strength and sufficient leave reserves/trainee reserve posts.

152 In reply to the questionnaire, the Railways have furnished information regarding the utilization of capacity of training schools/centers, during 1977-78 for initial/ refresher/ promotional courses. We find therefrom that, in the case of a number of safety categories of staff, the utilization of capacity on most of the Railways has been less than 50 per cent. The percentage of utilization of available capacity for permanent way inspectors and other categories of Civil engineering staff in the case of most Railways has been particularly poor, ranging from a mere 22 per cent on the Eastern Railway to 50 per cent on the South-Central Railway. Similarly, in the case of signal inspectors and signal maintainers, the utilization of capacity has been unsatisfactory. From the information made available by majority of the Railways, we find that there has also been a deterioration in the utilization of capacity for refresher courses to certain safety categories or staff during 1977-78 as compared to 1968-69. This can be seen from Table 25 below:

TABLE 25

Utilisation of Training Capacity for giving Refresher Course

S. No.	Category	Number of staff actually attended taken as a percentage of staff booked to attend		Railway
		1968-69	1977-78	
1	Station Masters & Asstt. Station Masters	92.0	45.0	Eastern
		70.5	45.0	Western
2	Switchmen	100.3	65.0	Eastern
		60.0	45.0	Western
3	Cabinmen	60.0	40.0	Southern
		60.0	40.0	Western
4	Levermen & pointsmen	82.0	69.0	Central
		120.0	40.0	Eastern
5	Shunters	98.8	69.5	Northeast Frontier

6	Train Examiners	40.0	30.0	Southern
7	Guards	73.0	67.0	Central
8	Shunting Jamadars	99.0	42.0	Western
9	Block & Signal Maintainers	95.0	60.0	Central
10	Permanent Way Inspectors	35.0	20.0	Central
		44.0	22.0	Eastern
		50.0	40.0	Southern
		55.0	50.0	South Central
11	Permanent Way Ministers	91.0	34.0	Eastern
		70.0	30.0	Western

Note: The requisite information regarding the utilization of capacity for initial and promotion courses has not been furnished by all the Railways.

153 The information furnished by the Railway Board for 1977-78 also shows that the utilization of capacity in quite a number of schools has been as low as 18 per cent. The utilization of capacity in the Zonal Training School, Dhanbad, on Eastern Railway was 43 per cent and, in the case of System Technical School, Bongaigaon, on the Northeast Frontier Railway it was 67 per cent.

154 From Ate foregoing 1t will be seen that the available training capacity is 'grossly underutilization. The recommendation, therefore, remains unimplemented. We feel that the factors which militate against the full utilization of the training capacity have been known for a very long time, but remedial action is still wanting. Viewed against the background of heavy arrears of refresher training to be overtaken, the present position is totally indefensible. The Railway Board should take effective steps in this direction and ensure full utilization of the training capacity.

155 **Backlog in refresher training:-**

(Recommendation 114— Part I) -The Wanchoo Committee felt that much remains to be done if the backlog in Refresher training is to be cleared and the recommendation of the Kunzru committee effectively implemented.

156 The Railway Board had initially stated that the need for early clearance of backlog in refresher training would be impressed on the Railways and the factors which militated against its clearance were being looked into. The Railway Board have now advised us that the need to clear the 'backlog was impressed on the Railways in November 1973, and with a view to facilitate this, they had permitted the Railways to create trainee reserve posts to the extent required. They have stated that the progress of clearing "backlog is watched through periodical returns sent by 'the Railways. The Railways have generally stated in their comments that, effective steps have been taken to clear the backlog and considerable improvement has been achieved.

157 From the information furnished by some of the Railways, however, we find that shortfall in the refresher training of staff in the categories of station masters, assistant station masters, switchmen, cabinmen, lever men, permanent way inspectors and gangmates still ,persists, The percentage of staff who did not attend the refresher courses to those who were booked for the same ranges from 18 to 64 per cent. In the category of signal maintainers, the Shortfall exceeds 80 per cent on the South-Central Railway. The position was also

not satisfactory in the case of refresher training to 'firemen, diesel assistants and motormen.

158 The Railways have attributed the backlog in refresher training to inadequacy of trainee reserve posts, failure to nominate staff for training, failure to make relief arrangements in time, nominated staff reporting sick etc.

We cannot understand why the Railways are still feeling the shortage off trainee reserve posts when the Railway Board have categorically informed us that this need has already been adequately provided for. All these factors are well within the control of the Railways and should not have been put forward as an alibi.

Other staff matters:

159 The Wanchoo Committee made 33 recommendations and observations on the subject of 'Other Staff Matters'. Out of these, items 71, 72, 77, 77(a) and 79 of Part II have been either implemented' or appropriate action has been taken by the Railway Board. Our detailed review of the remaining recommendations is contained' in the following paragraphs.

160 **Housing of Essential Staff:—** (Recommendations 73(i) to (v)-- Part III—The Wanchoo Committee noted that there was no uniformity in the criteria adopted for classifying the staff as essential. They held the view that essential staff, who should receive preference in the allotment of houses should be such personnel as are liable to be called for duty at any time at short notice or at odd

hours and but for whom train running. would be immediately hampered. They suggested that-

(i) the Railway Board should bring about uniformity in the" classification of staff as essential and non-essential.

(ii) since even among the essential categories, the priority may be different and since it may not be politic to deprive nonessential categories of housing altogether, a priority schedule may be prescribed in more or less the same manner as priority schedule for allotment of wagons.

(iii) first priority in housing should go to running staff and second" priority to train passing staff like station masters, switchmen, cabinmen, shunting jamadars, etc. Signal maintainers who are likely to be called at night may also be included in the latter group. The policy in regard to building of new quarters and! their allotment should be based on the priority schedule; and

(iv) of the existing accommodation, as a rule; all quarters allocated' for essential staff should, on- vacation, be allotted to essential staff, keeping in view the priority schedule. Of the other quarters falling vacant, 50 per cent should be allotted to the essential staff so that a progressively higher percentage of essential staff is housed in accordance with the priority schedule laid down.

161 The Railway Board have stated that, with a view to ensuring that as many of the running staff as possible are housed, instructions had been issued that existing quarters vacated by essential running staff should ordinarily be allotted to such staff and that 50 per cent of the total allotment for building staff quarters should be utilized for the construction of quarters for essential running staff during the Fourth Plan period. According to them this would take care of the vast majority of essential staff. They further added that it was not administratively feasible to have a rigid definition of essential staff.

162 We thus find that no clear definition of who should be treated as essential staff has so far been laid down s by the Railway Board and uniformity in the criteria for so classifying the staff is still missing. However, in view of the difficulties indicated by the Railway Board, we will go into the matter further and advert to it in the subsequent report.

163 **Provislion of staff quarters.—** (Recommendation 131—Part 1, 74 -Part II)--The Wanchoo Committee observed that, in spite of the fact that the strength of staff had increased practically in all categories, the percentage of those provided with railway quarters bad kept pace and, in the case of some categories, the position had shown definite improvement, a lot more remained to be done. They considered that, in the case of railway staff concerned with train operation, the provision of railway quarters was a matter of necessity rather than an-amenity and would prove conducive to increasing the element of safety in train operation.

The Wanchoo Committee found considerable strength in the suggestion made by the Railway Board that, to the extent money is spent on housing of staff, the Railway Administrations should get relief from payment of interest on capital. They urged the Government to give this matter their closest consideration.

164 In their remarks, the Railway Board stated that provision of staff quarters to all staff concerned with train operation involved very heavy financial outlay and would necessarily have to be done on a programmed basis, taking into account the

availability of funds. They added that this recommendation is being implemented by constructing staff quarters every year. The percentage of railway staff provided with quarters on each railway has been advised as under: —

TABLE 26

Railways	Percentage of staff housed (as on 31-3-1977)
Central	29.5
Eastern	37.2
Northern	43.7
North-Eastern	41.0
Northeast Frontier	61.0
Southern	30.2
South Central	36.6
South-Eastern	44.8
Western	40.0
Chittaranjan Locomotives Works	55.0
Disel Locomotives Works	40.4
Integral Coach Factory	12.8
Research, Design & Standards Organization	58.7

165 The Railway Board have furnished information regarding the progress of construction of staff quarters, amount spent on their construction and the percentage of staff housed since the First Five-Year Plan. This is summarized in Table 27 below: —

TABLE 27

Progress of construction of staff quarters

Period	Number of staff quarters built		Amount spent under Plan Head 'Staff Quarters'		Percentage of staff house at the end of period
	During period	Average per year	During period	Average per year	
			(Rs. In crores)		
(1)	(2)	(3)	(4)	(5)	(6)
First Plan (1951-52 to 1955-56)	38,703	7,741	Not available		
Second Plan (1956-57 to 1960-61)	57,803	11,561	38	7.60	34.84
Third Plan (1961 -62 to 1965-66)	71,570	14,314	44	8.80	35.86
Fourth Plans (1969-70 to 1973-74)	22.529	7,510	18	6.0	35.98
Fifth Plan	27,674	5,353	31	6.2	37.18
	21.013(approx..)		32.79(approx.)		37.68
(1)	(2)	(3)	(4)	(5)	
Annnual					
1974-75	4,804		4.19	37.68	
1975-76	3,720		4.17	37.62	
1976-77	3,492		6.56	37.43	
1977-78	3,627		8.00	37.14	
1978-79	5,370		9.87		
	(Proposed)		(Revised)		

166 It will be seen that the annual rate of construction of staff quarters has been falling continuously since 1965-66. As a result of this, the percentage of staff housed which had increased to 37.81 in 1968-69 as compared to 34.84 in 1955-56, has marginally declined in recent years and stood at 37.14 in 1977-78.

167 We note that the Railway Board had referred to the Ministry of Finance the question of relief from payment of interest on the money spent on housing of staff. This was, however, not agreed to by the Ministry of Finance on the consideration that this arrangement was likely to result in an extra benefit to the railway staff as compared to other Government employees. The Railway Board have advised us that, consequent to the recommendation made by the Railway Convention Committee 1973, the Parliament had approved that the cost of construction of staff quarters should be charged to Capital during the period 1974-79 and dividend would be payable on such Capital only if the Railways have surplus after discharge of all other liabilities. We understand that the Railway Board are requesting the Railway Convention Committee for continuation of the said arrangement beyond 1979. The Railway Board have stated that since the cost of non-gazetted staff quarters is now charged to Capital and the dividend on such 'capital is payable only if the Railways have surplus after discharge of all liabilities, the above recommendation of the Wanchoo Committee would deem to have been fulfilled for all practical purposes.

168 We feel that Parliament having approved charging of the cost of construction of staff quarters to Capital and also that dividend

would be payable on such Capital only if the Railways have surplus after discharging all other liabilities, there should have been an increase in the number of staff quarters constructed. We hope that necessary steps in this direction will now be taken by the Railway Board.

169 We have also called for information from Railways regarding the percentage of 'staff in essential categories, mainly concerned with train operations, who have been provided with quarters. We shall comment on this further in our subsequent report.

170 **Job Analysis of Signal Maintainers.**— (Recommendation 75(i) & (ii)—Part II).—The Wanchoo Committee suggested that the work of signal maintainers should be properly job-analyzed and if the nature and quantum of work was such that they have to work on rosters of 8 hours or 12 hours, steps should be taken accordingly. They felt that in the days to come, demand on the time of signal maintainers would increase and recommended that wherever the position is such that a signal maintainer who may have been working during the day is often required to attend to f allures during night also, a more permanent solution of the problem would have to be found.

171 The Railway Board accepted these recommendations and in September, 1969 issued a directive to the Railways to job analyze the work of all signal/block maintainers, who were then classified as ***`Essentially, Intermittent'** and to take action to reclassify them. as **\*`Continuous'** in accordance with the provisions of Hours of Employment Regulations

wherever the work had increased to justify such reclassification. The Railways were also advised that in the case of signal/block maintainers who are rostered to work at out-stations, occasions when they have to be sent out for attention to failures would be reckoned as overtime-working with statutory rates of overtime being payable. Special cases of sections where there are chronic failures were to be taken care of by providing additional staff temporarily or on long term basis as the case may be until the situation was brought under control. The Railway Board have advised us that the above instructions have been implemented on all the Railways.

*Note: Classification of Railway Servants in accordance with the Hours of Employment Regulations

172 In their replies while most Railways have confirmed implementation of the directive of the Railway Board, the Eastern Railway has stated that some more staff at busy stations, sections and installations and also additional staff for attending to failures at other locations would be necessary, which it has not been possible to provide due to the ban imposed by the Railway Board. The Northeast Frontier Railway has stated that the yardstick is still to be issued by the Railway Board. The South-Central Railway has advised that there are no instructions from the Railway Board so far and that the electrical signal maintainers are being continued round the clock except at the nominated busy installations where the 8/12 hours roster is followed, depending on the workload.

173 Resardiqg arrangements for attending to failure during night, the Railways have generally confirmed that wherever there are chronic failures, separate maintenance ,staff is provided. The

North-Eastern Railway has stated that their proposal for creation of posts of signal maintainers for night failure sang has still not been agreed to by the Railway Board.

174 From the foregoing we find that the Wanchoo Committee's recommendation regarding proper job analysis of the work of signal maintainers and their rostering in 8/12 hour shifts, as may be necessary, has not .been implemented on all the Railways. A permanent solution of the problem of attending to failures during the night has also not been possible on some Railways. We would urge the Railway Administrations to look into this for early implementation. In view of the points raised by some Railways, we will also examine this mattes further and comment on it in the subsequent report.

175 **Duty Hours of Running Staff: —** (Recommendation 118, 119-Part 1, 76, Part II)—The Wanchoo Committee observed that on some of the Railways, trips of more than 12 hours running duty ranged between 15 and 20 per cent of the total, number of trips performed by goods train drivers during 1967-68. Every Railway had instances of trips exceedingly even 20 hours of duty. They urged that vigorous steps should be taken to ensure that 12 hours running duty is ordinarily the limit and that cases of running duty exceeding 12 hours are brought down further and are an exception rather than the rule. Wherever on any section chronic long hours seemed inherent, steps should be taken Ito change the crew at a suitable place so as not to infringe the prescribed duty hour limitations.

176 The Railway Board have stated the Railway Labour Tribunal 1969, which reviewed the hours of employment, overtime, and periodic -rests of railway employees, including running staff, recommended in their report that running duty at a stretch of running staff should not ordinarily exceed 10 hours but such duty may extend to a maximum of 12 hours provided the appropriate authority gives at least 2 hours' notice before the expiry of 10 hours to the concerned staff that they will be required to performed running duty for 2 hours more, provided further that the total maximum hours of duty from signing-on to signing off did not exceed 14 hours. They also recommended that the total maximum hours should progressively be reduced by half an hour every 2 years from the date of the said report till the period of 12 hours was reached i.e., at the end of $ years from the date of the report the total maximum period of duty at a stretch from signing-on to signing-off shall not exceed 12 hours. The Railway Board have stated that, in liberalization of the above recommendation of the Tribunal, the Minister of Railways in August 1973 agreed to reduce the overall duty hours of "running staff from signing-on to signing-off to 10 hours. The reduction in the hours of work of running staff was sought to be achieved. in phases over a period of three years. It has been stated that accordingly, all passenger-carrying trains and about 80 per cent of the goods. trains have already been brought under the 10-hour rule. In case of exceptional circumstances like accidents, floods, and emergencies where duty beyond 10 hours becomes inevitable, the notice of extension of duty hours will have to be given at the end of 8 hours. However, as there was a ban on the creation of additional posts during the period of emergency, cent per cent

running staff could not be covered under the 10-hour rule. The Railway Board have stated that sanction has been issued to the Railways in December 1977 for the creation of about 2700 additional posts in various categories to fully implement the 10-hour rule for running staff. Action is being taken by the Railways to recruit, train, and place additional' staff in working posts. As soon as this is done, more and more running staff would be covered by the 10-hour rule and there will be fewer occasions for running staff to work in excess of the prescribed limits. The Railway Board have added that running staff may have to work in excess of the prescribed limits on occasions like floods, fire, accidents and other contingencies of unforeseen nature when it may not be possible to relieve. running staff in time. For work put in by running staff in excess of 104 hours in a two-weekly period, they are paid overtime.

177 In their replies on the action taken, the Railways have generally stated that the position in respect of long hours of duty by running staff has improved considerably over the years due to various measures which have been taken. These include setting up of special cells for watching the hours of duty put in by running staff, construction of new running 'rooms, provision of double set crews, changing crews at intermediate places, creation of additional posts, etc.

178 In reply to the questionnaire of the Committee the Railways have furnished information regarding the incidence of running duty by drivers in excess of 10 hours at a stretch during 1977-78. This has been given in Annexure VII. We are happy to note that in respect of hours of running duty of

driver's grades A and B, working mail, express and passenger trains, there has been a marked improvement and there were only stray cases of running duty exceeding 10 hours on a few Railways. In the case of driver's grade 'C', the incidence of running duty of more than 10 hours, 12 hours and 20 hours during 1977-78 together with the position obtaining in 1967-68 is summarized in Table 28.

TABLE 28

Incidence of over- hours of running duty of driver's grade 'C'

Railway	Trips of over-hours of running duty taken as a percentage of total numbers of trips				
	More than 10 hours	More than 12 hours		More than 20 hours	
	1977-78	1967-68	1977-78	1967-68	1977-78
Central	32.4	15.9	17.3	1.1	1.0
Eastern	21.4	15.1	9.4	0.7	0.004
Northern	N. A.*	5.6	N.A.*	0.3	N.A.*
North-Eastern	34.0	9.4	17.3	0.3	1.1
Northeast Frontier	15.8	20.3	5.6	0.5	Nil
Southern	14.0	18.5	5.7	0.9	0.004
South Central	25.2	34.3	12.6	2.0	0.9
South-Eastern	N.A*.	7.0	N.A.*	0.1	N.A.*
Western	16.6	17.5	7.5	0.2	0.02

* N.A. – Not Available

179 The incidence of running duty of more than 10 hours at a stretch in the case of drivels grade 'C' working goods trains is high and }ranges between 14 per cent on the Southern Railway to 34 per cent on the North-Eastern Railway. In comparison to the position obtaining in 1967-68, the incidence of trips with running duty exceeding 12 hours at a stretch has gone up on the Central and North-Eastern Railways. From Annexure VII it will be seen that the incidence of trips with more than 14

hours running duty when taken as a percentage of the total number of trips by goods train drivers were 8.8, 8.1, 7.8, 1.5, 5.8 and 1.9 on the Central, Eastern, North-Eastern, Southern, South Central and Western Railways respectively. Trips of more than 20 hours running duty at a stretch accounted for 1.0, 1.1 and 0.9 per cent of the total number of trips on the Central, North-Eastern and South-Central Railways. From the foregoing we find that the recommendation made by the Wanchoo committee and accepted by the Railway Board, still remains to be implemented in the case of driver's grade 'C' working goods trains on all the Railways. It is unfortunate that, in a matter which has such a direct bearing on safety, the action taken so far has been tardy.

180 Running Rooms:-

(Recommendation 78(i) and (ii)-Part II)- The Wanchoo Committee recommended that the yardsticks prescribed for the provision of amenities in the running rooms should be rigidly applied in order to ensure adequate facilities for the comfort of running staff. They observed that it was important from the point of view of safety of train operation that running staff in the categories of drivers, firemen and guards should not under any circumstances be deprived of adequate rest at the end of their journey. The practice of travelling ticket examiners occupying beds in the running rooms either singly or in squads should be stopped. They urged that wherever a complaint of this nature existed separate arrangements should be made for accommodation of travelling ticket examiners, conductors, etc. They particularly drew attention to the complaints voiced by running staff in this respect and also regarding the lack of

basic amenities like mosquito nets, bed sheets, linen, utensils, crockery, etc. in several of the running rooms.

181 The Railway Board had asked the Railways to take effective steps for the provision of prescribed amenities in running rooms and to regulate their utilization in a manner as would enable running staff to take adequate rest. They also directed, that separate rest rooms should be provided for non-running staff, where necessary. However, the Railways were allowed to utilize running rooms for stay of non-running staff, where spare capacity was available provided it did not cause any inconvenience to the running staff,

182 The From the replies given by the Railways to the questionnaire of the Committee, we find that as per the Railway Board's directive, conductors, AC coach attendants, dining car catering staff, AC coach passenger attendants, end-on-generator attendants and travelling ticket examiners have been allowed to take rest in running rooms subject to the availability of accommodation over and above that required for running staff, and the complaints by the running staff in regard to the inconvenience caused by the use of running rooms by non-running staff are rare. According to the Railways, every effort is also being made to ensure that amenities are provided in the old and new running rooms as recommended by the Running Room Improvement Committee-1956. The condition of running rooms and the amenities and facilities provided in them are regularly inspected by officers and supervisors with a view to taking remedial action, where necessary.

183 We note that one Additional Commissioner of Railway Safety has referred to the poor maintenance of running rooms, narrow kitchens, absence of proper dining rooms, poor ventilation and congestion in living rooms, existence of dry latrines, running rooms presenting a, dingy appearance. lack of outlets for smoke, dirty dining tables, dirty linen, etc. In the light of these observations, though limited in nature, we feel constrained to say that much remains to be done in the matter of upkeep of running rooms.

184 The In view of the introduction of new trains and changes in the pattern of train services and general improvement in the standard of living of the people, we feel that the assessment of 'accommodation, amenities and facilities to be provided in and maintenance of running rooms has to be a continuing process so that running staff directly connected with safety of train operation should have adequate rest in modestly furnished but clean and sanitary rooms.

185 **Shortage of staff:-**

(Recommendation 115- Part I)- The Wanchoo Committee observed that the overall extent of shortages in the various categories of staff on 31-3-1968 ranged between 1.4 and 3.0 per cent except in the category of assistant drivers where the shortage was to the extent of 5.9 per cent. Over individual Railways, in some categories the shortages were glaring but, by and large, the extent of shortage had been diminishing. They urged that this matter should continue to receive the urgent attention of the Railway Administrations.

186 The Railway Board had stated that the shortages on some Railways had been mostly in promotional categories of staff where the work had not been affected since officiating arrangements had been made against the vacancies, wherever necessary. The Railway Board have further stated that instructions to minimize delays in the holding of selections were issued in October 1976 and the position has improved to a great extent.

187 From the information furnished to us by the Railways we have examined the shortages in different categories of staff namely, station masters, assistant station masters, switchmen, cabinmen, levermen and points men, shunting jamadars! Gunners shunting master's and shuntmen, guards, drivers, firemen, assistant drivers, permanent way and assistant permanent way inspectors and train examiners as on 31-3-1978. This, along with the position as existing on 31-3-1968, is shown in. Annexure VIII.

188 The It will be seen that in the categories of station masters, assistant station masters, switchmen and cabinmen, the shortage had increased on all the Railways in 1977-78 compared to the position in 1967-68. In the case of the remaining categories of staff, except levermen and pointsmen On the Southern, North-Eastern and Central Railways, shunting jamadars/ gunners/shunting masters/shuntmen on the Southern and North-Eastern Railways, guards and train examiners on the North-Eastern Railway, drivers on the Eastern, North-Eastern and South-Eastern Railways, firemen on the Eastern, North-Eastern and South Central Railways, assistant drivers on the Eastern Railway and permanent way inspectors on the

Southern Railway, the shortages had increased on all other Railways showing deterioration in the position as compared to 1967-68.

189 In view of the foregoing, we are unable to accept the claim made by the Railway Board that the position in respect of shortages has improved to a great extent. Thus, the recommendation of the Wanchoo Committee. remains unimplemented for most categories of staff on the Railways. The need to wipe out the shortages cannot be over-emphasized, and we would urge the Railway Board to take effective measures in this regard.

190 Overtime working.— (Recommendation 116—Part I)—The Wanchoo Committee felt that the measures necessary to curb overtime working by staff had not received the attention they deserved inspite of the great stress laid on the subject of working conditions of staff by the Kunzru Committee.

191 The Railway Board have stated that some of the factors which-have contributed to increase in expenditure on overtime payment on the Railways are revision in the Hours of Employment Regulations as a result of acceptance of the recommendations of the Railway Labour Tribunal, 1969, which have resulted in the reduction in the hours of work, payment of overtime at 1 times of the ordinary pay beyond rostered hours and up to the statutory limit, increase in the rate of statutory overtime from 1 to twice the ordinary pay beyond the statutory limit, introduction of daily system of overtime payment for certain categories of staff including office staff, gangmen etc., as against averaging the hours over a. two-weekly period, all

time spent by running staff for travelling spare on duty being considered as duty with a few exceptions. and payment of arrears of overtime in accordance with the recommendations made by the Tribunal with retrospective effect from 1-8-1974. The have added that in December 1977, about 10,000 additional posts have been sanctioned to implement the various recommendations of the Railway Labour Tribunal, 1969, and in January 1978, 2700, posts were sanctioned to implement the 10-hour rule for the running staff. Actual posting of the additional hands will take some more time. With the posting of additional staff, it is expected that the expenditure on overtime payment will come down considerably. The Railway Board have further stated that to guard against excessive overtime payment to staff, leave reserves have been provided in the cadre of various categories of staff to substitute in the place of regular workers during their absence on leave, sickness, training, medical examination, enquiry attendance etc. Depending upon the incidence of absenteeism in different categories due to various causes, a percentage of working strength of personnel was provided as leave reserve in accordance with the instructions issued in 1951 and 1958. The General Managers were authorized to sanction the requisite number of staff within the range of prescribed percentages after analysis of absenteeism. The adequacy of leave reserve has been examined from time to time and wherever there was justification for enhancing the percentage, the matter has been examined with due consideration.

The Railway Board have furnished information showing the trend in overtime payment made on the Railways, Production Units, etc. during the years 1972-73 to 1976-77 which is shown in Table 29. They have stated that the variations are

very insignificant and the incidence of overtime payment is well below 2 per cent of the wage bill.

TABLE 29

Payments for overtime on the Railways and Production units

Year	Total wage bill (in Rupees thousands)	Total overtime (in Rupees thousands)	Percentage (3)/(2)x100
1	2	3	4
1972-73	4,73,23,13	7,76,74	1.64
1973-74	5,23,34,88	8,17,47	1.56
1974-75	6,75,91,15	10,16,62	1.50
1975-76	8,05,36,28	11,75,71	1.46
1976-77	8,36,46,32	10,40,72	1.24

192 The Wanchoo Committee had made their observations after examining the overtime working and the average spell of overtime by certain safety categories of staff, namely, station masters and assistant station masters, switchmen, cabinmen, levermen and pointsmen. They had -found the incidence of staff working overtime fairly high and the average spell of overtime considerable on some Railways. The comments of the Railway Board are based on the ratio of the amount paid as overtime to the total wage bill of all the staff and does not, therefore, throw light on the incidence of overtime incurred on staff in categories connected with safety of train operation. We had asked the Railways to indicate the incidence of overtime working and the average spell of overtime for the years 1976-77 and 1977-78 for certain categories of staff, including those surveyed by the Wanchoo Committee. Most Railways have not been able to furnish the requisite information. The Central Railway has furnished in-. formation in respect of some operating categories which is given in Table 30 below.

TABLE 30
Incidence of overtime working on the Central Railway

Category	Number of cases during		Total hours of overtime working	
	1976-77	1977-78	1976-77	1977-78
Station Masters/Asstt. Station Masters/Cabin Asstt. Station Masters	13783	14302	246759	312231
Switchmen	2541	3082	47306	75529
Cabinmen/Levermen and pointsmen	16204	25010	170463	280115

193 It will be seen that there was a marked increase during 1977-78 in the number of cases of staff working overtime and also the hours of overtime working as compared to 1976-77. The Western Railway has also stated that overtime working due to chronic shortage of staff. The average Spell of overtime done by an assistant station master in a period of 14 days is 30 hours. The average spell of overtime in other categories is shown in Table 31 below.

TABLE 31

Category of staff	Average spell of overtime in hours in each 14-day period
Switchmen	**8**
Cabinmen	**4**
Levermen	**4**
Pointsmen	**4**
Signal Main trainers	**8**
Inspectors in shift duties	**8**

194 From the foregoing we find that the incidence of overtime working persists to a significant extent even in the case of safety categories of staff. The railway Board should take effective steps to bring

down overtime working to the minimum in the case of categories of staff connected with safety of train operations.

195 Leave Reserves.— (Recommendation 117—Part I)—The Wanchoo Committee strongly recommended that the question of overtime working and leave reserves on each railway should be reviewed so that the incidence of excessive hours of work was reduced to the minimum and the requirements of leave, training, transfers, promotions, periodical medical tests, sports and other welfare activities etc. are met with to a liberal extent, They did not appreciate the Railway Board's directive clamping down the leave reserves at the level obtaining on 4-2-1967.

196 In their remarks, the Railway Board stated that, in accordance with the Government's decision to effect all-round economy, orders were issued in February 1967 not to increase leave reserve percentages beyond the level obtaining on that date. Pursuant to the above recommendation of the Wanchoo Committee and in the wake of repeated representations from the staff side, the position was reviewed by the Railway Board and in November 1968 instructions were given that in respect of staff connect-- ed with safety of train operations, the minimum percentages prescribed should be worked to where the actual percentage of leave reserve posts was less than the minimum. In December 1969, it was decided that in respect of all categories of staff the minimum percentage of leave reserve posts should be operated in those cases where the same was below such minimum. The Railways were informed accordingly. However, having regard to the financial position, the Railway Board had asked the Railways not to proceed

further with the implementation of the order issued by the Railway Board in December 1969. The Railways were subsequently permitted to implement the instructions to bring up the leave reserve percentages to the minimum prescribed. The Railway Board have advised us. that ban on creation of posts etc. has been in existence all along from 1960. On account of this ban, it was not possible for the Railways to provide leave reserves even up to the minimum percentages prescribed. In February 1978, instructions were issued to the Railways permitting them to bring the leave reserve percentage (except in posts pertaining to Demand No. 4—General Administration) up to the minimum prescribed whenever it was below that minimum. In respect of loco running staff, instructions were given in June 1978 that the reserve percentage should be brought up to the maximum limit, i.e. 30 per cent. In their comments, the Railways have generally stated that action is being taken to provide leave reserve as per the above directive of the Railway Board.

197 In the questionnaire of the Committee, the Railways were asked regarding the adequacy of leave reserve posts in respect of categories of staff connected with the safety of train operations. The Railways have stated that leave reserve provision in the categories of switchmen, cabinmen grade I, shunting jamadars, levermen, pointsmen, signal maintainers, train examiners, permanent way inspectors and mistries, gangmen and gang-mates is generally inadequate and have suggested enhancement of the existing percentages.

198 We may mention that the percentages of leave reserve posts to be adopted for various categories of staff in class III and class IV

were laid down by **the Railway Board in August 1951 on the basis of the recommendations made by Shri Justice G. S. Rajadhyaksha of the Bombay High Court,** who had been appointed as the Adjudicator in an industrial dispute between Indian Government Railway Administrations and their respective workmen. These percentages were again examined in 1958 and, since class IV staff had by then been brought on par with other categories of staff in the matter of leave entitlements, it was decided that leave reserve for class IV should be provided at the percentages applicable for class III staff. These percentages have remained unchanged ever since and are shown in Annexure IX.

199 The present level of leave reserves which the Railways have been permitted to operate in various categories has been found inadequate and this recommendation of the Wanchoo Committee remains unimplemented. We shall examine this matter further and advert to it in the -subsequent report.

200 **Recruitment through Railway Service Commissions:—** (Recommendations 120, 121—Part I)— The Wanchoo Committee found that the average time taken by the various Railway Service Commissions for recruitment of certain categories of staff often exceeded the time schedules prescribed by the Railway Board. They observed that many of the panels of the selected candidates were either partially used or not used at all by the Railway Administrations on the plea that the vacancies anticipated at the time of placing the indents had not materialized. They suggested that (i) the Railway Administrations should assess their requirements on a rational basis; (ii) the Railway Service Commission should

observe the prescribed time schedules and offers of appointment to the selected candidates should be made within a reasonable time.

201 The Railway Board have stated that, due to the curtailment of railway activities, the expected expansion did not take place in the 2 years prior to the appointment of the Wanchoo Committee and, therefore, the in-'dents placed on the Railway ,Service Commissions in 1965-66 on the basis of these forecasts could not be fully utilized.

202 In their replies to the questionnaire of the Committee the Railways have stated that there are no cases of panels having lapsed or not utilized for want of vacancies but delays did occur in the case of recruitments made through the Railway Service Commissions.

203 From the information forwarded by the Railway Service Commissions, we have examined the time taken for the selection of candidates for technical and other categories during the years 1974-65 to 1977-78. This is shown in Annexure X. We find that the time taken for finalizing the panels varied, from 3 to 28 months in the case of technical categories staff, against the prescribed time schedule of 5 months and in the case of other categories of staff it varied from 4 to 42 months against the. prescribed time_schedule of 7 to 12 months. Thus, in most cases, the time schedule was substantially exceeded in finalizing panels. According to the Railway Service Commissions excess time taken was due to the very large number of applications received in response to employment notices, time-consuming scrutiny of the applications, making

arrangements for examinations/interviews at a good number of centers, evaluation of the answer book etc. The workload was particularly heavy in the case of selections for popular categories of staff. The Railway Service Commission, Bombay, has suggested that the delays can be cut down to a certain extent by increasing the strength of staff of the Railway Service Commissions in general. They *have* indicated that computerization of selection process for popular categories can reduce the period by more than a year. The Recruiting Committee, Northeast Frontier Railway, has suggested that in view of the difficulties involved in holding a mass examination every year for a small number of vacancies in popular categories for which the minimum qualification is only matriculation or its equivalent, a consolidated indent of actual requirements for 2 years with anticipated requirements for the next 2 years would avoid the holding of these selections every year.

204 The Railway Board have advised us that after discussions with the 'Chairmen of the Railway Service Commissions in February 1978, the procedure for recruitment has been amended. According to the new procedure the time schedule for issue of employment notices and holding of examinations every year by the Railway Service Commissions for recruitment to popular categories has been laid down without having to wait for Indents from the Railways. This is given in Table 32.

TABLE 32
Time Scheule or Railway Service Commissions

Railway service Commission	Employment Notice advertisement to issue by	Examination to be held in
Allahabad	**December**	**May**
Bombay	February	September
Madras	September	February
Secunderabad	December	June
Calcutta	June	November
Muzaffarpur	October	March
Recruiting Committee, Northeast Frontier Railway	November	April

Each Railway Service Commission would ask the. Railways to give their indents 3 to 4 months before the issue of employment notice so that the number of vacancies is known by the time the examination is held.

205 The Recruiting Committee, Northeast Frontier Railway, in reply to the questionnaire, has stated that since the employment notices have invariably to show the number of vacancies in each division so as to enable the candidates to indicate their preference for two divisions as also the re-servation of posts, the issue of employment notices in respect of popular categories in November each year and the conducting of examination in April without waiting for the indents from the Railways concerned would not be advisable. In addition, as per ' orders of the Railway Board, the reservation of posts has also to be announced on the Radio where there is a concentration of scheduled castes and scheduled tribes. They are thus having misgivings about the feasibility of the new procedure.

206 There has so far been no reduction in the time taken for finalizing the recruitment to different categories of staff; on the contrary the time actually taken in most eases has been much in excess of the target. We will examine this matter further and advert to it in the subsequent report.

207 **Jurisdiction of Supervisors:-** (Recommendation 127- Part I) - The Wanchoo Committee observed that there were wide variations in the juris diction of various categories of supervisors on different Railways and that very little had been accomplished to bring about a measure of uniformity. They expressed the view that it was essential to evolve yardsticks in respect of jurisdiction of inspectors with local adjustments as may be considered necessary.

208 The Railway Board have informed us that the jurisdiction of traffic inspectors has been revised in conformity with the recommendations of the Kunzru Committee. Guidelines have already been prescribed regarding the jurisdiction of permanent way inspectors which are generally being followed. Uniform yardsticks for the provision of signal inspectors and carriage and wagon inspectors have been laid down for all the Railways recently, but no such yardstick has been laid down for loco inspectors.

209 The following broad guidelines were laid down for the jurisdiction of permanent way inspectors on the basis of a study made by the Efficiency Bureau of the Railway Board:—

(i) on broad gauge main and trunk lines, 110 to 125 equated track kilometers on single line sections, 150 equated track kilometers on double line sections, and 175 equated track kilometers on multiple line sections.

(ii) on meter gauge main and trunk lines, 95 to 105 equated track kilometers on single line sections; and 115 to 130 equated track kilometers on double line sections; and

(iii) on broad gauge and meter gauge branch tertiary lines, and narrow-gauge sections, 80 to 90 kilometers of route length.

These guidelines were issued before the introduction of high-speed trains co the Indian Railways. The last decade has seen considerable changes in track structure, methods of track maintenance and inspection. In view of these developments, it would be necessary to review the jurisdiction of permanent way inspectors. We will consider this matter further in the subsequent report.

210 Yardstick for signal and telecommunication inspectors was prescribed in March 1978, after a detailed study by Efficiency Bureau of the Railway Board. In the first stage the Railways have been asked to remove the disparities existing between different divisions on the Railways so as to ensure a uniform level of efficiency by rationalizing the jurisdiction and workload on the basis of their present sanctioned strength. A fair workload of a signal inspector has been indicated to be in the range of 3000 to 3600 Divisional Integrated Signal and **Telecommunication Units*** (DISTU) in case of non-suburban sections, and 5000 to 5600 units in the case of

centralized traffic control or suburban sections provided the signal inspector is relieved of some non-technical and miscellaneous work. In the second stage of implementation, the existing strength of signal inspectors will require to be augmented on the basis of the yardstick since their strength has not kept pace with modernization and in in signalling installations. Later in this report, we have gone into the question of inspections .by signal inspectors and find that on most Railways their strength is not sufficient to meet the workload obtaining. Obviously, the yardstick has not been implemented. If modern signalling which is now being extensively provided on the Railways is to serve its purpose effective, regular inspection aid proper maintenance thereof have to be ensured. We feel that having laid down a yardstick of workload for S&T inspectors, the Railway Board must take urgent steps to implement it within the shortest possible time.

211 The guidelines for requirements of carriage and wagon inspectors 'were laid down in December, 1976. According to these, the posts of carriage and wagon inspectors are to be calculated on the Zonal Railway basis and distributed to divisions according to the importance and work offering, taking into account the average holding of wagons (all gauges) in terms of 4-wheelers per day during one year and the ownership of coaches (all gauges) in terms of 4-wheeler units on the Railway. Besides one inspector has been suggested for each division for special type of stock, brake power, imprest stores etc., one inspector for special overhauls, progress of modifications involving safety and procurement and functioning of machinery and plant etc. and one superintendent for roller bearings, hot boxes, research, and development. The Railways have been asked to work out the

revised strength of posts on the basis. of the proposed guidelines, compare the same with the existing strength in various grades and indicate the modifications which may have to be made on this basis. They were advised that, if the application of the proposed guidelines requires creation/ upgradation of posts, the feasibility of making matching surrenders may also be indicated duly bringing out the details and the number of posts, grades, etc., which would be surrendered. Thus, the increase in the strength of carriage and wagon inspectors, where justified, has been linked with matching surrenders and additional supervisory staff as required has not been provided. Later in this report, we have commented on various aspects of maintenance of rolling stock which require to be improved in the interest of safety. We consider that for effective action in this regard, adequate strength of carriage and wagon inspectors must be provided. It is, therefore, necessary that the guidelines laid down for the strength of carriage and wagon inspectors are implemented without insisting on matching surrenders.

*Divisional Integrated Signal and Telecommunication Unit (DISTU) is a unit for expressing the maintenance workload of S&T equipment. It takes into account the quantum and dispersed of equipment level of utilization, interference to inspection and testing due to train service, and foot-plate inspection of signals.

212 As for the laying down of yardstick for the requirements of loco inspectors, the Railway Board had initially stated that norms were being worked out, but have later advised us that it is not considered opportune to tissue a uniform yardstick as there is A wide variation from railway to railway. Variations among railways are not uncommon in the case of other supervisory staff also and we do not consider this as sufficient reason for not laying down a yardstick for loco inspectors. We will

consider this matter further and advert to it in the subsequent report.

Permanent Way

213 The term `Permanent Way' is applied to railway track and consists of the combination of rails, sleepers, fittings, ballast, etc. Contrary to What may be implied by the term there is nothing permanent in the so-called `Permanent Way'. Every component of the permanent way requires to be maintained regularly and replaced periodically. Besides the attention which the individual components of the permanent way may require, the railway track as an assembly, has to be maintained in correct line and level within specified tolerances for the comfort and safety of rail travel. The attention

Which the individual component may require in the form of maintenance Would depend upon the traffic carried and the local conditions. The health of railway track is important not only from the point of view of safety and comfort of rail travel but it also contributes significantly to the life of rolling stock and, locomotives as also to the life of individual components of the permanent way.

214 The decade since the appointment of the Wanchoo Committee has boon considerable increase in traffic density, speed of trains and change in the pattern of traffic due to the use of rolling sock with high axle loads and improved form of traction using diesel and electric locomotives. The burnt +of these developments has to be borne by the permanent way. To meet the new requirements the older materials are being replaced by

new heavier and improved rails and sleepers with elastic fastenings for holding the rail on the sleepers. The conventional fish plated track with joints every few meters which contributed to the clackety-clack' of rail travel, is now giving place to long and continuous welded rails. Together with improvement and modernization of the permanent way constituents, the methods of track maintenance and inspection have seen considerable change and improvement. Maintenance with heavy on-track machines and directed track maintenance have been introduced in a big way. Major strides have also been made in the inspection and monitoring of track by mechanized means. It is in this background that we have reviewed the implementation of the recommendations made by the Wanchoo Committee on permanent way.

215 The Wanchoo Committee had made 64 recommendations and observations on the 'Permanent Way' in their report. Out of these, we find that item 147 of Part I is an observation and did not call for any action. Items 148 and 152 of Part I and 88(i), 89, 90, 91(i) and (ii), 92, 103, 104, 106, 107, 108, 109(i), (ii), (iii), 110(iv) and (v) and 112 of Part II are either factual in nature or have been implemented or appropriate action taken by the Railway Board. However, these items are pined in the Appendix to this report together with the views of the Railway Board and action taken thereon by them. In respect of the remaining recommendations of the Wanchoo Committee, our detailed review of implementation is given in the following paragraphs.

216 **Track Structure: —** (Recommendation 84- Part II) —The Wanchoo Committee considered that, for providing a modernized track structure, 60 Kg. /m rails should be laid not only on sections carrying more than 20 gross million tonnes traffic but also on other' trunk routes where the density of traffic may not have reached that level but may be rapidly increasing.

217 In their remarks, the Railway Board have stated that, for achieving modernization of track from the point of safety, it was not necessary to use 60 Kg./m rails. They added that the Use of heavier rail section has an economic aspect as renewals would be at longer intervals and that this consideration would be the determining factor for use of 60 Kg/m rails on a particular section. The Railway Board have also advised us that, on the basis of the recommendations made by a Committee of Directors of the Railway Board and RDSO, Chief Engineers of Railways and Additional Commissioners of Railway Safety who had reviewed the track standards on broad gauge in 1972, minimum rail sections were laid dawn depending upon the traffic density and speed which are given in Table 33 below—

TABLE 33
Minimum Rail Section

Traffic density in gross million tonnes	Speed		
	100 Km/h and below	Over 100 Km/h and upto 160 Km/h	Over 100 Km/h and upto 160 Km/h
Over 20	60 Kgm	60 Km/m	52 Kg/m
From 10 to 20	52 Kg/m	52 Km/m	52 Kg/m
Under 10*	90 lb/yd	52 Km/m	52 Kg/m

*For suburban sections 52 Kg/m rails will be used even for the sections where traffic density is 10 GMT.

218 It would thus be seen that the recommendation of the Wanchoo Committee for use of 60 Kg./m rails on sections where the density of traffic may not have reached 20 gross million tonnes but maybe rapidly increasing had not been accepted by the Railway Board.

219 In their replies to the questionnaire of the Committee, some of the Railways have stated that even though minimum track standards for trunk routes and main lines have been laid down there are sections, carrying a large number of high-speed trains where the track structure remains below the stipulated standard. One railway has suggested laying down of standards for ghat sections to counter the heavy wear. Another railway has stated that the track structure in some of the good's yards consisting of 75 lb/yd double headed rails and D&O sleepers having a sleeper density of N+]1*, does not meet the requirements for carrying the existing rolling stock.

*N+1is an expression used for the density of sleepers in railway track; it implies the number of sleepers will be 14+1=15. Presently the expression M+1 is in use where 'M' is the length of rails in meters.

220 It is necessary that the track structure is brought, up to the stipulated standard at the earliest. We propose to go into it in detail and advert to it in the subsequent report -

221 **Welding of rails.—** (Recommendations 142—Part I and 85 Part II)— The Wanchoo Committee commended the progress made in the welding of rails and hoped that the pace would be maintained and even further accelerated. They, however, noted that the progress of 192

kilometers of long welded rails laid up until 31-3-1968 was not a significant achievement and hoped that adequate and timely action would be taken for extensively going in for long welded rails.

222 The Railway Board have informed us that during the last ten years the pace of welding of railway tracks has been accelerated and substantial progress has also been made in the laying of long welded rails. The progress made in this respect is given in Table 34 below: —

TABLE 34

Progress of Long/Continuous Welded rails

Position as on	Aggregate length of welded track	length of track laid with long/continuous welded rails
	(In Kilometers)	
31-3-1962	4625	..
31-3-1968	15220	192
31-3-1978	33900 (33509)	5200 (5382)

Note: Figures within brackets give the position as advised to us by the Railways which is given in Annexure XI

223 We commend the progress of welding of railway tracks and laying, of long/ continuous welded rails made during the last decade and 'hope that this will be kept up. The Railway Board have also informed us that during the five-year period 1978-83, it is programmed to lay about 8000 kilometers of long (continuous welded rails and another 5250-kilometers short, welded panels on the trunk routes and main lines of 'broad and meter gauges.

224 In reply to the questionnaire of the Committee, the Railways have advised us the progress of welding of rails and laying of long continuous welded rails. This information is given in Annexure XI. We are 'happy to note that considerable progress in the laying of long! continuous welded rails has been made on the Central and Northern Railways followed by the Eastern and Western Railways. On the Southern and South 'Central Railways, the progress in. this respect has not been commensurate 'with their track kilometrage and would need to be accelerated. The South-Eastern, North-Eastern and Northeast Frontier Railways have a relatively larger proportion of fish plated track and we would. urge these Railways to take effective steps for the welding of rails expeditiously.

225 **Procurement of Wooden Sleepers-** (Recommendation 143—Part I)—The Wanchoo Committee observe that there was as overall shortfall in the procurement of wooden sleepers on both the broad and meter gauges over the earlier 4 years. They suggested that allocation or wooden sleepers for renewals in automatic signalling territory, at stations provided with route relay interlocking or truck-circuited running lines on both broad and meter gauges as also other similar works, should be made on priority. They also suggested that through renewals of wooden sleepered track on non-track-circuited sections should be carried out with CST-9 or steel trough or pre-stressed concrete sleepers and the released serviceable second-hand wooden sleepers used for random renewals.

226 The Railway Board have stated that considering the limited supply of wooden sleepers, their use is being restricted to track circuiting works at stations, level crossings, for sections where automatic train control centralized traffic control, colour light signalling, tokenless block working and mechanization of hump yards etc. are required to be provided, for gauge conversion projects, new lines laid on unconsolidated formations and for normal maintenance of track with wooden sleepers They have also stated that in view of the above mentioned limitation and due to the limited supply of steel sleepers, the Railways have been advised to plan new track works with the use of CST-9 sleepers to maximum extent. Increasing length of track on important trunk routes (Group 'A' and 'B' routes) on broad gauge is being laid with concrete and steel sleepers. In their comments, the Railways have generally stated that scarcity of wooden sleepers persists and that the use of wooden sleepers in non-track circuited sections has been brought down to the minimum-The annual track renewal programme is mostly being done with metal and concrete sleepers depending upon the route and density or traffic. The Railways have also furnished us information regarding the requirement and supply of broad and meter gauge wooden sleepers during the last five years. This is given in Annexures XII and XIII. It will be seen that during the period 1973-74 to 1977-78, only about 41 per cent of requirement of broad-gauge wooden sleepers and about 50 per cent of the requirement of meter gauge wooden sleepers were actually supplied. Supplies made to the Western Railway were the lowest of all railways, the. percentages

being only 29 and 22 for broad and meter gauge sleepers respectively.

227 As mentioned later in paragraph 382, the Railways have advised us that works of track circuiting have received a setback due to inadequate availability of wooden sleepers. The Central Railway has stated that due to Shortfall in supply of wooden sleepers, as compared to the requirement on all-India basis, arrears are bound to be there both in track circuiting, and other track renewal works. They have suggested the use of axle counters to reduce the requirement of wooden sleepers for track circuiting and use of concrete sleepers for through renewal of wooden sleepered track especially on the Bombay Division.

228 From the foregoing, it is quite clear that the supply position of wooden sleepers has not at all been satisfactory. The forecast for their supply in the future also does not appear encouraging due to dwindling forest resources. Having regard to these considerations, the Railways will have to rely more and more on other types of sleepers and alternative means like axle counters for track circuiting etc.

229 **Procurement of Concrete Sleepers:—** Recommendations 141— Part I, 86 and 87—Part II)— The Wanchoo Committee urged the Railway Administrations to make special efforts for introducing the precast concrete sleepers on the Railways on an extensive scale in view of the unfavourable supply position of wooden 'sleepers and the increasing demand for modern signalling. They reiterated the

need for a firm and long-term integrated plan for the procurement of concrete sleepers and matching elastic fastenings and synchronizing their supply, so that the plan of modernization of track did not suffer on this account.

230 In their remarks, the Railway Board have stated that concrete sleepers for railway track have been developed and all-out efforts are being made 'to arrange pre-cast concrete sleepers in as large numbers as is practicable. Ten concrete sleeper factories have been established of Which six are in production and the remaining four are likely to commence production shortly. They have added that action has also been taken to install ten more such factories. Regarding synchronization of supply of elastic fastening and concrete sleepers, the Railway Board have stated that necessary action has already been taken and that it is unlikely that the supply of elastic fastenings will lag behind the supply of concrete sleepers or vice-versa.

231 The Railway Board have furnished information regarding the length of track laid with concrete sleepers during the 5-year period 1973-78. This is given in Annexure XIV. The summarized position is shown in Table 35 below—

TABLE 35

Year	Length of track laid with concerts sleepers (in kilometers)
1973	9.5
1974	11.4
1975	36.6
1976	72.2
1977	90.8
1978	88.5
Total 1973-78	**309.0**
Yearly Average	**51.5**

232 We are constrained to note that the average annual progress of laying concrete sleepers during the period 1973-78 had been only 52 kilometers which was 5 per cent of the length of primary sleeper renewals done on the Railways during the said period. The supply of concrete sleepers has not built up during the last decade as was envisaged by the Wanchoo Committee and their recommendation in this regard, therefore, remains substantially unimplemented.

233 The Wanchoo Committee had also envisaged the use of concrete sleepers as an alternative to wooden sleepers for track circuiting. There has, however, been very little progress in the use of concrete sleepers in track-circuiting. We understand that due to the unsatisfactory electrical resistance of the present designs of concrete sleepers their use in track circuiting works has been permitted with reservations. The length of track circuit with concrete sleepers is expected to be less than the length normally permitted with wooden sleepers. This would unduly increase the number of track circuits, relays and accessories and play _a restrictive role on the wider use of concrete sleepers particularly on trunk routes where long welded and continuous. welded rails are proposed to be used. Concrete sleepers are being extensively used on foreign railways on track circuited sections. and to make the same a reality on the Indian Railways, the present technical handicap would need to be tackled with a sense of urgency.

234 Having regard to the fact that the Ministry of Railways are committed to the provision of track circuiting on a programmed basis and noting that not enough. wooden sleepers

would be available., we feel that unless greater efforts are made in regard to the procurement of concrete sleepers, it is unlikely that any significant progress can be made in future. For this purpose, it is also necessary to develop concrete sleepers which can be used for track circuiting without any restrictions or reservations.

235 Provision of guard rails and walk-ways on bridges:— [Recommendation 88(ii)—Part II]— The Wanchoo Committee observed that the work of providing guard rails on girder bridges on some small spans of pre-stressed cement concrete girders had yet to be completed. Instead, guard rails had been provided on earth-cushioned arch and flat top bridges and culverts which, in their view, served no purpose. Nor were the guard rails fixed according to the instructions issued by the Railway Board. They observed that walkways made out of unserviceable sheets had not been provided on all the girder bridges.

236 In their remarks, the Railway Board have stated that the deficiencies have been made good. From the comments of the Railways, we find that the Central Railway is providing guard rails on all girder bridges where the consequences of derailment are likely to be serious. The Eastern Railway has 'stated that guard rails are being provided where necessary and deficiencies are being taken up with the divisions, The South Central Railway is providing guard rails on those of the minor girder bridges only which have clear span of more than 6.1 meters (20 feet), and where simultaneously the rail level to bed level is more than 3.05 meters (10 feet). Walk-ways on girder bridges are not

normally being provided on all girder bridges on the Eastern Railway and on the Northeast Frontier Railway, these are provided on major bridges only. A few bridges on the Nilgiri section of the Southern Railway have also not been provided with footpaths.

237 From the foreging it will be seen that the above recommendation has so far not been fully implemented on all the Railways. We hope that Railway Board will ensure that all girder bridges, on all the Railways, are provided with guard rails and walk-ways, without exception, within a short period.

238 **Deficiencies in proper maintenance of level crossings.—** [Recommendation 88 (iii)—Part III— During the course of their inspections of railway track, the Wanchoo Committee inspected a number of level crossings. They observed that at some of these, gate lamps were without masking arrangements, road approaches at 'C' class level crossing, were steeper than the limiting grade of 1 in 20, the discs fixed to gate, shutters were not painted bright red and the catches and stops for gate shutters were ineffective. They stated that though their observations were necessarily of a limited nature, these would be applicable to most of the track and that a lot needed to be done to improve the general standard of maintenance.

239 In their comments, the Railway Board have advised us that instructions for the upkeep of level crossings are adequately covered in Indian Railways Way and Works Manual which are being

followed by the Railways. The Railways have also commented that level crossings are regularly inspected according to the schedule of inspections and that action is being taken for their proper maintenance. They have stated that masking arrangements for gate lamps have been provided, road approaches. are being maintained to the specified grade wherever they are steeper and painting of discs and repairing of gate catches is also being attended to.

240 On the other hand, we find from the annual reports of the Commission of Railway Safety that considerable deficiencies in the maintenance and equipment of level crossings were observed by the Additional Commissioners of Railway Safety during their inspections. They had also noted that the gatemen, on duty were not found quite conversant with the rules and procedure for protection of track to he followed in an emergency. In the Annual Report for 1976-77, the Commission of Railway Safety observed that the standard of maintenance of level crossings was not up to the mark. It was, stated that the level and gradient portions of approach roads beyond gate posts, particularly at unmanned level crossings, were not being maintained as per standards laid down in the Indian Railways Way & Works Manual. We also find that the Railway Board had on a number of occasions drawn the attention of the Railways to the deficiencies in the maintenance and equipment of level crossings which had come to their notice.

241 Notwithstanding the assurances given by the Railways, we find that deficiencies still remain in. the maintenance and equipment of level crossings and in the training of gatemen in safety

procedures. In view of the heavy toll of life and limb that accidents at level crossing take, their proper maintenance and training of gatemen in the protection of-Tail and road traffic cannot be over-emphasized. It is important, therefore., that the Railway Administrations give high priority to remedying this situation.

242 Ballast Diagrams:—

(Recommendation 93(i), (ii) & Part III—The Wanchoo Committee found that there was lack of uniformity in the preparation of ballast diagrams on the Railways. They considered that screening of ballast between two sleepers should be. done at every quarter of kilometer, taking care that the cores under the sleepers were not disturbed and the results should be plotted on a diagram showing the. clean stone ballast content in the track. They also suggested tat ballast diagrams should be revised once in five years or so and the engineers should test-check the requirements of ballast worked out by permanent way inspectors on the basis of the ballast diagrams.

243 In their remarks, the Railway Board had stated that the requirements of ballast for maintenance: purposes. was estimated by screening the ballast section every half or one kilometer as laid down in. the Indian Railways Way & Works Manual. The requirements worked out by the permanent way inspectors in this manner are checked by the Assistant Engineers. They stated that the ballast diagrams referred to by the Wanchoo Committee are maintained as a record to show the. depth of clean/unclean ballast under the sleepers but these are not utilized for estimating the maintenance requirements of

ballast. However, ballast diagrams are used for estimating the ballast requirements only at tile time of deep screening. In their comments, the Railways have also stated that ballast cushion diagrams are being maintained. On some Railways information pertaining to ballast cushion is indicated on the track diagram. Nothing, however, appears to have been stipulated regarding the periodicity at which the ballast diagrams should be revised. In effect, this recommendation of the Wanchoo Committee does not seem to have been accepted by the Railway Board and the earlier practice on the Railways continues. We wish to examine this matter further and will advert to it in the subsequent report.

244 **Percentage of clean ballast in track**.— (Recommendation No. 94—Part II)—The Wanchoo Committee considered clean ballast to be a vital factor in safe and satisfactory behaviour of the track and suggested that wherever the content of clean ballast falls below 35 per cent, complete re-ballasting should be carried out.

245 In their remarks, the Railway Board stated that clean ballast in track was essentially required for facilitating drainage which was achieved by cleaning the haunches regularly. They added that the interval after which the haunches require cleaning depends on local soil conditions but, generally speaking, one cleaning every three years is considered adequate. Deficiency in ballast in boxing is made up at the time of such cleaning. They also stated that deep screening including provision of full ballast cushion is carried out at the time of track renewal. Deep screening and recoupment of ballast in between track renewals

is done on the basis of actual requirements which vary from place to place depending on the soil conditions, rainfall in the area and traffic density. The Railway Board considered these methods adequate for ensuring sufficient clean ballast in track and the fixing of specific percentage, as was suggested by the Wanchoo Committee, was not considered necessary. We are in the agreement with the Railway Board that no specific percentage of clean ballast for undertaking complete re-ballasting need be laid down. Maintenance recoupment of ballast is a continuing process for the proper upkeep of track and such recoupment should be done on the basis of actual requirements.

246 Ballasting of Track.— (Recommendation. 145—Part I)- The Wanchoo Committee observed that deficiency of clean ballast was manifest on many sections. They noted that, during the 5-year period from 1963-64 to 1967-68, procurement of ballast had been of the order of 5 million cubic meters per annum which amounted to about 6 per cent of the total ballast in track on the broad, meter and narrow-gauge systems. They felt that greater efforts were called for to enhance the. procurement of clean ballast from 5 to 9 million cubic meters per annum.

247 In The Railway Board stated that in accordance with the recommendations made by the Kunzru Committee (Para 144 of Part II Report), 4 per cent of the total quantity of ballast in track was considered adequate for annual recoupment. The total quantity of ballast on running lines on the broad, meter and narrow-gauge systems, as on 1.4.1967, was estimated at 64 million cubic meters. Four per cent of this quantity would be 2.8 (sic) million cubic meters. They added that during the period 1963-

64 to 1966-67 when the total procurement of ballast was about 5 million cubic meters per annum, ballast trained out for recoupment purposes varied from 2.1 to 2.6million cubic meters per annum. Thus, the recoupment target of 2.8 million cubic meters had generally been fulfilled. The Railway Board have also advised us that adequate quantity of ballast is being procured by the Railway-3 to meet the annual requirements for normal recoupment, track renewals and increasing the ballast cushion.

248 In reply to the questionnaire of the Committee, the Railways have furnished the quantity of ballast procured annually during the last five years. These figures for the period 1973-74 to 1977-78 are given Annexure XV. During this period, the total quantity of ballast procured on all Railways averaged 2.68 million cubic meters per annum. Some portion of the total quantity of ballast so procured must have been used on works of track renewals and increasing ballast cushion. Therefore, there is no doubt that the quantity of ballast used for recoupment has considerably fallen short of even the Railway Board's own assessment of 2.8 million cubic meters per annum. Information furnished by the Railways shows that some Railways have shortfall while others have none. The information given by the Railways does not corroborate the conclusion of the Railway Board that adequate quantity of ballast is being procured for recoupment and put in the track. The Railways have indicated reasons for the shortfall as shortage of funds, non-availability of ballast and difficulty in training it out. We do not consider as adequate, the reasons given by some of the Railways for not carrying out an important work on which depends the effectiveness of track maintenance and health of the track. This recommendation of

the Wanchoo Committee, therefore, has not been fully implemented. The Railway Board should take urgent steps to see that the procurement of ballast is increased to meet fully the requirements for normal recoupment.

249 **Track Renewals.—** (Recommendation 141—Part I).— The Wanchoo 'Committee commended the progress made on track renewals during the period 1963-64 to 1967-68 and hoped that the pace of renewals would be maintained. They noted that on the broad and meter gauge systems, the length of track under speed restriction had undergone a steady reduction during the period 1963-64 to 1966-67 and expressed the hope that speed restrictions attributable to worn out or obsolete track would continue to be eliminated and the trend of progress achieved would be maintained.

250 In their remarks, the Railway Board stated that track renewals are carried out on condition basis depending on the resources available and that all possible efforts are made by the Railways to replace worn out or obsolete track with a view to remove speed restrictions. The Railway Board have advised us that, due to steep increase in the cost of labour and materials since 1969 and inadequate outlays for track renewals, the actual length of track renewed has been declining over the years with consequent increase in the backlog of primary renewals. The average annual outlay and progress of track renewals during the plan periods were as shown in Table 36

TABLE 36

Period	Average Annual net outlay (in crores of Rupees)	Average Annual Progress of complete Track Renewals (in kilometers)	
		Primary	Secondary
Second Five-year Plan (1956-61)	30.05	1900	530
Third Five-year Plan (1961-66)	43.05	2600	620
Three Annual Plans	29.30	1700	500
Fourth five-year Plan (Four years 1947-78)	31.64	1300	360
Fifth Five-year Plan (Four years 1974-78)	35.07	950	290

251 The Railway Board also stated as a result of inadequate outlays the backlog of primary renewals which was of the order of 2400 kilometers at the beginning of the Fifth Five Year Plan had increased to about 6000 kilometers in 1978 and speed restrictions have had to be imposed on about 1700 kilometers due to weak track structure. They have added' that considering the backlog and the normal annual extent of track renewals, the requirement of funds during the five-year period 1978-83 has been estimated at Rs. 560 crores (net), against which a tentative provision of only Rs. 350 crores (net) has been made.

252 In reply to the questionnaire of the Committee, the Railways advised the progress of primary through rail and sleeper renewals for the ten year period from 1968-69. This is given in Annexures XVI

and XVII. it will be seen that the progress of primary through rail and sleeper renewals has been continuously falling since the Third Five Year Plan. During 1977-78 the track renewals completed were only 37 per cent of the annual performance during the Third Plan period.

253 In Due to fall in the annual track renewals the arrears in this respect have been mounting. The position of arrears of track renewals as on 1st April 1978. advised by the Railway Board for the broad, meter and narrow gauges is given in Annexure XVIII. The summarized position is as per Table 37 below: —

TABLE 37

Arrears of Track Renewal

	Total length of track	**Arrears in Track Renewal as on 1-4-1978**			
		Through Rail Renewal		**Through Sleeper Renewal**	
		Primary	**Secondary**	**Primary**	**Secondary**
			(in Kilometers)		
Broad Gauge	49522	4001	1360	4234	1186
Meter Gauge	25926	3416	2145	3843	1419
Narrow Gauge	4293	13	1195	68	1218
Total	**79741**	**7430**	**4700**	**8145**	**3823**

254 We find from Annexure XVII that bulk of the arrears in primary have been' mounting. The position of arrears of track renewals as on and main lines which carry major portion of the traffic. Out of 25342 kilometers of track on* Groups 'A', '13' and 'C' routes of broad gauge, primary through rail and sleeper renewals were due on 3139 and 3435 kilometers respectively. On the meter gauge, out of 14554 track kilometers on track routes and

main lines, primary through rail and sleeper renewals were due on 2739 and 2641 kilometers respectively. The main reasons for the increasing arrears in track renewals have been stated by the Railways as inadequate 'allocation of funds and non-availability of permanent way materials.

*Railway lines on broad gauge of the Indian Railways are classified into Groups A, B, C, D, and E on the basis of maximum permissible speed.

255 The Railways have had to impose speed restrictions at several places on considerations of weak and obsolete track overdue renewal. The extent of such speed restrictions as on 31-3-1978 are given in Annexure XIX. The length of track under speed restrictions due to obsolete or worn-out track has increased from 788 kilometers on 31-3-1968 to 1996 kilometers on 31-3-1978. The Eastern Railway has advised us that so far, they have been able to restrict the imposition of speed restrictions to a comparatively few sections by making an all-out effort to maintain the present track with casual renewals, but this cannot continue much longer and additional speed restrictions would have to be imposed soon if the pace of track renewal is not stepped up.

256 From the review made in Chapter II, we find that the number of accidents attributed to rail breakages has increased substantially in recent 'years. As mentioned later in paragraph 278, rail fractures on running lines have also gone up and the delays in track renewals would have contributed to this in some measure.

254 The Wanchoo Committee had expressed the hope that the Railways will step up the pace of track renewals and bring down the backlog, Not only has this hope been belied, but the position has

deteriorated considerably and \ its ill-effects are becoming apparent from the rising incidence of rail breakages and imposition of speed restrictions on increasing lengths of track. We view this matter with great concern and would strongly recommend That no effort should be spared in solving this problem in all its aspects. It is disconcerting to note that, against Railway Board's own estimate of the requirements of funds for track renewals of Rs. 560 crores during the quinquennium 1978-83, only Rs. 350 crores are stated to have been tentatively earmarked for this purpose. We understand that this matter has also been taken up by the Railway Board with the Planning Commission. We do hope that the Railways' full requirements of funds for' track renewals in the coming years will be made available so that the arrears are wiped out at the earliest. We shall advert to this subject in oar' subsequent report.

258 The Northeast Frontier Railway has advised us that two branch lines owned by private companies and worked by them, i.e. Chaparmukh-Silighat (83.61 Kms.) and Katakhal-Lalaghat (38.10 Kms.) are being maintained with great difficulty at a restricted speed of 25 kmph and 15 kmph respectively, due to overdue track renewals, as the concerned company is not willing to share the cost of replacement. Site this is an important matter concerning the safety of train operation, we would like to impress upon the Railway Board the need to take special' steps to complete track renewals on the above-mentioned lines on an urgent basis.

259 **Unserviceable sleepers in track.—** (Recommendation 95—Part II) The Wanchoo Committee observed that, with unserviceable wooden sleepers spread indiscriminately over the track, rails and rail joints as well as serviceable sleepers are subject to stresses and suffer damage. They suggested that the percentage of unserviceable wooden sleepers should be reduced to the barest minimum and eventually any sleeper that is considered spike-killed or otherwise unserviceable should be promptly renewed.

260 In their remarks, the Railway Board had stated that the extent policy was in conformity with this recommendation. The Zonal Railways have commented that efforts are being made to keep the percentage of unserviceable sleepers in the track to the minimum possible but inadequacy of funds and of wooden sleepers have been the constraints. From the replies of the Railways to the questionnaire of the Committee, we find that as on 31-3-1978, there were 9174 kilometers of track where the proportion of unserviceable sleepers was in excess of 20 per cent. A major portion of such track would be on wooden sleepere.d sections. Thus, while the Wanchoo Committee had suggested reduction in the percentage of unserviceable sleepers to the barest minimum, we find that a significant length of track continues to have more than 20 per cent unserviceable sleepers. This recommendation has, therefore, not been implemented. We propose to go into the question of number of unserviceable sleepers in track and distribution thereof and shall advert to it in the subsequent report.

261 **Distressed Bridges.—** (Recommendations 96 and 97—Part II) — The Wanchoo Committee observed that the Railways did not have a clear concept of what the term 'distressed' bridges implies. They recommended' that there was need for having a uniform concept as to when a bridge was to be treated as 'distressed' on condition basis or on hydrological considerations. They also urged that bridges considered 'distressed' should be rehabilitated on a programme basis, a higher priority being given to structures which require to be rebuilt on age-cum-condition basis.

262 In their remarks, the Railway Board stated that guidelines and general instructions for inspection and maintenance of bridges already exist and that further amplification of such instructions, with a view to achieving uniformity, was not considered desirable since it would act as a constraint on local engineering officials. They added that rehabilitation of distressed bridges was being undertaken as per extent policy.

263 In reply to the questionnaire of the Committee, the Railways have furnished information regarding bridges considered 'distressed' on a condition basis or on hydrological considerations. This is given in Annexure XX. It will be seen that up to the end of 1977-78, the number of bridges which had been identified as 'distressed' totalled 4847. Out of these, 1294 bridges were rehabilitated during the decade of form 1968-69 to 1977-78. Thus, there were 3553 `distressted' bridges remaining to be rehabilitated as on 31-3-1978. The largest number of 921 'distressed' bridges were on the North-Eastern Railway, followed by Northeast Frontier Railway with 833 such

bridges. Railways have also pointed out that categorization of bridges as 'distressed' on condition basis or otherwise is a continuing process and it is likely that more bridges may fall in this category in due course.

264 Against 1247 bridges treated as distressed at the time of the Wanchoo Committee, the number over a period of 10 years has increased to 3553. The sharp increase in the number of 'distressed' bridges is disquieting. A special programme designed to complete the rehabilitation of these bridges within a specified time is, therefore, called for.

265 From the replies of the Railways we also note that the, term `distressed bridge' is being given widely different connotations. For instance, the Eastern Railway has categorized those bridges as 'distressed' which are either showing signs of distress or have early steel or under-strength girders. The Northern Railway has termed those bridges as 'distressed' which fall in one or more of the three categories viz (i) bridges with understrength girders having speed restriction on that account, (ii) arches having cracks and where grouting has not given satisfactory results and (iii) bridges having cracks in piers, abutments and bed blocks. The Northeast Frontier Railway has categorized theoretically overstressed bridges as 'distressed', besides those which are physically or hydrologically distressed'. Thus, a uniform concept of what a 'distressed bridge' implies is still lacking. We consider that, for a correct appreciation of the magnitude of the problem of rehabilitation of 'distressed' bridges, a definition of the form 'distressed bridge' is called for.

266 Gang Strength.— [Recommendations 98(i) to (v) and 99-Part II]— The Wanchoo Committee recommended that the Track Standards Committee should go into the matter of gang strength and evolve a system of basic strength units according to track classification. These basis strength units may be augmented by co-efficient based on local characteristics of various sections of the Railways. They suggested that while evolving the basic strength of a gang, the working and living conditions of gangmen should not be ignored. They also suggested that the gang strengths should be determined on a careful consideration of the following: —

(i) optimum standard of maintenance for each classification of track based on the maximum speed and traffic density.

(ii) schedule of work 'round the year' for the required optimum standard of track maintenance.

(iii) assessment of the requisite number of man-days, based on average outturn of work per man-day for each operation to conform to the specified 'round the year' schedule.

(iv) additional strength required to cover such factors as require extra attention over and above the normal; and

(v) the optimum length over which a given gang can carry out effectively and without default every track maintenance operation.

267 From The Railway Board have stated that the factors enumerated by the Wanchoo Committee, along with other relevant factors such as method Of inspection, extent of mechanization etc.

are taken into account in determining the gang strength. The Railway Board also appointed an Expert Committee in 1969 to report on the requirements of staff for maintenance of track on different gauges with varying track structure and under different systems of maintenance. The Expert Committee suggested a formula for determining the gang strength for manually maintained sections only, opt the same lines as was done by the Lobo Committee earlier with some modifications in the factors which affect the quantum of maintenance effort required. The Export Committee did not consider it possible, for want of experience, to evolve any yardstick of work for staff working on sections maintained mechanically or by other modern techniques. The Railway Board, therefore, appointed a Directors' Committee December, 1971 to examine certain aspects of the Expert Committee's report before it was accepted for implementation on the Railways. The Directors Committee did not accept the recommendation made by the Export Committee and suggested that it would be generally adequate to continue the use of Lobo Committee's Modified Maflin formula with certain adjustments. The suggestions made by the Directors' Committee were discussed at the conference of Chief Engineers held in January 1976. They noted that the effects of directed track maintenance, use of concrete sleepers etc., had not been taken into account while working out the gang strength formula. To review these developments and fix a revised yardstick on a more scientific basis, a Committee (hereinafter referred to as the Gang Strength Committee) consisting of Chief Engineers of five Railways and officers from the Railway Board and the RDSO, has been constituted in January, 1976 and they have been entrusted with the work

of evolving a suitable formula for gang strength required for track maintenance.

The Railway Board have advised us that the yardstick on gang strength for track maintenance was revised in 1962 (Modified Malin formula by Lobo Committee), subsequent to which there have been major changes in track structure on the Indian Railways. There have also beat improvements in the methods of track maintenance with the introduction of mechanical tamping, long welded rails, etc. These are under re-examination by the Gang Strength Committee whose report is expected soon. They have added that safety in the maintenance of track is in no way undermined with the existing gang strength.

268 From the foregoing we find that the evolution of a rational formula for determining the gang strength has been considerably delayed and the Wanchoo Committee's recommendation remains unimplemented. The Railway Board should direct the Gang Strength Committee to submit its recommendations expeditiously and finalize the issue speedily.

269 **Maintenance of 'curves:—**

(Recommendations 146- Part I; 100, 101 and 102—Part II)— The Wanchoo Committee observed that the maintenance of curves to correct alignment including transitions, with appropriate superelevation and can't gradient in proportion to the optimum versine gradient, needed special care. They found keenness among the permanent way staff on different Railways for having mechanized means of maintaining the curves to correct alignment and in this context referred to two instruments

namely, the curve calculator and the curve corrector. They suggested that the Railway Board may consider the question of procurement of an adequate number of curve correctors so that an instrument was available for each division on the Railways. They also suggested that after accurate reconditioning of each curve with special emphasis on the transitional approaches, curve alignment registers should be maintained showing therein the versine's and super-elevation at each `station'.* The `stations' should be marked in white paint on the inner side of the outer rail and the superelevation on the inner web of the inner rail.

*Note: To enable measurement of versine's on curved track, it is divided into small segments, each 10 meters long etc. The end points of these segments are referred to as 'stations'.

270 In their remarks, the Railway Board stated that curve alignment registers are being maintained and the 'stations' are marked on curves. Mechanized curve calculators are already in use and at present there are 21 entire calculators on the Railways, the utilization of which is controlled from the Head-quarters Offices.

271 We note that the Committee of Directors, Chief Engineers and Additional Commissioners of Railway Safety on Review of Track Standards (Broad Gauge) 1972 considered curve correctors as very useful for continuous recording of versine's along a curve and for locating the areas needing immediate attention. They recommended that this should be Railway Board did not accept this recommendation initially since they considered that it would be difficult to use curve corrector on busy lines and recording of versine by manual method was considered satisfactory. On the strength of

results of trials conducted with imported `Matisa' curve corrector, the RDSO advised the Railway Board in March 1976 that the curve corrector is an extremely useful equipment for obtaining smooth alignment on curves without the need for elaborate calculations involved in string lining. They considered it a versatile tool in the hands of permanent way men for improved maintenance of curves. The RDSO had advised that field trials over the Western Railway had also proved the usefulness of this equipment. On the above recommendation of the RDSO, the matter was reconsidered by the Railway Board 'and instructions were issued to the. Railways in May 1976 to use curve correctors on certain sections where they consider it necessary for better maintenance of track. The RDSO were also asked to develop a curve corrector indigenously and supply one or two curve correctors to each Railway. We understand that the RDSO are working on the indigenous development of this equipment.

272 From the foregoing we find that the recommendation of the Wanchoo Committee for making available one curve corrector on each division is still to be implemented. The usefulness of the curve corrector having been proved in field trials, we consider that the Railway Board should take steps to expedite its development and make them available on each division of the Railways.

273 **Ultrasonic rail flaw detectors: —** (Recommendation 105— Part II)— The Wanchoo Committee considered that ultrasonic rail flaw detectors were essential for detection of rail flaws and urged that an adequate number of these should be made available for use on the Railways. They expressed the view that annual testing provides an effective practical check, though more frequent testing should be carried out where track conditions so warrant.

274 The Railway Board in their remarks stated that the periodicity of inspections by ultrasonic rail flaw detectors would be as warranted by track conditions. They also stated that 40 ultrasonic rail flaw detectors are in use on the Indian Railways, that orders have been placed on M/s. Electronics Corporation of India Ltd., Hyderabad for supply of 50 rail flaw detectors out of which 30 have been received and are in use and action has been initiated to procure another 37. They added that the schedule of ultrasonic testing has been laid down keeping in view the importance of the route and life of the rails, and that more frequent testing will be possible on receipt of additional' rail flaw detectors as indicated above.

275 From We note that the Railway Board had accepted the recommendations of the Committee of Directors, Chief Engineers and Additional Commissioners of Railway Safety on the 'Review of Track Standards (Broad, Gauge)-1972' that in-service testing of rails should be done at the following periodicity-

a	For lines with speeds in excess of 130 kmph.	Once in a year
b	For lines with speeds in excess of 100 kmph. and up to 130 kmph.	Once in two years
c	On all suburban running lines where the speeds are up to 130 kmph.	Once in two years

The chief Engineers of Zonal Railways have been given the discretion to permit testing at closer intervals.

276 From In their comments, the Railways have stated that ultrasonic rail flaw detectors are being used for testing of rails wherever required. From the information furnished by the Railways we are happy to note that in recent years about 10,000 kilometers of tracks per annum were tested ultrasonically. This is a commendable performance.

277 From the foregoing we find that though annual testing by ultrasonic means has not been introduced on all tracks, substantial progress in this direction has been made. Due to the increasing arrears in track renewals and rise in the incidence of rail breakages, we consider ultrasonic testing an essential and effective means of ensuring safety and efficiency of train operation. We hope that, with the receipt of additional rail flaw detectors, not only will the periodicity of testing be increased but increasing length of track will be covered by ultrasonic testing.

278 **Incidence at rail failures.—** (Paras 260 to 262—Part II)—In reply to the questionnaire of the Committee, the Railways have furnished information regarding number of rail fractures

on running lines during the decade ending 31-3-1978. This has been given in Annexure XXI. For the purpose of comparison, the number of rail fractures which occurred during the five-year period from 1963-64 to 1967-68, which was reviewed `by the Wanchoo Committee (Para 261—Part II report), have also been shown in Annexure XXI. The summarized position for the two quinquennia 1963-64 to 1967-68 and 1973-74 to 1977-78 is given in Table 38 below:

TABLE 38

Rail fractures on running lines.

Period										
	CR	**ER**	**NR**	**NER**	**NFR**	**SR**	**SCR**	**SER**	**WR**	**Total**
1963-64 to 1967-68	1432	738	609	60	38	288	137	141	986	4429
1973-74 to m1977-78	1673	638	1507	63	544	118	487	2261	1130	8421

279 From the It will be seen that during the 5-year period from 1973-74 to, 1977-78, the number of rail fractures on running lines of Indian Railways, had almost doubled compared to those during the period 1963-64 to 1967-68. Except on the Eastern, North-Eastern and Southern Railways, the number of rail fractures has increased on all the other Railways. The increase on the Northern, Northeast Frontier, South Central and South-Eastern Railways is indeed disquieting. Each rail fracture in the running lines is a potential hazard to the safety of trains. We would, therefore, urge the Railway Board and the Railway Administrations to take effective steps so that flaws in rails are detected in time and the defective rails are removed from track before these develop into fractures. We propose to comment on this aspect in our subsequent report.

280 According to the classification of accidents by the Railway Board, fracture of a rail as a failure of permanent way, is an accident falling under Class T. In the Accident Statistics published annually by the Railway Board, the incidence thereof is shown in the summary of accidents under Group-II as 'Broken Rails'. The number of broken rails on the Indian Railways since 1968-69 as extracted from the Accident Statistics is given in Table 10, Chapter II. We find that there is a wide disparity in the number of 'Broken Rails' as given in the Accident Statistic's published annually by the Railway Board and the number of rail fractures on running lines as advised to us by the Railways which is shown in Annexure XXI. It would appear as if all rail fractures occurring on running lines on the Indian Railways are not being reported as accidents. The Railway Board and the Railway Administrations should look into this discrepancy in reporting and compilation of Accident Statistics and take necessary corrective action.

281 **Mechanized Maintenance of track.—** (Recommendation 110 (i), (ii) and (iii)—Part II)—The Wanchoo Committee observed that the Indian Railways had only a limited number of on-track tie-tamping machines and indigenous capacity for their manufacture was unlikely to' be adequate in the years to come to meet the requirements of the Railways if they were to adopt mechanized maintenance of track extensively. They felt that the factor of foreign exchange component in the cost of on track tie-tamping machines should not deter the Indian Railways from working out a programme for switching over to modern methods of track maintenance on its trunk routes and main lines. The programme should take into consideration the

economics as well as the safety 'aspect of mechanized maintenance and of other modern means of maintenance of track so that an integrated plan is worked out and the actual effect of modernization is felt in the next few years.

282 The Railway Board have advised us that at present there are 50 tie tamping machines for broad gauge track on the Indian Railways. Orders have been placed for 8 broad gauge machines and tenders invited for supply of another 8. They have stated that as envisaged in the Corporate Plan, about 8 machines will be procured every year. The introduction of tie-tamping machines has to keep pace with the introduction of modern track structure, the natural wastage of labour and also availability of funds. They have added that the factor of foreign exchange component in the cost of tie-tamping machines is not deterring the Indian Railways from switching over to modern methods of track maintenance on its trunk routes and main lines. The Railway Board have also advised us that track maintenance programme takes into consideration the economics as well as the safety aspect and also various modern means of track maintenance, viz., directed track maintenance, measured shovel packing and mechanized maintenance. Mechanized maintenance is adopted on track with pre-stressed concrete sleepers and also where long continuous welded rails are laid on other types of sleepers. They have added that the actual effect of modernization has already been felt by way of improved running quality of track.

283 We note that the Committee of Directors, Chief Engineers and Additional Commissioners of Railway Safety on

"Review of Track Standards—(Broad Gauge)" had recommended in 1972 that mechanized maintenance of track on Group 'A', 'B' and 'C' routes should be planned by utilizing on-track tie-tamping machines on as much length of these routes as possible and on other routes manual track maintenance would continue. The Railway Board accepted this recommendation and proposed to introduce progressively mechanized maintenance of track on all important routes. We note that from 18 tie-tamping machines in ,1968, their number increased to 50 in 1978. Mechanized maintenance has been extended to cover 5000 kilometers of track on trunk routes and main lines of all except the North-Eastern and Northeast Frontier Railways. We commend the progress so far made in mechanization of track maintenance and hope that the same will be maintained.

284 According Traffic Blocks for Mechanized Maintenance of Track.— (Recommendation 149—Part 1, 110 (vi)—Part Wanchoo Committee noted that a concomitant of mechanized maintenance was the availability of traffic blocks on busy sections so that automotive tie-tamping machines mild be put to optimum use. They suggested that train timetables on such sections should be framed in a manner that a block of time of about tour hours can, without difficulty, be allotted for mechanized maintenance of track and for maintenance of other equipment. They cautioned that unless arrangements to this effect could be ensured, the Railways would be going in for heavy expenditure in acquiring the equipment in vain.

285 The Railway Board has stated that adequate traffic blocks for use of on-track tie-tamping machines are considered very necessary. However, it had not been possible to obtain four-hour blocks per day for the machines.

286 We find that the performance of tamping machines on the Railways is reported to the Railway Board every month. These reports, interalia, give the availability of traffic blocks for the working of tamping machines. The position in this regard for the last three years is given in Annexure XXII. It will be seen that during 1978, traffic blocks averaged 53 hours 38 minutes per machine worked per month against the target of 100 hours per month set by the Railway Board. On the Central, Eastern, South-Eastern and Western Railways there was deterioration in the availability of traffic blocks during 1978 as compared to the previous year.

287 In their comments, the Railways also generally pointed to the unsatisfactory availability of traffic blocks for mechanized maintenance specially on the high traffic density sections where on-track tamping machines have been deployed. The Central Railway has stated that it has been found difficult to allow traffic blocks on Bombay Division and that additional line capacity works would need to be planned in future. This Railway has considered mechanized maintenance of track on suburban sections essential since there was hardly any time available for manual maintenance of track due to intensive traffic. The Eastern. Railway has stated that due to non-availability of adequate traffic blocks for the working of machines, the required cycles of maintenance cannot be

adhered to, and arrears of maintenance have to be made up by deploying manual labour to maintain -the track to the required standard. On the Northern Railway it has not been possible to incorporate the traffic block hours in the timetable because of unavoidable fluctuations in the running of goods trains. The Western Railway has stated that traffic blocks of the required duration; viz. four hours on a single line and 2 split blocks of 2½ hours duration on the same or either line are not available on the Bombay-Vadodara electrified route and also on Kota Division due to heavy traffic. This Railway has taken up the provision of required traffic facilities to enable granting of the required traffic blocks.

288 We find that the position regarding traffic blocks leaves much to be desired and the Wanchoo Committee's recommendation has not been fully implemented. It has been admitted by the Railway Board as well as the Railway Administrations that, for various reasons, it has not been possible to give adequate traffic blocks required for working of on-track tie-tamping machines. It is inevitable that in the circumstances maintenance will suffer and the cumulative effect of this over a period of time will have a vital bearing on safety. The position will get further aggravated with increased use of concrete sleepers. The need for granting regular traffic blocks of sufficient duration on day-to-day basis cannot, therefore, be over emphasized. Ways and means to arrange this must be found.

289 Track Recording Car.— (Recommendation 151—Part I, 111(i)(iii) — Part 11)— The Wanchoo Committee suggested that the construction and equipment of the test cars

should be completed on priority and that at least one test car for the meter gauge should be made available as soon as possible. They stressed the importance of inspection of track by modern methods and felt that if the Government are unable to manufacture the test cars within a reasonable time, they should not hesitate to obtain them from elsewhere. The Wanchoo Committee also considered it necessary that improvements should be effected to enable the track recording car to record all track irregularities at higher speeds accurately.

290 In their remarks, the Railway Board stated that manufacture of track recording cars had been completed. Seven track recording cars and one oscillograph car on meter gauge are already in use for objective inspection of track. One electric track recording car, which records all track irregularities at higher speeds, has been manufactured and is in use. In addition, one track-recording-cum-research car which can record track geometry even up to speeds of 160 kmph is also in use. They have added that no necessity is being felt at present to obtain the test cars from abroad and that appropriate action would be taken when such a need was felt.

291 In reply to the questionnaire, the Railways have also advised the extent of monitoring of track done by track recording cars in the last few years. This information for broad and meter gauges is given in Annexures XXIII and XXIV. We are happy to note that, between 197071 to 1977-78, the length of track monitored by track recording cars on -broad gauge had increased nearly two-fold from 39577 to 74748 track kilometers and on the meter gauge from 2730 to 8000 track

kilometers. We hope that this progress will be maintained and increasing length of track would be brought within the scope of monitoring by track recording cars.

292 Hallade Track Recorders.— (Recommendation 150—Part I, 111 (iv), (v), (vi)—Part II)— The Wanchoo Committee held the view that Hallade Track Recorder was a useful instrument for testing the riding qualities of the track at high speeds and urged that steps should be taken to acquire track recorders in adequate numbers so that each division has one to itself. They suggested that the Divisional Officers and staff should be encouraged to use these instruments intensively and should also be trained in the evaluation of the results recorded by these instruments. They considered it necessary that the Assistant Engineer concerned should invariably be associated with the testing of the track by the Hallade Track Recorder and that the charts should be documented at the end of the day's run and defects listed for prompt action by sectional permanent way inspectors.

293 In their remarks, the Railway Board stated that Hallade Track. Recorder was of limited utility even for use at lower speeds since the reading recorded by it were affected by the characteristics not only of the track but also of the vehicle. They added that these limitations become far more pronounced at higher speeds and in view of the same, it was proposed to use track recording cars rather than Hallade Track Recorders. The riding quality of track on Group 'A' routes was being monitored by Track Recording and Oscillograph cars and Hallade Track Recorder, was being used on other routes only. The procurement of track

recording cars had been planned on the same basis. The Railway Board also stated that Hallade Track Recorders already available are being used and the officers and 'staff are properly trained in their use. They did not consider it necessary to provide an instrument in each division. The permanent way inspector and the assistant engineer of the section are invariably associated with the periodical inspections of track by Hallade Track Recorder/Track Recording Car and Oscillograph car. Besides the notes taken by the permanent way inspector and the assistant engineer regarding the track defects noticed during the inspection runs, the track condition charts produced during these runs are also sent to them promptly to enable them to attend to the track defects at the earliest.

294 The RDSO has also advised us that Hallade Track Recorders are not capable of providing accurate information about the condition of track. According to them the information is more 'quantitative' in nature and these records are influenced by the riding characteristics of the vehicle in which the recorders are carried. They added that with that modern concept of monitoring track defects, both quantitatively and qualitatively, these instruments would be outdated and their procurement, one for each division, would not he worthwhile. The RDSO has stated that presently, with a fleet of track recording cars and a track recording-cum-research car, monitoring of track is being done according to pre-determined schedules. They have suggested that in between monitoring runs by track recording cars, whenever certain checks are required to be carried out, it would be expedient to monitor the riding quality of track with ‘portable accelerometers’. These instruments are considered not only accurate, giving quantified vertical and lateral

accelerations, but are also quite cheap, easy to use and can be considered as superior to the Hallade Track Recorders. They have added that action is being taken to standardize the use of 'portable accelerometers' for such checks to be conducted by the Railways. Three 'portable accelerometers' which are presently available with the RDSO are being utilized for research purposes and also for assisting the Railways for urgent track monitoring work.

295 We agree with the views of the RDSO and the Railway Board that no useful purpose would be served by equipping each division of the Railways with a Hallade Track Recorder. Regarding the question of providing 'portable accelerometers' for monitoring the riding quality of track, we shall go into this 'matter further and advert to it in the subsequent report.

296 Stores workload of Permanent Way Inspectors—and Signal Inspectors.— (Recommendation 113(i), (ii)—Part 1I)— During their tours of the Railways, the Wanchoo Committee found that the custody and accountal of stores not only claimed a lot of time. of permanent way inspectors but were a source of considerable anxiety to them and prevented them from giving their undivided attention, energy, and time to the maintenance of track—their principal job. They stated that the Chief Engineers of all the Zonal Railways were of the unanimous view that their was definite need for relieving permanent way inspectors of the stores workload. The same difficulty was found in regard to the stores charge of signal inspectors. The Wanchoo Committee recommended that in all cases, permanent way inspectors and

signal inspectors should be relieved of their stores charge and should be held responsible only for the imprest issued to and required by them for their day-to-day work. They also suggested that where a permanent way inspector and a signal inspector are both head-quartered at the same station, the person entrusted with the maintenance of the permanent way stores could be concurrently responsible for signalling stores. At other places, separate arrangements may be made.

297 In their remarks, the Railway Board stated that in order to reduce the workload and responsibility devolving on permanent way inspectors in the matter of custody of stores, a permanent way stores depot has been set up generally on each division of the Indian Railways and simplified procedure of accountal of stores, disposal of scrap and. surplus material has been laid down. They added that the matter of relieving permanent way inspectors and signals inspectors of their stores charge has been considered in the light of the Third Pay Commission's recommendations and it leas been decided that the custody of stores is an inseparable part of the duties of Inspectors and that they cannot be divested of this responsibility. Where, however, the organizational assistance was inadequate, the same could' be strengthened by providing extra clerical assistance. The allotment of the higher grade of Rs. 130-3 00 (AS) (Rs. 330-5 60 Revised) to heavier charges was to be accommodated within the overall number of such posts 'available in the clerical cadre.

298 We note that the above decision by the Railway Board was takes consequent to the following observation made by the Third Pay

Commission in their Report (Volume I, Chapter XIV, Para 48, page 148):

> *"The Permanent Way Inspectors have a grievance that despite repeated recommendations of various Railway Accidents Enquiry Committees, they have not been relieved of responsibility for the custody and accounting of stores materials. The departmental witnesses have informed us that various proposals are under consideration for relieving engineering inspectors of their stores charge to the extent practicable. It should, however, be recognized that custody of stores is as inseparable part of the duties of inspectors and that there is no justification for granting a special pay as compensation for such work."*

Thus, the view regarding the custody of stores 'forming an inseparable part of the duties of inspectors was taken by the Third Pay Commission, in the context of the demand of the permanent way inspectors for grant of special pay as compensation for such work. The Third Pay Commission had not gone into the question of desirability or otherwise of relieving the inspectors of the stores workload.

299 In view of the above, the stand now taken by the Railway Board that the custody of stores is an inseparable part of the duties of inspectors and that they cannot be divested of this responsibility, is a reversal of their stand on the recommendations made by the Kunzru Committee in 1962. Considering that this matter had engaged the attention of three high level Railway Accident

Enquiry Committees i.e. the Shahnawaz Committee-1954, Kunzru Committee-1962 and the Wanchoo Committee-1968, we feel that such an important issue should not have been decided only on the basis of the views of the Pay Commission.

300 We also note that for rationalizing the workload of signal inspectors, the Efficiency Bureau of the Railway Board conducted a study in 1977. For reducing the stores workload of signal inspectors, they recommended that a signal stores depot should be set up on each division on the lines of the permanent way depot and only imprest stores required by the Sign1 Inspectors in their day-to-day work should be stocked by them. This recommendation has not been implemented since the Railway Board ix March 1978, directed the Railways to pend the setting up of signal stores depots in each division till further orders.

301 Regarding the suggestion made by the Wanchoo Committee for entrusting the signalling stores to the same person responsible for permanent way stores, the Railway Board stated that this recommendation Lad been circulated to all the Railways for guidance. In their comments most of the Railways have stated that combining a signal and perms-vent way stores is not feasible.

302 From the foregoing, we find that the Wanchoo Committee's: recommendations remain unimplemented. We propose to go further into this matter and shall advertise it in the subsequent report.

Level Crossings

303 As indicated in Chapter II, during the 10-year period from 1968-69 to 1977-78 after the appointment of the Wanchoo Committee, 116 accidents occurred every year, on the average, between road vehicles and trains at level crossings When compared to the 5-years period ending 1967-68 there was a decrease in the annual incidence of accidents at level crossing by 10 per cent, even though the density of both rail and road traffic had meanwhile gone up. However, level crossing accidents invariably take a heavy toll of casualties every year. During the said 10-year period, out of an average 205 persons killed every year in all accidents on the Indian Railways, 93 persons (45.2 per cent) were killed in accidents at level crossings; 30 per cent of the total injuries also occurred in these accidents. The casualties in level crossing accidents mainly involved outsiders and, therefore, such accidents pose a danger primarily to the road-user. However, with higher speeds of trains and increase in the traffic density on most sections of the Railways and on roads, level crossings also pose considerable threat to the safety and efficiency of train operations. It is in this context that provision of improved safety measures for rail and road traffic at level crossings assumes importance.

304 At the end of 1977-78 there were 40,591 level crossings on the Indian Railways. Level crossings are classified on the basis of density of rail and road traffic and also their importance which is determined in consultation with the State Governments/Local authorities. The number of level crossings in each class as on. 31-3-1978 was as under: —

Special Class	251
'A' Class	1204
'B' Class	3795
'C' Class	8703
" " Unmanned	22329
'D' Class (Cattle crossings)	4309
Total	**40591**

Out of 40,591 level crossings, 13,953 (34.4 per cent) were manned and 22,329 unmanned, excluding 4,309 cattle crossings. Almost one-third of the level crossing accidents occurred at manned and the remaining two-third at unmanned level crossings. Thus, safety measures have envelop both manned and unmanned level crossings.

305 The Wanchoo Committee made 31 recommendations and observations on level crossings. Recommendations 154, 159 & 163 of Part I and 114, 119 & 120 of Part II have been either implemented or appropriate instructions have been issued, as required in the circumstances. Recommendations 125 (i) and (ii) of Part II were not accepted by the Railway Board. These recommendations together with the views or action taken as advised to us by the Railway Board are given in the Appendix to this report. Our detailed review of the remaining recommendations on level crossings is given in the following paragraphs.

306 Norms for manning an unmanned level crossings and upgrading a manned level crossings: (Recommendation 153—Part I, 115 (i), (ii), (iii)—Part II)—The Wanchoo Committee, in. Part I of their report, expressed the view that some norm should be fixed for all the

Railways which may help them .in deciding whether a particular unmanned level crossing should be manned and whether a manned level crossing required upgrading. The Railway Board had informed them that they were not in favour of prescribing any norms since local conditions would greatly weigh in each case. The Wanchoo Committee, however, held the view that the existence of norms would firstly, provide broad guidelines for the Railways to work upon and secondly, would ensure uniformity of procedure at level crossings on the same or contiguous sections having more or less the same quantum of road and rail traffic. They recommended in Part II of their Report that norms for the manning of unmanned level crossings should be laid down; however, the yardstick or standard need not be rigid and should provide for deviations on the merits of each case after taking into consideration the need for safety.

307 In their remarks, the Railway Board had stated that since the initial cost of manning an unmanned level crossing was borne by the State Government/Road authorities, the norms for manning these had to be laid down with their concurrence. However, we find that no action in this regard was taken till December 1976, when the. Railway Board sought the views of the Railways regarding norms for manning of tip-manned level crossings. We understand that laying down of norms for manning of unmanned level crossings is presently in an advanced stage of consideration by the Railway Board.

308 In redly to the questionnaire of the Committee, the Zonal Railways have advised us of the criteria which are being followed for manning of unmanned level crossings and also upgrading of

manned level crossings. Manning is considered on the basis of combined density at rail and road traffic at the level crossing, reckoned in terms of train vehicle units* (TVU). The yardstick in this regard vary from 1000 to 5000 TVIs on 'different railways. For the upgradation of manned level crossings also, largely, divergent norms are in vogue.

*Train Vehicle Units are at by multiplying the number of trains by the number of vehicle units after giving the following weightage. Motor vehicle = 1, Bullock Cart=1, Horse-driven Cart=1, Cycle Rickshaw=1/w. No weightage is given for cattle, cycles, and pedestrians.

309 We note that as recently as March 1979, the Railway Board 'have directed the Railways is undertake at their own cost entirely, manning of unmanned level crossings which are potential hazards to the :safety of rail, and road mars and are thus considered accident prone. For this purpose, an manned level crossing with rail-road traffic density exceeding 5000 TVUs per day or where the view is severely restricted due to cutting or curvature is to be considered as 'accident prone'.

310 This recommendation of the Wanchoo Committee has, therefore, not been implemented. The need for laying down appropriate norms for manning of unmanned level crossings and upgrading of manned level crossings cannot be over-emphasized. Considerable delay in this regard has already taken place and we do hope that norms would be laid down .as recommended by the Wanchoo Committee, without further delay.

311 **Manning, of Level Crossings by one Gateman:—** (Recommendation 116(i), (ii)—Part 11)— The Wanchoo Committee expressed concern over those 'C' Class level crossings which were manned by one gateman on 24 hours duty. They suggested that on such level crossings an appraisal of the traffic using the gate should be made speedily and depending on the result, the Railway Administrations should decide whether a case exists for having two men at such gates or whether the gate Should be unmanned. They stated that in no case should a gate remain with only -one man on duty all the 24 hours.

312 We note that the Railway Labour Tribunal 1969, which was appointed under the Permanent Negotiating Machinery, recommended that gatemen at 'C' Class level crossings (along with some other categories of railway staff) should be removed from **'Excluded'*** classification and should be classified as **'Essentially Intermittent'*** workers. The Railway Board accepted this recommendation with effect from 1st August 1974 and the following guidelines were given to the Railways for implementing the same.

> *"'(i) at such of the gates where road traffic in the night is very light, the gateman should be given 12 hours shift during daylight hours from 6 a.m. to 6 p.m. or 7 p.m. as considered appropriate in the local conditions. The level crossings would thus remain unmanned during the night and the gates would be kept locked to road traffic.*

(ii) where gates are located within the station limits, arrangements should he made to make the gateman deposit the keys of the gate with the Station Master who in turn can arrange to get the gates operated by detailing station. staff whenever there are, occasional demands from the road. users for opening the gate in the night.

(iii) where gates are situated outside the station limits and where the incidence of road traffic is not enough to justify an additional gateman for the night, split shift rosters should be introduce& for gatemen to open the gates during specified night hours.

(iv)on such of the level crossings where the traffic during day and) night is light and where visibility conditions both for the road and rail traffic are good, the level crossings could be de-manned.

(v)in all other cases of single manned level crossings, the additional gateman should be provided, each gateman performing 12: hours shift duty."

*Classification of Railway servants in accordance with the Hours of Employment Regulations.

313 The Railway Board have advised us that for round the clock, manning of level crossings a minimum of two gatemen has now been,

provided. The Zonal Railways have also confirmed that the guidelines. given by the Railway Board have been implemented.

314 According In reply to the questionnaire of the Committee, the Railways have, informed that there are 371 level crossings which are situated outside station limits and where the incidence of road traffic is not enough to justify-an additional gateman for the night and where split shift rosters have been introduced for gateman to open the gates during specified night hours. They have also advised that there are 820 level crossing gates which remain. unmanned during the night and are kept locked to road traffic. The keys. of such level crossing gates which are located within station limits or which are very close to the station are retained by the Station Master on duty and the gates are opened by the station staff on request made by the road users The Southern Railway has stated that although the above arrangement is-safe, it is not desirable to continue the same as the road-users would have to spend considerable time walking to and from the station at the risk of keeping their vehicle unguarded near the gate. The South Central has stated that occasional complaints about delay in opening the gates by the-station staff have been received. On some of the Railways where the gateman lives in the gate lodge, the gate is opened by him at night on request. by the road-users even though he may not be on duty.

315 From the foregoing, we find that the recommendation of the Wanchoo, Committee has been substantially implemented'.

However, we are not happy with certain aspects of the present arrangements. We propose to go into this matter further and shalt advert to it in the subsequent report.

316 **Railway Safety Works Fund:—** (Recommendation 155, 156 & 157—Part I and 117—Part II)— The .Wanchoo Committee noted that there had been hardly any expenditure out of the Railway Safety Works Fund primarily because of the cumbersome procedure for operating this fund. They suggested that some procedure should be evolved by which 10 per cent of the amount in the Railway Safety Works Fund should be earmarked for manning unmanned level crossings and upgrading manned level crossings. For this purpose, the Railway Administrations should be authorized' to draw directly from this fund up to the above limit. They also suggested that the remaining 90 per cent of the fund should be utilized to the best advantage by providing road over-bridges or under-bridges, which would undoubtedly help in reducing the number of level crossing accidents.

317 In their remarks, the Railway Board have advised us that the procedure of withdrawals from the Railway Safety Works Fund has been streamlined in consultation with the Ministry of Finance. In March 1971, instructions were issued to the State Governments indicating the procedure to be followed for getting reimbursement from the Railway Safety Works Fund. The Railway Board, in consultation with the Ministry of Finance, had also accepted the recommendation that 10 per cent of the contribution to Railway Safety Works Fund may be earmarked for manning of unmanned level crossings and

upgrading manned level crossings. Accordingly, with effect from 1st April 1974, reimbursements) to State Governments towards the cost of replacement of level crossings by road over-bridges and road under-bridges are made only to the extent of 90 per cent of the amount available as their share in the Railway Safety Works Fund. The balance 10 per cent is to be utilized by the Railways directly on works of manning of unmanned level crossings and upgrading of the existing manned level crossings. Further, as from 1st April 1978, the aforesaid 10 per cent has been raised to 20 per cent with a view to quicken the pace of manning of unmanned level crossings and upgrading manned level crossings. Thus, the Wanchoo Committee's recommendation in this respect has been fully implemented.

318 From the information furnished.by the Railway Board we find that till March 1979, Rs. 2564.52 lakhs had been credited to the Railway Safety Works Fund. Out of this, Rs. 2,412.47 lakhs were earmarked for distribution to the State Governments (hereinafter referred to as 90 per cent Railway Safety Works Fund) towards reimbursement of expenditure incurred on construction of roads over-bridges and under-bridges. The balance sum of Rs. 152.05 lakhs were available for direct expenditure by Railways (hereinafter referred to as 10 per cent Railway Safety Works Fund) on works of manning of unmanned level crossings and upgrading of manned level crossings.116

319 The State-wise position of utilization of the 90 per cent and 10 per cent Railway Safety Works Fund is given in Tables 39 and 40 below:-

TABLE 39
State-wise utilization of 90 percent Railway Safety Works Fund

State	Amount credited to 90 percent Railway Safety Works Fund since 1-4-1966	Amount utilized (up to March 1979)	Balance amount t remaining unutilized	Percentage utilization 5 $= \frac{(3)}{(2)} X\ 100$
(1)	(2)	(3)	(4)	(5)
	(Rupees in lakhs)			
Andhra Pradesh	201.04	108.66	92.38*	54
Assam	67.72	24.50	43.22	31.7
Bihar	259.14	78.12	181.02	30.1
Gujarat	172.18	79.82	92.36	46.4
Haryana	60.50	24.72	35.78	40.8
Himachal Pradesh	1.94	Nil	1.94	Nil
Jammu & Kashmir	0.36	Nil	0.36	Nil
Karnataka	8.84	68.48	20.36	77
Kerala	41.27	15.13	26.14	36.7
Madhya Pradesh	238.94	42.58	196.36	17.8
Maharashtra	217.52	132.63	84.89	61
Nagaland	0.26	Nil	0.26	Nil
Orrisa	53.76	Nil	55.76*	Nil
Punjab	117.74	82.55	35.19	70
Rajasthan	156.66	146.05	10.61	93.2
Tamil Nadu	129.59	111.58	18.01	86.1
Tripura	0.22	Nil	0.22	Nil
Uttar Pradesh	467.71	113.14	354.57	24.2
West Bengal	135.08	Nil	135.08	Nil
Total	**2412.47**	**1027.96**	**1384.51**	**42.6**

*Reimbursement of the balance amount is under process.

**Reimbursement of Rs. 43 lakhs is under process

320 The It will be seen that the overall utilization of the 90 percent and 10 percent Railway Safety Works Fund up to March 1979 had been only 42.6 and 55.7 percent respectively. 90 percent Railway Safety Works Fund of the ‘share of West

Bengal remains unutilized since 1966. In Uttar Pradesh, Madhya Pradesh and Bihar also, despite a substantial network of the railway system, the utilization of this fund has been poor.

321 The provision of road over-bridges and under-bridges and manning or upgrading of level crossings will undoubtedly improve the safety of rail and road traffic at level crossings. As such non-utilization of the aforesaid portions of the fund defeats the very purpose for which this has been set up. In our opinion there appears to be a need for more persistent efforts on the part of the State Governments and the Railways to utilize the 90 per cent Railway Safety Works Fund in the shortest possible time. Utilization of the 10 per cent Railway Safety Works Fund depends primarily on the Railways themselves. The Railway Board should ensure that each Railway plans for a sufficient number of works of manning of unmanned level crossings and upgrading of manned level crossings in their annual works programme for full utilization of the 10 per cent Railway Safety Works Fund.

322 The Provision of communication between level crossings and adjoining stations. —

(Recommendation 118—Part II)— The Wanchoo Committee Recommended that it was necessary to provide some kind of reliable communication between the gateman at a mid-section level crossing and the adjoining station to save the road traffic from long and irritating detention to the extent possible and at the same time to ensure safety.

323 The Railway Board have advised us that the facility of telephone communication has already been provided at all Special Class and most of the 'A' Class level crossings and that this work is in progress at the remaining 'A' and 'B' Class level crossings.

324 In response to the questionnaire of the Committee, Railways have furnished us information regarding the number of level crossings not provided with telephone communication. This information is given in Annexure XXV and the position is summarized in Table 41 below. —

TABLE 41

Type of level Crossing	Total number of level crossings	Level Crossings not provided with telephone communication	
		Number	Percentage $\frac{(3)}{(2)} X\ 100$
2	2	3	4
Special Class	241	24	10.0
'A' Class	1156	114	909
'B' Class	3523	1153	32.7
'C' Class	7410	3488	47.1

325 It will, be seen that 24 Special Class level crossings on the Eastern, North-Eastern, Southern and Western Railways are still to be provided with telephone communication. Thus, contrary to the claim of the Railway Board, some Special Class level crossings still remain to be provided with telephone communication. Besides, the number of 'A' and 13'

Class level, crossings without telephone communication continues to be significant.

There appears to be some discrepancy in the figures of level crossings as given by the Railway Board and those furnished to us by the Zonal Railways. However, these discrepancies do not make any significant difference to the overall picture concerning the non-provision of telephone communication at level crossings.

326 The Wanchoo Committee had recommended provision of telephone communication at all mid-section .manned level crossings which would cover 'C' Class manned level crossings also. We note that the Railway Board tad issued instructions for provision of telephone facilities at all special, 'A' & 'B' Class level crossings and only such of the 'C' Class manned level crossings on Rajdhani Routes as are in the block section and are normally kept open to road traffic. Besides 'A' and 'B' Class level crossings a large number of 'C' Class level crossings which fall in mid-section on other routes, would also need to be provided with this facility. Thus, this recommendation still remains to be fully implemented. We would urge the Railway Board to complete this long outstanding work at all the mid-section manned level crossings with priority on a time-bound basis.

327 In Lifting 'barriers at important 'level crossings.—(Recommendation 121—Part II)—The Wanchoo Committee were of the view that all important level crossings should be provided with sympathetic barriers of the lifting type equipped with eccentric wheels which actuate bells and flashing lights

indicating to the road-users when the barriers were being lowered or .raised.

328 In In their remarks, the Railway Board have stated that gates are being replaced by lifting barriers equipped with warning bells progressively at all important level crossings. Flashing lights are also being provided on level crossings with multiple lines, where the traffic was heavy and where electric power is available.

329 In reply to the questionnaire of the Committee, the Railways have advised us of the number of level crossings which have been provided with lifting barriers. This is given in Annexure XXVI. Table 42 below gives the (summarized position: —

TABLE 42

Provision of lifting barriers at level crossings

Type of level crossing (Manned)	Total number of level crossings	Level crossings provided with lifting barriers	
		Number	Percentage $(4)\frac{(3)}{(2)} X\ 100$
(1)	(2)	(3)	(4)
Special Class	241	186	77.2
'A' Class	1156	680	58.8
'B' Class	3523	1289	36.6
'C Class'	7410	1043	14.1

330 In It is apparent from the Annexure that on the Southern and Western Railways, a large number of Special Class level crossings still remain to be provided with lifting barriers. In the case of 'A' Class level crossings also, the Southern and South-Central Railways are lagging behind the others is the matter of providing lifting barriers.

331 The implementation of this recommendation has necessarily to be phased. We would urge the Railway Administrations to take up the provision of lifting barriers on a time bound basis, giving priority to important. level crossings.

332 Automatic Half Barriers at Level Crossings.—

(Recommendation, 162—Part I, 122 (i), (ii), (iii), 123 and 124(i), (ii) and (iii)—Part III The Kunzru Committee suggested (Recommendation (No. 7(iii) (c)— Part II) that determined and energetic steps should be taken to evolve an efficient and 'fail-safe' automatic barrier to suit Indian conditions. The Railway Board accepted this recommendation, and in June 1964 directed the Northern, Southern, Central and Eastern Railways to undertake trials with automatic half-barriers at one level crossing (manned) on each railway. However, during discussions, the Wanchoo Committee were informed by the Railway Board that they did not consider the automatic half-barriers suitable for Indian conditions and the experiment may be taken as no longer alive. They also issued

instructions to the aforesaid Railways in December 1968 that trials with automatic half-barriers may not be carried out.

The Wanchoo Committee went into this question in detail and made the following suggestions-

(i) it would be worthwhile experimenting with automatic half-barriers to see if these can successfully take the place of manned level crossings with due, measure of safety.

(ii) experiments with automatic half-barriers may be done with advantage and without undue risk at least nearabout the cities where automatic light signals are in use at road crossings and the road users have got used to them.

(iii) While installing automatic half-barriers conditions should be created by which breaking the queues and zigzagging by road-users was rendered difficult if not impossible. This may be achieved by fixing small raised and provided blocks with height. of six to twelve inches in the center on both approaches of the level crossing for an adequate distance; and

(iv) provision may be made for the prosecution of those road drivers who disregard the automatic half-barriers in the same way as a road driver is liable to prosecution if he ignored traffic lights.

They also suggested that if the experiment with automatic half-barriers was to be successful, special care would have to be taken to guard against vandalism and theft of ground equipment and it would have to be ensured that the installations are in perfect order, so that safety is not endangered.

333 In their remarks the Railway Board stated that the provision of half-barriers at level crossings was still in the trial stage and that no decision had till then been taken to adopt such gates as standard on the Railways. They added that the question of legislation for prosecution of road drivers for disregard of automatic half-barriers would be pursued with the State Governments after successful completion of trials and final decision was taken to adopt automatic half-barrier gates as a standard on the Railways.

334 The first trial automatic half-barrier, using equipment imported from France, was commissioned at Unnao on Northern Railway on 6-9-1972. In their report on this trial, the RDSO stated that the automatic hall-harriers had been working satisfactorily, road-users have been following the traffic rules and that no case of violation into the wrong lane of the road at the time when the automatic half-barriers were in the process of being lowered before arrival of a train, had been noticed. They added that the road-users and the State Government officials had been extremely happy with the performance of this installation and had requested for its permanent retention at this level crossing. The RDSO suggested that more of such trial installations should be planned specially in metropolitan cities at locations where road-users were conversant with traffic rules and have a high road sense. They cautioned that such barriers should not be planned for roads used by slow or animal driven vehicles and that their use _should be limited to protecting not more than two railway tracks.

335 In consideration of the recommendations made by the RDSO, the Railway Board issued instructions in June 1973 to the Central, Eastern, Southern and Western Railways to select one or two suitable level crossing gates near the metropolitan cities for trial installation of automatic half-barriers.

336 From the comments of the Railways we find that no progress in the trials has so 'far been made on any of the Railways. Even the sites where the trial installations of automatic half-barriers are to be put up have not been finalised. We, however, note that the Zonal Railways had indicated their difficulties in this connection to the Railway Board. The Central Railway had advised the Railway Board that the Police Authorities did not agree to trials with automatic half-barriers being carried out anywhere in Bombay Metropolitan area. The Eastern Railway held the view that with the type of traffic passing over the level crossings in and around the metropolitan city of. Calcutta, it may not be possible to install and try automatic half-barriers in that area. They were, therefore, reluctant to conduct trials with automatic half-barriers. The South-Central Railway who had also been asked to conduct trials with automatic half-barriers also indicated their reluctance on the plea that locations which would fulfil the conditions for the trials as laid down by the RDSO were not obtainable on that Railway.

337 From the foregoing, it would be seen that there has been considerable difference of opinion and reluctance on the part of the Railways to undertake trials with automatic half-barriers at level crossings. The Police Authorities have also not favoured

such trials in metropolitan areas. In view of this and the difficulties expressed by the Railways, we would examine this matter further and advert to it in the subsequent report.

338 In Provision of undulations and bumps on approaches to unmanned level crossings.—

(Recommendation 158—Part I)— The Kunzru Committee had recommended [Recommendation 57(ii) in Part I] that approaches to unmanned level crossings should be provided with undulations or bumps 'so that fast moving road vehicles were obliged to reduce their speed while passing over them. The Wanchoo Committee, however, considered that such undulations or bumps would not have any advantage and suggested that this matter need not be pursued further.

339 In the light of the recommendations of the Wanchoo Committee, the Railway Board had advised the Railways in 1969 not to pursue this matter with the State Governments. With the growing trend of accidents at level crossings, a majority of which were caused due to the negligence of the drivers of road vehicles, the Railway Board in August 1975 requested the Ministry of Shipping and Transport for implementation of additional safety measures at level crossings which included provision of speed breakers. Initially the Ministry of Shipping and Transport had given instructions to the State Governments in this regard, but in October 1976, on the advice of their Roads Wing, they advised the State Governments to discontinue the provision of speed breakers.

340 We note that the Railway Board in May 1977 again drew the attention of the Ministry of Shipping and Transport to the continuing trend 'of accidents at unmanned level crossings (collisions between trains and road vehicles) with attendant loss of life and property and requested them to issue suitable instructions to all State Governments/Union Territory Administrations to provide speed breakers (bumps) on approaches to all unmanned level crossings on top priority. Thereupon the Ministry of Shipping and Transport instructed the State Governments in January 1978 that, as a special case, speed breakers (bumps) may be provided on approaches to unmanned level crossings, provided no other suitable measures are possible for the prevention of accidents at such locations. The extent of implementation of these instructions is being ascertained by the Railway Board. We note that the reaction of the State Governments to providing speed breakers at level crossings has not been entirely favourable. While the States of Assam, Maharashtra, West Bengal, and Karnataka had agreed in principle to provide speed breakers at unmanned level crossings, the States of Rajasthan, Punjab, Haryana, Uttar Pradesh, Tamil Nadu, Andhra Pradesh and Bihar had generally not favored their provision. In fact, speed breakers provided at a few level crossings in some of these States were dismantled by the State Governments because they were considered a cause for inconvenience and discomfort to the road-users.

341 In view of the divergent views of the State Governments regarding the provision of speed breakers and the need for controlling the speed of road vehicles at unmanned level crossings, we would examine this matter further and advert to in our subsequent report.

342 **Interlocking of level crossing gates with signals.-** (Recommendations 160 and 16l---Part I —The Wanchoo Committee considered that the basic object of interlocking of gates with signals was to ensure safety of road traffic and interlocking of gates with signals should be provided where the road traffic was heavy. They did not agree with the view that the measure of safety provided by the installation of warning bells was as good as that by interlocking gates with signals.

343 In their remarks, the Railway Board stated that with the exception of level crossings on mill sidings and goods yards, interlocking of gates with signals had been provided at all Special Class level crossings both within and outside station limits; 'A' Class level crossings within station limits; and `B' Class level crossings where the track was on a curve and the view was obstructed. They stated that interlocking of gates with signals was also being provided on 'A' Class level crossings outside station limits and `13' Class level crossings in suburban sections on a programmed basis, wherever justified. Consequent to the recommendation made by the Wanchoo Committee, the Railway Board had also given instructions that interlocking of 'A' Class level crossing gates outside the station limits should be taken up wherever justified by conditions of rail and road traffic. The Railway Board have advised us that the work of interlocking at busy 'A' and `13' Class level crossings beyond station limits has been taken up progressively.

344 From the information furnished by the Railways in reply to the questionnaire of the Committee, we find that since 1968-69, 637 level crossings have been interlocked with signals on all the Railways. The implementation of this recommendation, covering increasing number of level crossings, is necessarily a continuous process. However, from the comments of the Railways, we find that some level crossings on the suburban sections of the Eastern and South-Eastern Railways still remain to be interlocked. On the Western Railway, 23 'B' Class level crossings, where the track is Oft a curve, also remain to be interlocked with signals. We would urge these Railway Administrations to complete the work of interlocking of gates with signals at the above-noted level crossings on priority.

Signalling And Interlocking

345 Signals are provided to control the movement of trains. Interlocking is a technique achieved through mechanical and electrical means by which it is ensured that before a signal is taken off, the route which the signal controls is properly set and remains so, to safeguard against all conflicting movements. Signal and interlocking installations on the Railways thus ensure the safe operation of trains. Starting with rudimentary interlocking, signalling has developed over the years to suit varying permissible speeds of trains and increasing density of traffic. Developments in this field have been 'providing improved aids to drivers and station staff and thus reducing their dependence on the human element. Track circuiting and other detection facilities are also being extensively provided as aid

to station masters and cabinmen for verifying the occupation of lines under their control.

346 The Kunzru and Wanchoo Committees emphasized the need for increasing the use of modern signalling and interlocking techniques and125 devices on the Railways for improving safety. The Wanchoo Committee made 60 recommendations on varying aspects related to signalling and interlocking. Out of these, items 126 and 156 of Part II are mere observations and did not call for any action; items 164, 166 and 168 of Part I and 127, 128, 129, 131, 137 to 143, 147, 151, 152, 155, 157 and 158 have been implemented or the Railway Board have issued appropriate instructions in each case. The above-mentioned recommendations and observations together with the views/action taken thereon, as advised to us by the Railway Board, are contained in the Appendix to this report. Our detailed review of the implementation of the remaining recommendations on the subject of signalling and interlocking is contained in the following paragraphs.

347 **In Provision of Colour Light Signalling.—** (Recommendation 130 — Part II) view of the better visibility of colour light signals as compared to conventional oil lit signal lamps, the Wanchoo Committee recommended that on sections where electric power was available, colour light signalling should be provided as rapidly as possible.

348 In their remarks, the Railway Board have stated that colour light signalling was being provided as a part of all electrification projects. Besides, colour light signalling was also being

provided as and when replacement of existing signalling becomes due at other stations on the trunk routes and main lines where electric power was available.

349 The figures furnished by the Railways showing the progress of provision of colour light signalling during the last ten years are given in Annexure XXVII. The position is summarised in Table 43 below.

TABLE 43
Progress of provision of colour light signalling

Position as on	Number of Stations with Colour Light Signals		
	Broad Gauge	Meter Gauge	Total
1-4-69	250	81	331
1-4-78	858	149	1007

350 It will be seen that even though the Railway Board had accepted this recommendation with certain modifications, progress in the provision of colour light signalling has been made on the Railways since 1968. The Railways have generally confirmed that colour light signalling has been provided on electrified sections. The Eastern Railway have stated that on a number of electrified sections and in station yards, it has not yet been possible to provide uniformity in the type of signalling due to paucity of funds, and a combination of multiple aspect colour light signalling and 2-aspect semaphore signalling is still in existence. Some of these sections are stated to have been programmed for provision of colour light signalling during 1979-80.

351 In The implementation of this recommendation is a continuous process and we hope that the progress made so far will be maintained and even, improved.

352 **Electric lighting of semaphore signals.—** (Recommendation 132 — Part II)—The Wanchoo Committee urged the Railways to explore the possibility of switching over to electric lighting of semaphore signals wherever it was feasible and that economic considerations should not be allowed to stand in the w ay where the question of improved lighting and visibility of signals was concerned.

353 In The Railway Board accepted this recommendation and directed the Railways in May 1970 to introduce electric lighting of semaphore signals on a programmed basis at stations where reliable power supply was available.

354 In From the comments of the Railways we find that so far electric lighting of semaphore signals has been provided only at 42-stations on the Eastern, Southern and South-Eastern Railways. On the Central and Western Railways, only trials have so far been carried out. The Northern Railway has stated that prototype design for the electric lighting of semaphore signals has been manufactured and that equipment specifications are await ed from the RDSO. There has been no progress in this regard on the North-Eastern and South-Central Railways. The Northeast Frontier Railway has stated that they are switching over to colour light signalling on busy trunk routes. They have not considered it feasible to provide electric lighting of

semaphore signals because of thefts and uncertain power supply.

355 In The Railway Board have now advised us that the basic problem in regard to provision of electric lighting of semaphore signals is the non-availability of reliable and uninterrupted power supply. They added that this resulted not only in additional cost in providing standby equipment but also considerable increase in the maintenance workload. They have also stated that in view of the progressive provision of multiple aspect colour light signalling and due to extremely unreliable power supply in most of the areas, provision of electric lighting of semaphore signals has been possible at very few stations.

356 In We note that at the conference of Chief Signal and Telecommunication Engineers held in July 1978, complaints of non-lighting of distant signals at night on sections provided with Multiple Aspect Upper Quadrant (MAUQ) and Modified Lower Quadrant (MLQ) signalling were discussed. They felt that this was creating considerable tension in the minds of drivers. It was decided that electric lighting of semaphore distant signals should be: provided in order to overcome the problem of non-lighting of these signals so that drivers could run their trains with confidence. The Railways have been given directions to complete electric lighting of distant signals at stations provided with MAUQJMLQ signalling by 30th September 1979.

357 In From the foregoing we find that though the Railway Board had accepted this recommendation and trails on some railways had shown satisfactory results and proven the effectiveness of

this measure for improved lighting and visibility of signals, the progress made in the last eight years has been unduly slow. The Railway Board should take steps so that the' work of electric lighting of semaphore signals is completed on a time-bound basis.

358 Provision of Multiple Aspect Signalling.— (Recommendation 167 — Part I, 133, 134—Part II)—The Wanchoo Committee observed that only 41 per cent of the number of stations programmed to be provided with multiple-aspect signalling of the Upper Quadrant or colour light type on 31-3-1964, had been so provided. They suggested that in view of the recognized and established advantages or this type of signalling over the conventional two-aspect lower quadrant signalling, a more progressive policy of providing multiple-aspect signalling, at stations not only on trunk routes but also on main line routes should be followed. They considered that as an interim measure, the separation of the warner signal from the outer signal on some sections and placing it at a distance outside the outer Signal was a step in the right direction but at the same time stressed that the ultimate objective should be to go in for multiple aspect signalling on such sections also.

359 In In their remarks, the Railway Board have informed us that most of the stations on the trunk routes, except for a few small patches, have been provided with multiple-aspect signalling. This type of signalling was being progressively provided on trunk routes and important main lines as and when the existing signalling became due replacement on age-cum-condition basis. They stated that on other sections, the provision of multiple-aspect

signalling was not progressing well due to the fact that such projects have to be financed under 'Development Fund' and the very limited funds-available thereunder are always diverted to other requirements. They added that this type of work could not be financed under Accident Compensation and Public Amenities Fund (ACPAF). A proposal to expand the scope of ACPAF to include all safety works is stated to be under consideration. The Railway Board have also stated that the outer/warner combination signals are being progressively eliminated with the provision of multiple-aspect signalling, particularly on the trunk routes.

360 In The Railway Board and the Railways have furnished us information regarding the progress of provision of multiple aspect signalling on the trunk routes, main and branch lines. This information is given in Annexure XXVIII to XXX.

The summarized position is shown in Table 44 below-

TABLE 44

Progress of provision of multiple-aspect signalling

Year	Number of stations provided with multiple aspect signalling							
	Trunk Route		Main Line		Branch Line		Total	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.
1968-69*	538	311	112	187	133	83	783	581
							1364	
1977-78**(Upto Sept. 1978)	943	357	237	340	322	70	1502	767
							2269	

Note: *Information taken from replies of Railways.

****Information furnished by the Railway Board**

361 During the 10-year period ending 1977-78, 905 stations on the broad and meter gauges were provided with multiple-aspect signalling. It will be seen from Annexure XXVIII that on the trunk routes, out of 1177 and 444 stations on the broad and meter gauges, multiple-aspect signalling has been provided at 943 and 357 stations respectively. There are 187 and 15 stations on broad and meter gauge trunk routes where multiple-aspect signalling has neither been provided nor programmed so far. Thus about 12.5 per cent of the number of stations on broad and meter gauge trunk routes still remain to be provided with multiple-aspect signalling.

From Annexures XXIX and XXX we find that the progress made on some railways has been unsatisfactory. The Central, South Central and South-Eastern Railways have been trailing behind the others. On main line sections, 237 stations out of 849 on broad gauge and 340 out of 806 stations on meter gauge had been provided with multiple-aspect signalling. Thus about 65 per cent of the stations on broad and meter gauge main lines still remain to be provided with this type of signalling.

362 The implementation of this recommendation has necessarily to be phased. We would urge the Railway Board to take up the provision of multiple-aspect signalling at the remaining stations on a time-bound basis so as to cover all stations on trunk routes and main lines as early as possible.

363 In respect of provision of a warner signal in the rear of outer signal, information ,furnished by the Railway Board shows that in

the lower quadrant territories, there were 24 and 18 stations in this category on the broad and meter gauges as on 30-9-1978 respectively having a separate warner in rear of the outer. Thus, there has been no significant progress in the implementation of this recommendation. The separation of the warner signal from the outer signal has a very important bearing on safety. The recommendation having been accepted should be implemented with a greater sense of urgency.

364 Braking distances and inter-signal distances.—

(Recommendations 176 and 177—Part I, 135 (i), (ii)—Part II)—The Kunzru Committee recommended (Recommendation 55 (i)—Part I) that braking distance trials should be conducted to determine the braking distances for various speeds, loads etc. so as to determine the sighting distance of signals and resiting them, where necessary, on the basis of the results of the trials. The Wanchoo Committee noted that the results of braking distance trials had become available and hoped that these would soon be reflected in the resiting of signals. They further recommended that: —

(i) the minimum sighting, distance for the first stop signal, without pre-warning in two-aspect lower quadrant territory, should be such that the driver was able to observe and obey the signal in time: and

(ii) the distance between the distant and the first stop signals on high-speed routes and the length of the signalling section in automatic signalling territory should not be less than the emergency braking distance.

365 In their remarks, the Railway Board have stated that braking distance trials for the broad and meter gauges have been completed. Resiting of signals to suit the braking distances is being carried out progressively where required. After taking into consideration the results of braking distance trials conducted by the RDSO and the existing speed of passenger and goods trains as well as the higher speed of passenger and goods trains in the formable future, the Railway Board decided in July 1969 that, on the Howrah-Delhi section (via Eastern Railway Grand Chord) and on any other broad gauge sections to be specifically nominated for the running of goods trains at speeds of 72 kmph or above and of passenger trains at speeds of 160 kmph, for which the emergency braking dance is not expected to exceed 1.5 kilometers, the following arrangements should be made:—

(a) In the case of multiple aspect colour light or upper quadrant territory, the distant signal should be retained at its present distance of 670/960/1000 meters, as the case may be, and a second permissive signal to be called the "approach signal" should be provided at a distance of 2 kilometers from the existing home signal. Sighting boards were then to be dispensed with.

(b) In the case of 2-aspect lower quadrant signalling territory where replacement of conventional signalling by multiple-aspect signalling had been planned, permissive signals should be provided— the approach signal being two kilometers from the home signal and the distant signal one kilometer from the home signal. The sighting boards were to be dispensed with.

(c) In the case of remaining conventional 2-aspect signalling territory:

(i) class stations should be converted into 'A' class stations where feasible and the warner located at a point 1.5 kilometers from the first stop signal. The sighting boards were to be dispensed with.

(ii) Where action as proposed above was not possible owing to line capacity considerations, etc. conventional signalling should be replaced by modified lower quadrant signalling with the distant signal located at 1.5 kilometers from the home, provided this is found cheaper than the separation of the warner vide item (iii) below and also provided a sufficiently long continuous section is available for the changeover of the system of signalling.

(iii) Where action as per item (i) and changeover to modified lower quadrant are both not feasible, in place of the combined warner, a separate electrically lit and motor-operated warner should be provided at a distance of 1.5 kilometers from the outer, where feasible and the sighting boards dispensed with; and

(iv) in other areas the existing signalling was to continue, and sighting boards were to be retained.

The Railway Board also decided that the second permissive signal, i.e. an approach signal, should be provided on the Delhi-Howrah, Bombay-Delhi, Bombay Central-Ahmedabad, and the electrified sections of Bombay-Calcutta route.

366 On the basis of the results of braking distance trials on the broad gauge, the Railway Board had issued instructions to

the Railways in October 1968 to provide warning boards as under: —

(i) on sections where the maximum permissible speed of passenger trains was 100 kmph, a passenger warning board was to be provided at one kilometer (or 960 meters is already existing) from the home signal for passenger trains and a goods warning board at 1400 meters for goods trains. These distances were based on the emergency braking distances for goods trains with 450 mm average vacuum and 85 per cent effective vacuum cylinders and for passenger trains with 495 mm overage vacuum and 98 per cent effective vacuum cylinders.

The passenger warning board was to be dispensed with in the case of multiple aspect signalling territories if the distant signals were already at one kilometer or 960 meters or in the case of lower quadrant territories where the distance between the home and warner signal is one kilometer or 960 meters.

(ii) the provision of warning boards at a distance of 960 meters on broad gauge sections with maximum permissible speed of over 72 kmph, and also 48 kmph where adequate visibility was not available, in accordance with instructions issued in February 1963 was to be continued; and

(iii) on meter gauge sections where the maximum permissible speed was more than 48 kmph, warning board was to be provided at a distance of 960 meters from the first stop signal.

The Railway Board have stated that the location of sighting/warning boards on broad gauge sections has been adjusted to bring them in conformity with the results of braking distance trials. On the meter gauge sections sighting/warning boards have been provided at a distance of 960 meters in the rear of the first stop signal.

367 We note that when the Rajdhani Express was to run on the Howrah-Delhi route, the RDSO conducted trials which showed braking distance to be 1325 meters on the level and 1520 meters or 1 in 200 down gradient. In view of the increased emergency braking distance of the Rajdhani Express, the Railways were instructed in August 1971 that on the Rajdhani route where speeds of 130 k.m.p.h would be attained, only one warning board at 1.5 kilometers from the first stop signal should be provided which would be effective for both passenger and goods trains. For the super-fast trains at 110 kmph also, since the braking distance on level was more than 1000 meters, the Railways were instructed to remove the passenger warning boards and retain only the goods warning boards at 1.4 kilometers to serve both. We note that the Central Railway conducted braking distance trials for 22 bogie double-headed Tamil Nadu Express group of trains, and, since the emergency braking distance on level was found to be more than that of the super-fast express trains booked at 110' kmph, they suggested shifting of the warning boards to 1.5 kilometers on the level. The Central Railway also suggested that the warning boards 'should be located after allowing for the reaction time of drivers. We understand that this matter is still under the consideration of the Railway Board.

368 On the question of minimum sighting, distance for the first stop signal without pre-warning in two aspect lower quadrant territories, the Railway Board have stated that drivers of trains while approaching such signals control their train's to the extent necessary to ensure that the braking distance is within the available sighting distance. They have added that with a view to further assisting the drivers, sighting/warning boards for both passenger and goods trains have been provided in the rear of the first stop signal at the braking distance for the maximum sectional speed. The Railway Board also decided in October 19T0 that in automatic signalling territories, where emergency braking distance at the prevailing speeds was not available, an 'attention (double yellow) aspect' signal was to be provided in accordance with the provisions of the Signal Engineering Manual, progressively. It was also impressed on the Railways that emergency braking distance should invariably be catered for in all future automatic signalling installations.

369 The results of the braking distance trials were circulated to the Railways by the RDSO in March 1974. Thereupon, several Railways had sought the guidance of the Railway Board for resiting of signals to ensure that inter-signal distances were not less than the braking distances on the sections. We understand that there still remain considerable deficiencies in the visibility distance for the first stop signal provided in 2-aspect signalling as well as in the inter-signal distances in 2-aspect and multiple-aspect signalling and these do not conform to the emergency braking distances as determined by trials.

370 From the foregoing, it will be seen that, except for the high speed routes, the question of (resiting of signals on the basis of the results of braking distance trials on the remaining sections does not appear to have been taken up so far. Inter-signal distances have considerable bearing on the safe running of trains and the need to resite signals on the basis of braking distances cannot be over-emphasized. Other inter-related issues which have also come up in the meanwhile are whether the inter signal distances should correspond with the service braking distance and also if the braking distance should be set off against the available, visibility distance of the signal. We understand that these issues are presently under the consideration of the Railway Board which should take a very early decision and ensure its speedy implementation.

371 Another aspect on which we would like to make a special comment is the brake power of trains on the basis of which the emergency braking distances have ‘been determined. We note that the sighting/warning boards have been relocated on the basis of emergency braking distances for goods trains with average vacuum of 450 mm and 85 per cent effective vacuum cylinders. Test checks made by Neutral Control staff in respect of brake power available on trains, which have been commented upon by us later in this Chapter, show that the stipulated level of brake power was available in the case of only 12 per cent of the originating trains and one per cent of the terminating trains. It is, therefore, essential that the amount of vacuum and number of 295ffecttive vacuum cylinders must conform to the minimum laid down in the trials conducted on braking distances. Braking distance trails

and resiting of signals should aptly be treated as a composite project from the signal and motive power side and the inter-signal distances should be 'finalised, keeping in view the existing loads and speeds of trains and those expected in the foreseeable future. We propose to go into this matter further and shall advert to it in the subsequent report.

372 Sighting Boards.— (Recommendation 136 (i), (ii) Part II)— The Wanchoo Committee stated that at the cost of a small amount of foreign exchange, it would be possible to import 'suitable reflective material' like scotchlite for use on sighting boards. They considered that in matters which involve safety, considerations of foreign exchange should not 'be allowed to come in the way. They suggested that in addition to sighting boards, such reflective material may be used with advantage on whistle boards, road signs on approaches to level crossings, speed and caution boards, and other indication boards which ordinarily are not lit at night.

373 Initially, the Railway Board decided to use scotchlite reflective material on sighting/ warning boards only. As the use of this material on all the boards indicated by the Wanchoo Committee would entail considerable expenditure mostly in foreign exchange. Due to the problems involved in the import of scotchlite reflective material the. Railways were instructed. To conduct trials using indigenously available Carex reflectors on sighting, boards. We understand that the consensus of the Zonal Railways was that Carex reflectors are not a satisfactory 'substitute for scotchlite reflective materials. Some of the Railways also reported pilferage and

tampering of the Carex reflectors. In the case of breakage of these reflectors the ‘isibility of the yellow strip was known to become poor. The RDSO have stated that the life expectancy of Carex reflectors was about 2 years as compared to 6-7 years for scotchlite reflective material. The Signal Standards Committee 1977 also did not consider the provision of Carex reflectors on sighting boards a satisfactory arrangement. We have been advised by the Railway Board that the relative merits of Carex reflectors and scotchlite reflective material is being used extensively by other Government depart-taken in the matter.

374 It is a matter of serious concern that the implementation of an important recommendation having direct bearing on safety of train operation has been considerably delayed on the ground of lack of foreign exchange. We, feel that there has been a lack of sense of purpose and urgency when the one alternative which was being developed indigenously has been found unsatisfactory in performance. Considering that the requirement of foreign exchange for import of this material cannot be very large and that scotchlite reflective material is being used extensively by other Government departments and "public sector undertakings in the country e.g., roadways, air lines etc. as also the relatively easier availability of foreign exchange, there is no reason why this should not be imported by the Railways also even at this stage.

375 Track Circuiting.— (Recommendation 169—Part I, 144 (i) to (iv), 145 (1) to (iii)—Part II)— The Wanchoo Committee considered that the introduction of track circuiting at stations

was an important step towards ensuring safety of train working and felt that unless energetic steps were taken to improve the pace of' execution of track circuiting works, the target of 200 stations per year sot by the Railway Board may not be achieved. In Part II of their Report they expressed doubts whether the railways were addressing themselves to the task of providing track circuiting with the necessary sense of urgency. They felt that too much was being made 'of the shortage of wooden sleepers and that this factor, instead of being a source of anxiety, had in course of time come to be a cause for complacency. Referring to the difficulty pointed out by the Railway Board regarding bringing into use prestressed concrete ,sleepers for track circuiting in yards due to increased thickness as compared to wooden sleepers, they felt that such difficulty would apply to a few places only and by and large it should be possible to overcome the same. They were of the opinion that with more energetic research and experimentation, it should be possible to evolve suitable alternatives to overcome the hurdles in extending the use of track circuiting. They suggested the following guidelines and targets for the provision of track circuiting: —

(i) first priority should be given to run-through lines at wayside stations on the trunk routes and to all passenger lines at important junctions on both the trunk routes and the main lines. This work should be completed during a period of four years.

(ii) thereafter run-through lines at stations on main line routes and all passenger lines at stations on trunk routes should be track circuited. This should be accomplished in a further period of four years; and

(iii) in the last phase, all passenger lines at stations. on main line routes and at important junctions on branch lines should be taken up for track circuiting. This work should be completed in another two years.

376 In their remarks, the Railways Board stated that the Railways were fully alive to the urgency of the problem and every effort was being made to accelerate the pace of track circuiting and suitable alternatives to track circuiting were also being evolved. They added that the pace of track circuiting works had been accelerated. An indigenous axle counter has already been developed as an alternative to track circuiting and is under manufacture in the railway workshops. The Railway Board also accepted the guidelines suggested for track circuiting but stated that it would not be possible to adhere to the targets indicated by the Wanchoo Committee in view of the very large investment involved, which was likely to be of the order of Rs. 200 crores.

377 It The progress of track circuiting works on the Railways during the last decade in comparison with the performance during the earlier quinquennium is given in Table 45 below.

TABLE 45

Progress of track circuiting on Railways

Position as on	Total number of stations at which track circuiting has been provided
31-3-1963	165
31-3-1968	543
31-3-1978	1926

378 It will be seen that as compared to the average of 76 stations per year during the 5-year period 1963-64 to 1967-68, 139 stations per year, on an average, were track circuited during the 10-year period from 1968-69 to 1977-78. During 1977-78 track circuiting work was completed at 162 stations. This progress is commendable.

379 While the Wanchoo Committee had recommended provision of track circuiting of run-through main lines at all stations on trunk routes and main lines, the Railway Board have given priority to stations on trunk routes and important main lines only and stated that it is planned to complete the work on these by 1980-81. The present position as advised by the Railway Board is shown in Table 46 below.

TABLE 46
Progress of track circuiting on trunk routes and 'important' main lines.

	Trunk routes		Important main lines		Total	
	B.G.	**M.G.**	**B.G.**	**M.G.**	**B.G.**	**M.G.**
Total number of stations	1174	451	680	104	1854	555
Number programmed for provision of track circuiting up to 1978-79	1091	376	361	77	1452	453
Number completed up to 31-12-1978	1012	363	230	67	1242	430
Number of stations where work is not required to be done	57	4	16	..	73	4
Number of stations where work is yet to be programmed	26	71	303	27	329	98

380 Besides 329 broad gauge and 98 meter gauge stations on the trunk routes and 'important' main lines where track circuiting work is still to be programmed, we find that there still remain another 169 broad gauge and 702 meter gauge stations on other main lines where no plans for track circuiting have been made so far. Thus, even the completion of track circuiting of run-through lines on trunk routes and main lines is not yet in sight. We would urge that early action should be taken to get this work done on a time-bound basis.

381 The Railway Board have stated that track circuiting of all passenger lines at important junctions on both trunk routes and main lines has been completed at some of the busy important junction stations and the remaining stations are being taken up progressively. As regards loop (passenger) lines at wayside stations on trunk routes and important main line sections, a beginning has now been made by giving priority to such of the stations where- operating staff do not have a clear view of the loop lines. It has also been stated that in respect of track circuiting of all the passenger lines at wayside stations, it has not been possible to make much headway due to the non-availability of wooden sleepers nor are axle counters available in adequate numbers instead. Paucity of funds under the Signal and Telecommunication Plan head has also been indicated as a contributory factor.

382 In reply to the. questionnaire of the Committee the Railways have stated that due to non-availability/shortage of wooden sleepers the work of track circuiting has gone into

considerable arrears. On the Eastern Railway, track circuiting works sanctioned in 1972-73 are still in arrears. On the Northern Railways, part of the work sanctioned in 1971-72 is still to be completed. The Southern Railway has stated that track circuiting at 21 stations sanctioned during the period 1971-72 to 1977-78 could not be completed for want of wooden sleepers. On the Western Railway, works of track circuiting have gone into arrears by about five years due to non-supply of wooden sleepers. Thus poor 'availability of wooden sleepers and the absence of a satisfactory alternative continue to hamper the progress of track circuiting on the Railways.

383 The Wanchoo Committee, in Para 344—Part II of their Report, had envisaged the use of concrete sleepers as an 'alternative to wooden sleepers for track circuiting. We are sorry to note that there has been very little progress in this regard. We understand that even the improved design of concrete sleepers with composite liner has only recently been cleared for use in track circuiting works with reservations due to inadequate electrical resistance. A satisfactory solution of this problem needs to be found at the earliest for unrestricted use of concrete sleepers in track circuiting. As stated earlier in this Chapter under Permanent Way, the position of supply of wooden sleepers is not likely to improve in future due to scarcity of this resource. It is, therefore, necessary that alternatives like.

concrete sleepers and axle counters are made 'available in the required numbers for completing the work of track circuiting/detection facilities at all stations where these are considered necessary.

384 **Track circuiting of lines between block clearance points.—** (Recommendation 146—Part II)---- The War400 Committee opined that track circuiting must cater for preventing side collisions, With this end in view they suggested that in respect of track circuiting works on run-through lines in progress at present as well as programmed for the future, the policy should be to track-circuit lines between the block clearance points. They urged that in the case of run-through lines which had already been track circuited between fouling marks, the work of providing track circuiting between the block clearance points should be taken up as soon as possible.

385 In their remarks, the Railway Board stated that the decision, to track circuit the main line between fouling marks was taken after careful consideration of financial resources, availability of wooden sleepers and the fact that the proportion of side collisions to the total number of collisions was small. They stated that the cost involved in track circuting between. the block clearance points was more than double that involved in track circuiting between fouling marks. The advantages of the present system thus outweighed those of installing track circuiting between block clearance points. They have added that steps have been taken to provide track circuiting up to the advanced started at 100 vulnerable stations. This work has been completed and commissioned at 25 stations and the balance is being programmed.

386 In reply to the questionnaire of the Committee, most of the, Railways have expressed the opinion that track circuiting between block clearance points was essential from the safety point of view, specially at stations where shunting is performed and the view of the track between starter and advanced starter signals is obstructed from the place of operation of the signals or the advanced starter is located at a full train length from the starter.

387 The Western Railway has suggested that track circuiting must be provided between the block clearance points at all stations on trunk routes and main lines with priority to stations adjacent to automatic block sections and also at all stations on the routes of superfast trains. We note that the Additional Commissioner of Railway Safety, Northern Circle, in his enquiry report on the collision of 103 Up Howrah-Delhi-Amritsar Deluxe Express with Up CPC Special goods train at Naini station on 10-10-1977 also recommended providing of track circuiting or detection. facilities up to the block clearance points.

388 The Railway Board are still going ahead with track circuiting between fouling marks despite the clear recommendation of the Wanchoo Committee that this should be done between the block clearance points. We propose to investigate this matter further and shall advert to it in the subsequent report.

389 **The Automatic Train Control,—** (Recommendations 170—

Part I, 14g (i), (ii) 149—Part II)- The Wanchoo Committee expressed the view that despite the stress laid by the Kunzru Committee, the progress of introduction of Automatic Train Control (ATC) had been slow. They felt that had the trials and installation of ATC been initiated earlier, certain signalling firms in India would have become interested in this field of manufacture by now. They recommended that-

(i) lines on which speeds of 100 kmph or over were permitted should be provided with ATC and it should cover all trains including goods trains running on the section.

(ii) notwithstanding financial considerations, phasing must be done with a sense of urgency and a scheme of priorities should be worked out for trunk routes; and

(iii) the type of ATC equipment being installed on the suburban sections of Howrah. area, which ensures that a driver passing an automatic signal at 'on' must keep the speed of the train below 15 kmph up to the next automatic signal failing which a warning was sounded for five seconds and thereafter automatic application of brakes took place, should be extended to other automatic signalling sections in Bombay, Calcutta and Madras areas.

390 The In their remarks, the Railway Board have stated that-

(i) Automatic Train Control system as recommended by Kunzru. Committee was intended to ensure automatic obedience by the engine crew to the respective indications

exhibited by the signals enroute by giving audible and visible warning to the driver in the cab of the engine when the signal shows danger aspect and should the driver fail to acknowledge the warning, the brakes apply automatically bringing the train to a stop. Before the signal. With the subsequent technological advances-and the evolution of Automatic Train Operation (ATO) and other highly sophisticated systems, this ATC system came to be referred to as Automatic Warning and Stop system (AWS). The indigenous development of AWS has been presently taken up by Electronics Corporation of India Ltd., (ECIL), Hyderabad in association with the RDSO. The prototype developed by ECU, is undergoing field trials on the Eastern Railway and has been found to be satisfactory and compatible with the imported equipment already in use on that Railway.

(ii) For providing AWS equipment, priority would be given to suburban sections and trunk routes on which trains run at speeds of 120 kmph and more.

(iii) AWS has been commissioned on Howrah-Burdwan Chord and Gaya-Mughalsarai sections of the Eastern Railway. The provision of AWS has also been sanctioned for Howrah Burdwan main line; Burdwan-Gaya; Mughal Sarai-Delhi sections and the suburban sections of the Western and Central Railways.

(iv) AWS is it present being provided on the locomotives of only Mail and Express trains. On subrban sections it would cover Electrical Multiple Unit (EMU) trains; and

(v) The functioning of the AWS equipment provided on the Eastern Railway has been satisfactory. Viz., there has been no failure of the AWS equipment on the unsafe side, no accident has taken place on account of a driver overshooting the first stop signal after its introduction, no particular difficulty has been. faced in the maintenance of AWS equipment, the problem of thefts encountered initially has been sorted out and drivers working Rajdhani Express trains have expressed their satisfaction on the performance of the equipment.

391 We note that though the Wanchoo Committee had recommended the provision of AWS on lines with speeds of 100 kmph or over, covering all trains including goods trains, and the Kunzru Committee had also stated that all signals en-route should be brought under a similar scheme- ATC (AWS), the Railway Board proposes to provide AWS only on trunk routes with speeds of 120 kmph or above covering only mail and express trains. Further, only, the first stop signal is proposed to be covered under the present scheme. We, however, find that very little progress has been made even in such a restricted programme. Out of 2780 route kilometers programmed on trunk routes with speeds of 120 kmph and

over and 1128 route kilometers on suburban sections in Calcutta, Bombay and Madras areas, AWS has been provided only on 248 and 94 kilometers respectively. The poor progress in the last fifteen years has been due to reluctance to import the equipment and to excessive time taken for its indigenous development and manufacture.

392 The We consider that the Railway Board should take steps to fulfil at least their diluted commitment of providing AWS on trunk routes and suburban sections at the earliest, In doing so, it will no doubt take full advantage of the available sources of supply in the country and undertake imports if necessary, so as to complete this important safety measure speedily. It is also essential that a time-bound programme is drawn up for extending AWS on all trunk routes with speed of 100 kmph and above, covering all passenger and goods trains.

393 Cab Signalling— (Recommendation 150- Part II)— The Wanchoo Committee felt that it was high time to undertake research and development in regard to continuous cab signalling, however elaborate or expensive this may be so that a greater degree of immunity from accidents could be achieved on sections on which high speed trains run.

394 In their remarks, the Railway Board stated that the RDSO had prepared a report on various cab signalling systems in use in different countries and given their recommendations for selection of equipment to suit Indian conditions. A working

system is under development for the Metropolitan Transport Project (Railways), Calcutta. The RDSO has also suggested that it is necessary to set up a special cell for a detailed study of the technical and economic implications of cab signalling.

395 We note that very little progress has been made in research and development in the field of cab signalling in the last decade and a half after the recommendation was first made by the Kunzru Committee. Technology in this sphere is continuously advancing and several systems are in use in foreign countries. The Indian Railways should take advantage of these developments and evolve a suitable system for use under Indian conditions.

396 Time blocks for maintenance of signalling equipment:— (Recommendation 153 (i), (iii)—Part 10— Several complaints had been received by the Wanchoo Committee that the signalling staff were unable to undertake repairs to the signalling gear at the required time due to non-acceptance of disconnection notices by the operating staff. They were told that often, when disconnection notices were presented to the operating staff for disconnecting the gear for maintenance purposes, such notices were not accepted on the plea of heavy train working and possibility of detention to trains. In their words, "the problem assumes great importance at busy stations where the signalling gear is relatively more intricate and needs intensive maintenance". They attached great importance to this matter and felt that the signalling staff would be apt to restart to short-cut methods for

maintenance of signalling gear unless they get time blocks in which to maintain the gear. They suggested that the whole problem of maintenance of signalling gear should be thoroughly examined, and a practical and safe procedure evolved so that necessary time blocks are available for the maintenance of signalling gear without much difficulty. They opined that provision Tor this should be made when the timetable of the section is being framed. They felt that by making provision in the timetable for an integrated maintenance programme, maintenance of not only the signalling gear but also track by automotive machines, wherever in use, and of overhead installations at stations and on sections could with advantage be undertaken in a coordinated manner. The Wanchoo Committee also commended the directive of the Railway Board, that in planning for the development of capacity on trunk routes, the sectional capacity should be worked out on the basis of 20 hours of train running in a day so that the remaining 4 hours can be set apart for maintenance. They felt that this was a step in the right direction and reflected considerable foresight.

397 We In their remarks, the Railway Board stated that instructions already exist to the effect that disconnection notices issued for maintenance of signalling gears 'should be accepted by the traffic staff when presented and that in order to obviate the chances of their not being accepted, the Signal & Telecommunication branch is required to plan the programme in coordination with the Operating branch sufficiently in advance. They also stated that fixed time blocks for the maintenance of signalling gears would seldom

be required. Even when required, these words could easily be synchronized with the time blocks given for maintenance of track and overhead electrical equipment. They added that the need for coordination between the Operating branch on the one hand and various service departments on the other so that the time blocks required by them for maintenance work could be synchronized and provided with the least dislocation to train operations was accepted. However, for this purpose they felt that it was neither necessary nor practicable to make any provision for fixed time blocks in the timetable. It has been stated that the purpose would be best served as was being done now by coordinating the requirements of time blocks of various departments and providing for necessary allowance in blocks after taking into consideration the operating conditions. Thus, the Railway Board did not accept the recommendation for making provision of fixed time blocks in the timetable nor have they offered any solution to this vexing problem which has serious repercussions on safety.

398 In their replies to the questionnaire of the Committee, the Railways have informed us that considerable difficulty is still being experienced in getting disconnection notices accepted and the problem of finding time blocks for maintenance of signalling gear still persists. In view of the problems expressed by the Railways we will go into this matter further and advert to it in the subsequent report.

399 **Inspection of signalling equipment—** (Recommendation

154—Part II)— The Wanchoo Committee considered that with the increase in traffic density on several sections, rationalization in the jurisdiction of the inspectors and largescale additions and modifications to signalling installations, inspections of signalling equipment at stations or in block cabins should be intensified and the periodicity of testing of signalling equipment should be suitably modified.

400 In their remarks, the Railway Board have informed us that due to considerable increase in the signalling and telecommunication equipment and resultant increase in workload, it has not been possible to increase the frequency of inspection with the present strength of signalling and telecommunication officers. However, the Railways were advised to ensure that inspections as per paras 712 and 715 of Indian Railways Signal Engineering Manual are carried out meticulously and in great detail and that suitable steps should be taken to improve the quality of inspections at all levels. The Railways were also asked to intensify inspections: and closely watch the follow-up action.

401 We note that the question of increase in the periodicity and intensification of inspections and testing of signalling equipment was discussed in the conference of Chief Signal and Telecommunication Engineers held in August, 1970. They were of the view that increase in the frequency of inspections could be considered only after the strengthening of the maintenance organization had been examined. They opined that the stipulations laid down for inspection in the Indian Railways Signal Engineering Manual were meant mainly for conventional type of signalling. With the addition of

sophisticated equipment on the intensively worked sections, the entire problem would have to be viewed on the basis of type of equipment, density of traffic and level of inspection. The conference suggested that the provision regarding frequency of inspections laid down in the Indian Railways Signal Engineering Manual should be followed till revised schedules, drawn up by the RDSO, were examined and accepted.

402 A revised schedule of maintenance of electrical and mechanical signalling equipment by maintainers was circulated by the Railway Board in February, 1974. The revised schedule lays down various jobs to be done and frequency of maintenance by maintainers of electrical and mechanical signalling equipment separately. While the Wanchoo Committee recommended intensification of the inspections by inspectors and officers, the revised schedule covers the scope of initial maintenance by maintainers only. No effort appears to have been made towards intensification of inspections by inspectors and officers.

403 In the replies of the Railways to the questionnaire of the Committee, it has been stated that inspections by district signal inspectors on the Northern and South Central Railways, and those by signal and telecommunication officers on the Eastern, Northern, Southern and South Central Railways have not been as meticulous and detailed as was desirable. This has been due to shortage of district signal inspectors and divisional/assistant signal and telecommunication engineers on these Railways. The Western Railway has stated that maintenance and inspections of signalling gears on the

Bombay suburban section are not being done on schedule due to inadequate strength of maintainers and signal and telecommunication officers. This Railway has added that due to heavy traffic, the availability of maintenance time was inadequate and against the locally stipulated weekly maintenance by the maintainer, even proper fortnightly maintenance as required by the Manual, was not possible until the strength of maintainers was increased. Further the strength of divisional officers has been reported to be only 40 per cent of the recommended. yardstick as a result of which officers are not having time even to ensure the compliance of their directions. The South-Central Railway has stated that though the inspection schedules are being followed by the inspectors, these inspections are not sufficiently detailed from the safety point of view. Similarly, the South-Eastern Railway has stated that though the schedules of inspections are being followed, the quality of inspections and analysis of failures/accidents could improve with augmentation of strength and relief from miscellaneous stores work etc.

404 The Railway Board have advised us that the Efficiency Bureau had formulated yardsticks for officers and supervisors in 1976 and 1978 respectively, after taking into account various factors like nature and sophistication of equipment, traffic density, interference to inspection/ testing and the periodicity of inspections as laid down in the Indian Railways Signal Engineering Manual. These yardsticks have since been accepted by the Railway Board. They have, however, stated that due to various economy measures in vogue from time to time and also the general ban on creation of posts since 1974. it has not been possible to create posts as necessary to

make up for the shortage of supervisors and officers as per the yardstick. They have further stated that, for the new assets, posts are being sanctioned, though less than recommended as per the yardsticks. They have expressed the hope that it would be possible to make up for the shortage as soon as economy measures are relaxed over a period of time.

405 The Railway Board have added that the periodicity of inspections could not be improved as recommended by the Wanchoo Committee due to the shortage of supervisors/officers. The quality and extent of inspection has, however, been sought to be improved.

406 We thus find that the strength of officers and inspectors in the signal and telecommunication department on most Railways is not commensurate with the existing workload. It is surprising that even after deficiencies in strength had been brought out in the study of the Efficiency Bureau and accepted by the Railway Board, the Railways have been asked to rationalize the workload on the basis of the existing strength. It is disquieting that for the new equipment also, posts are not being provided as per the yardstick. Intensification of inspections apart, it would thus appear that ever the extent schedule of inspections are not feasible due to inadequate strength of officers and inspectors. This is a serious matter to which we would draw the attention of the Railway Board and urge that immediate steps should be taken to rectify the situation and ensure that meaningful inspections by officers and inspectors of the signal and telecommunication department are carried out.

We further consider that any economy in this regard would be misconceived.

407 We Provision of rudimentary interlocking at non-interlocked stations:— (Recommendation 165—Part 1)— The Wanchoo Committee observed that the Kunzru Committee had recommended provision of rudimentary interlocking at all stations on the broad and meter gauges in a year's time, and within a reasonable period in the case of stations on narrow gauge sections where the frequency of train services was more than three trains each way. They found that there were a number of stations on the broad and meter gauges which had not been provided with rudimentary interlocking though the Railway Board had directed the Railways for complete this work by 31-3-1964. They hoped that this safety provision would be completed in a short time.

408 In their remarks, the Railway Board have stated that work of provision of rudimentary interlocking at stations on broad and meter gauge sections has already been completed except at a few stations where it has been planned. The progress of interlocking of stations may be seen from Table 47 below.

TABLE 47

Progress of interlocking at stations

Year	Number of non-interlocked stations on all Railways		
	Broad Gauge	Meter Gauge	Total

1962-63	108	418	526
1966-67	33	82	115
1977-78	19	46	65

409 It will be seen that 65 stations on the broad and meter gauges still remain to be interlocked. The railway-wise position is shown in Table 48 below.

TABLE 48

Railway-wise position of non-interlocked stations

Railway	Number of non-interlocked stations as on 31-3-1978	
	Broad Gauge	**Meter Gauge**
Central	5	Nil
Eastern	4	Nil
Northern	1	5
North-Eastern	Nil	12
Northeast Frontier	2	9
Southern	1	7
South Central	1	Nil
South-Eastern	3	Nil
Western	2	13
Total	**19**	**46**

410 We note that, out of the above, the Railway Board have given specific dispensation for not providing rudimentary interlocking at 12 stations on meter gauge. At most of the other stations the Railways have not planned provision of rudimentary interlocking on the plea that stations are either on river ghats or on sections worked under 'one engine only' system, or are on; sections having very light traffic/open for goods traffic only, etc. In case of stations on narrow gauge sections. the Railway Board decided in 1969 that rudimentary interlocking should be provided where there are six trains each way

instead of three trains as was recommended by the Wanchoo Committee. We note that as on 31-3-1978. there were 242 non-interlocked stations on the narrow gauge.

411 We are of the opinion that even in the case of station on river ghats or stations on sections worked under 'one engine only' system the possibility of a derailment at the points is not precluded if the stations are non-interlocked. We, therefore, reiterate what the Kunzru and Wanchoo Committees had suggested, namely that rudimentary interlocking should be provided at all stations on the broad and meter gauges. In respect of the scope of work on the narrow gauge, we will go into this further and advert to it in the subsequent report.

412 Failure of signal and interlocking gears:—

(Recommendation 71—Part I)- The Wanchoo Committee found that the incidence of failure of signal and interlocking gears, after a marked decrease in 1963-64, had been steadily increasing every year. The same pattern was discernible in the case of failures of block instruments, where, however, a reversal of the trend was noticed during 1967-68.

413 In their remarks, the Railway Board have stated that in the 5- year period from 1963-64 to 1967-68, the number of signal and inter-locking failures had increased by nearly 20 per cent whereas the number of lever units, which indicate the extent of equipment in use, had increased by about 39 per cent. Therefore, they did not consider the increase in the number of failures abnormal. The increase in the number of failures

of block instruments in the earlier years was attributed to the introduction of improved "Lock and block" instruments on double line and tokenless block instruments on single line, resulting in the addition of considerable field equipment such as reversers, treadles and track circuits. This also increased the failure potential due to theft and interference. The Railway Board have added that continuous watch is kept at all levels by signal and telecommunication officers and staff to ensure proper preventive maintenance and keep down the signal failures to the barest minimum.

414 In reply to the questionnaire of the Committee, some Railways 'have furnished information regarding the number of failures of signal and interlocking gears and block instruments during the 10-year period ending 1977-78. This is given in Annexures XXXI and XXXII. In Table 49 below we have compared the failure position during 1976-77 and 1977-78, separate information in respect of which is available from all the Railways excepting the Central Railway, with that obtaining, in 1966-67 and 1967-68 (after excluding the figures for Central Railway) which was analyzed by the Wanchoo Committee.

TABLE 49

Failures of Signal and interlocking gears and block instruments

Year	Failure of signal interlocking gears		Failure of block instruments	
	Number	Incidence per million train kilometers	Number	Incidence per million train kilometers

1966-67	27,789	72.91	12,754	33.46
1967-68	28,089	71.16	11,385	28.84
1976-77	39,616	90.2	8,904	20.3
1977-78	42,620	95.2	9,362	20.9

Annexures XXXI and XXXII and Table 49 above give figures of incidence of failures of signal and interlocking gear per million train kilometers on the same lines as was done by the Wanchoo Committee. These do not take into account the population of such installations on the Railways, the number of which has been continuously increasing. We will examine this matter further in the subsequent report.

415 We find that there was an increase in the incidence of failures of signal and interlocking gears when related to the traffic density during 1976-77 and 1977-78. In the case of block instruments, the incidence of failures has shown improvement. We would urge the Railway Board to take steps to check the rising trend and bring down the failure rate of signal and interlocking gears.

416 **Track Circuit failures: —** (Re commendation 172-Part 1) — The Wanchoo Committee urged that since track circuits are an important aid to safety in railway operation, efforts should be intensified to reduce the failure of track circuits to the maximum extent possible. They had also noted that Northern Railway had been consistently having the highest number of track circuit failures during the 4-year period from 1964-65 to 1967-68.

417 In The Railway Board stated that the increase in the number of track circuit failures was largely due to theft of track circuit equipment and connections, e.g. transformers, relays, condensers, track loads, etc. and also inferior quality of the fiber insulation used for block joints. They added that block joint insulation made out of injected nylon, which is considerably tougher than fiber, have now been adopted as the standard and the number of failures is likely to come down. They also stated that the incidence of track circuit failures due to failure of insulation joints was being taken care of by progressive introduction of glued joints. This type of joint is very reliable and has a long-life expectancy.

418 *The actual contents are not available with scanned copy and whatever has been written under 418 is the repetition of 416. Either it is typographical mistake, or the contents left out due to oversite.*

419 *The actual contents are not available with scanned copy and whatever has been written under 418 is the repetition of 416. Either it is typographical mistake, or the contents left out due to oversite.*

……. find that as compared to 3762 track circuit failures in 1967-68, the number of failures in 1977-78 increased to 4936 (excluding those on the Central Railway). Considering the increase in number of stations which have been track-circuited during the same period, i.e. from 543 stations in 1967-68 to 1926 in 1977-78, it would appear that the incidence of failure 'of track circuits have come down.

Examining the position on individual Railways, we find that the Northern Railway had the highest number of track circuit failures followed by the Western and Eastern Railways. These Railway Administrations should analyze the causes of failures and take steps to bring them down.

420 Overhaul and Replacement of signalling gear:—

(Recommendations 173 and 174—Part I)— The Wanchoo Committee found-the shortfall in the replacement of worn-out lever frames during 1967-68 considerably less than in the previous years but the number of worn-out block instruments in need of replacement was the highest of the previous five years. They stressed the need for clearing the shortfall in the overhauling and replacement programme for lever frames and block instruments, investigating the factors responsible for failures of signal and interlocking gears and laying down yardsticks for determining the strength of block, electric and mechanical signal maintainers.

421 The Railway Board had stated that efforts to clear the shortfall in the overhaul and replacement of lever frames and block instruments would be intensified. They stated that the present procedure for investigating factors responsible for failure of signal and interlocking gears on different Railways was under review and a revised uniform procedure was proposed to be adopted on all the Railways. The Railway Board added that block instruments, even though in need of replacement, have been duly overhauled and placed in service and are, therefore, not safety hazards. In so far as the increase in the

number due replacement in 196768 was concerned, they stated that block instruments were provided in batches, and they became overdue replacement simultaneously. The Railway Board have added that a revised formula for computing signalling and telecommunication units, taking into account the sophisticated signalling which had been commissioned in the last few years had been drawn up and advised to the Railways.

422 We find that in July 1969, the Railway Board had advised the Railways that overhauling of lever frames, block instruments and other safety equipment should be carried out according to schedules laid down. The Railways were also advised that whenever the existing signalling equipment needs replacement on age-cum-condition basis, replacement of such equipment should be carried out before the equipment gets worn out so that safety is not jeopardized. The Railways were urged to take special measures to wipe out the shortfall in the overhaul and replacement of lever frames, block instruments and other signalling and interlocking equipment.

423 We In reply to the questionnaire of the Committee, the Railways have-furnished information regarding the shortfall in overhauling and replacement of lever frames and block instruments. This is given in Annexures. XXXIV and XXXV. The position is summarized in Table 50 below—

TABLE 50

Short fall in overhaul and replacement of lever frames and block instruments on all Railways during 1967-68 to 1977-78

Year	Lever frames		Block instruments	
	Shortfall in over-haul	Shortfall in replacement	Shortfall in over-haul	Shortfall in replacement

1968-69	163	12	144	14
1969-70	148	19	155	16
1970-71	157	7	156	20
1971-72	306	33	269	Nil
1972-73	340	35	232	30
1973-74	376	42	398	16
1974-75	522	44	463	16
1975-76	353	60	462	20
1976-77	314	53	604	4
1977-78	432	101	470	

424 We find that the shortfall in overhaul of lever frames and block instruments and replacement of lever frames has sharply increased in recent years as compared to the position obtaining prior to 1970-71. According to the Railways, the main reason for this shortfall is non-finalization of the yardsticks for maintenance staff and shortage of staff. This is a serious matter and if left unremedied, can only lead to further deterioration and serious repercussions. Special efforts in this regard are called for on the Eastern, Southern, South Central and South-Eastern Railways where the backlog of overhaul of lever frames has increased considerably during 1977-78 as compared to the previous years. Backlog in replacement of lever frames on the Eastern and Northern Railways had increased substantially during 1977-78 as compared to the previous year and needs to be brought down. Shortfall in overhaul of block instruments had increase steadily from 1971-72 to 1976-77. During 1977-78 there was a drop in this respect on most Railways and the Railway Administrations should continue: their efforts to bring this down even further. Shortfall in replacement of block instruments had decreased during the last two years.

425 From the foregoing we find that the Wanchoo Committees recommendations for clearing the backlog of overhauling of lever frames and block instruments and replacement of lever frames not only remain unimplemented but there has been a distinct deterioration in the situation. We would urge the Railway Board and the Railway Administrations to take urgent steps to bring about an improvement in this respect.

426 We Regarding yardstick for signal maintenance staff the Railway Board have stated that yardstick for different categories of maintenance staff would be worked out on the basis of total number of revised units on the Railways. We note that a Committee of Chief Signal and Telecommunication Engineers had suggested yardsticks for maintenance staff, this yardstick, as further amended by the Efficiency Bureau of the Railway Board, was discussed at the Thirteenth Conference of Chief Signal and Telecommunication Engineers held in July 1978. They felt that the yardstick, if uniformly adopted, would result in large-scale upheavals in the present strength on various Railways. It was decided that it would not be practicable for a big railway system like the Indian Railways to have a uniform yardstick and the Railways were advised to evolve local yardsticks for mechanical and electrical signal maintainers and signal inspectors Grade III. Thus, the Wanchoo Committee's recommendation in this respect remains unimplemented. We would go into this matter further and advert to it in the subsequent report.

Motive Power

427 The last decade has seen considerable changes on the motive power front. Steam power which had been dominating the traction scene for more than a century, has given place to more efficient and modern diesel and electric traction. During 1977-78, diesel and electric traction together accounted for 73 per cent of the total passenger and freight train kilometers and 83.2 per cent of the total gross tonne kilometers carried on the Indian Railways. With the introduction of diesel and electric traction appreciable changes in the holding of different types of locomotives have also taken place. During the 10-year period ending 1977-78, the number of steam locomotives decreased from 10,226 to 8,215, while diesel locomotives increased from 892 to 2025 and electric locomotives from 429 to 901.

428 This change in traction necessitated not only the creation of large-scale facilities for proper maintenance of diesel and electric locomotives, but also for the' training of staff to look after and handle these costly assets in a satisfactory manner. Compared to steam, diesel and electric locomotives are more sophisticated and call for the adoption of technology which is comparatively new to this country. We appreciate that the effort required on the part of the Railways to bring about this fundamental change in the traction scene, without causing any setback to train operations and without retrenching any staff rendered surplus on account of shrinkage of steam traction must have been considerable. It is against this background that we have reviewed the implementation of the

recommendations made by the Wanchoo Committee on the subject of motive power.

429 The Wanchoo Committee made 45 recommendations relevant to motive power. Out of these, items 175 and 181 of Part I, 159 to 163, 165 to 167(i) and (ii), 169 to 182, 185, 190 and 191 of Part 11 have been either implemented or appropriate action in each case has been initiated by the Railway Board. Recommendations 164 and 174 of Part H were not accepted by the Railway Board. All the aforesaid recommendations together with action taken/ views thereon as advised by the Railway Board are given in the Appendix to this report. Our detailed review of the remaining recommendations is contained in the following paragraphs.

430 Engine Failures: - (Recommendations 179 (1), (ii), 180—Part I)—The Wanchoo Committee found that during 1967-68, the majority of the Railways were unable to achieve the targets laid down for the broad and meter gauges in respect of steam engine failures. They noticed that the performance on the Eastern, Southern and Western Railways on the broad gauge and the North-Eastern on the meter gauge was much below the target. They observed that the performance of diesel and electric engines in kilometers per engine failure was on the low side and stressed the need to improve the same.

431 We In their remarks, the Railway Board had stated that the target of kilometers per engine failure was raised from 150,000 to 200,000 in

1967 as the earlier targets had been achieved by most of the Railways. The increase was made since it was considered that the target should be something better than what had already been achieved. They have advised us that engine failures are being analyzed and remedial action is being taken by different Railways as a regular measure. Recurring adverse features are discussed in the Diesel Maintenance Group meetings, Loco Standards Committee, Electrical Standards Committee, etc. Where necessary, adjustments in the existing preventive maintenance schedules are made. Refresher courses for locomotive drivers cover related trouble-shooting and technical standing orders are issued for the guidance of supervisors. Finally, recourse is taken to punishments for enforcing correct maintenance practices.

432 Steam Engine Failures:— The Railways have furnished information regarding the incidence of steam engine failures during the 10-year period ending 1977-78. The engine kilometers per engine failure on the broad and meter gauges of all the Railways during this period are given in Annexures XXXVI and XXXVII. We find that on the broad gauge there has been continuous deterioration in the performance of steam engines from 1968 to 1975, during which period the all-Railway average of engine kilometers per engine failure decreased from 180,000 to 59,000 only against the Railway Board's target of 200,000 engine kilometers per engine failure. This was followed by improvement in the two years 1975-76 and 1976-77. However, during 1977-78, the all-Railway average again dropped to 87,000 engine kilometers per engine failure as compared to 122,000 in the previous year. Taking the

Railways individually, we find that, except for Western, no other Railway was able to achieve the Railway Board's target.

433 On the meter gauge also the performance of steam engines dropped continuously from 172,000 kilometers per engine failure in 1968-69 to 52,000 in 1974-75. The position improved thereafter and in 1977-78 the all-Railway average of engine kilometers per engine failure rose to 120,000. We find that except for the Northern, Southern and South. Central Railways, no other Railway was able to achieve the Railway Board's target of 200,000 engine kilometers per engine failure. On the Central, North-Eastern, Northeast Frontier and Western ,Railways, where the performance was much below the target, the kilometers per engine failure in 1977-78 were 26,000, 81,000, 75,357 and 112,000 respectively. There was serious deterioration in the performance of Central Railway during that year as compared to the previous years.

434 **Diesel Engine Failures: —** From the information furnished to us by the Railways we have examined the position of diesel engine failures during the 10-year period ending 1977-78. This is given in Annexures XXXVIII and XXXIX. We find that on broad gauge there has been considerable deterioration during the last ten years, the all-Railway average of engine kilometers per engine failure having dropped from 222,000 during 1968-69 to 70,700 during 1977-78. It will be seen that during 1977-78, except for the Southern Railway no other Railway was able to achieve the target of 200,000 engine kilometers per engine failure laid

down by the Railway Board. The performance on the Central, Eastern, Northern, South Central, South-Eastern and Western Railways was much below the target. On the Northern and South-Eastern Railways the deterioration in performance was more pronounced during 1977-78 as compared to the previous year.

435 On the meter gauge, during 1977-78, except for Southern Railway, no other railway was able to achieve the target. The performance on the Northern, Northeast Frontier, South Central and Western Railways was much below the target. There was considerable deterioration in the performance of South-Central Railway during 1977-78 as compared to the previous year. The need for improvement in the performance of diesel: engines is thus clearly indicated.

436 **Electric Engine Failures:—** The position of electric engine failures on broad gauge, during the ten-year period of our study is given in Annexure XL. It will be seen that during 1977-78 none of the Railways except Western Railway was able to achieve the target of 200,000 kilometers per engine failure laid down by the Railway Board. The performance on all the other Railways was very poor.

437 The above analysis shows that as far as engine failures are concerned, the position of steam, diesel and electric locomotives has been unsatisfactory and their performance has fallen much below the target laid down by the Railway Board. No specific reasons for this deterioration have been given either by the Railway Board or the Zonal Railways nor has any

indication been given of the action contemplated to improve the position. The matter calls for urgent and concerted efforts to reverse this trend, particularly when such expensive assets are involved.

438 **Provision of Speedometers/ Speed Recorders on Engines:—** (Recommendation 178--Part I)— The Wanchoo Committee held the view that since every driver working a train is required to observe some speed limit or the other, all locomotives working trains should be equipped with speedometers. They also considered it essential that even though the work of providing speedometers had to be carried out on the basis of a phased' programme, a target should be laid down in regard to the provision of this aid on all locomotives.

439 The Railway Board have advised us that all locomotives working mail and express trains are fitted with speed recorders and all those on passenger services with speed indicators. Most of the locomotives working goods trains have been fitted with speed indicators and efforts are being made to provide them on 'the others also.

440 From the comments of the Railways we find that on the Eastern Railway 40 per cent of electric locomotives hauling goods services are still running without speedometers. The South-Eastern Railway has stated that there have been numerous difficulties in maintaining the VDO type speedometers and speed recorders and availability of these in working order on electric locomotives working good's trains is around 50 per

cent only. On most Railways steam locomotives working goods trains still remain to be provided with speedometers. The Northern Railway has stated that speedometers are being gradually fitted in a phased manner on steam. locomotives working goods trains. The Northeast Frontier Railway has indicated that a programme has been drawn up for fitting speedometers on steam locomotives working goods trains.

441 From the annual reports of the Commission of Railway Safety, we find that on a number of occasions, the deficiency of speedometers on important trains has been pointed out. In the inquiry report on the collision of 43 Up Darjeeling Mail with H-186 Up Habra Local at Ultadanga Road station on Eastern Railway on 29-1-1975, the Additional Commissioner of Railway Safety had remarked that a disturbing feature was that the locomotive of 43 Up Darjeeling Mail had not been fitted with a speed recorder.

442 We find that the recommendation of the Wanchoo Committee, accepted by the Railway Board, has still not been implemented and the Railway Board's claim in this regard is not corroborated to the information supplied by the Railways. The Railway Board must ensure that speedometers/speed recorders are provided on all locomotives working trains and no locomotive which is to work a train leaves the shed or yard without a speedometer/speed recorder in working order.

443 **Development of a Reliable Indigenous Speedometer-cum-Speed Recorder:—** (Recommendation 183-Part II)- It had come out in evidence before the Wanchoo Committee that the VDO type speedometer was not suitable for locomotives. It had been indicated that this speedometer was sluggish and did not show the speed correctly when decelerating, specially in the lower speed range, the indication given being higher than the actual speed of the locomotive. The Wanchoo Committee urged that energetic steps should be taken to see that a more suitable and reliable type of speedometer-cum-speed recorder is manufactured indigenously for use on locomotives.

444 The Railway Board stated that the development of an alternative design of speedometer-cum-speed recorder is being pursued actively. They have advised us that for developing indigenous manufacture of speedometer-cum-speed recorder, different types of equipment have been considered, viz., DEUTA type manufactured by Deuta Works, Germany; TELOC type manufactured by M/s. Hasler, Berne Switzerland; Beacon/Excella type and electronic type instrument developed by Mis. Electronic Corporation of India Ltd., Hyderabad. However, so far it has not been possible to develop a reliable type of indigenous speedometer-cum-speed recorder and efforts are continuing to find a suitable speedometer which would work satisfactorily under Indian conditions. The Railway Board have also informed us that meanwhile VDO type speedometers/ speed recorders manufactured by M/s.

International Instruments (P) Ltd., Bangalore, are being used on steam, diesel and electric locomotives and electric multiple units. These instruments have been in use since 1963 but their performance has not been entirely satisfactory. Some of the limitations of the VDO speed indicators and speed recorders as indicated by the RDSO are: —

(i) Speed indication is inaccurate in the lower speed range.
(ii) recording arrangement is on time basis and not distance.
(iii) there being no compensation for tyre wear, it is not very accurate; and
(iv) the operation of the instrument is not trouble-free and there are frequent failures, etc.

The Railway Board have stated that despite the unsatisfactory performance of these speedometers there was no alternative but to use this equipment which is the only one available indigenously at present.

445 In respect of the other types of speed recording and indicating instruments which have been considered for development, the Railway Board have informed us that Indian Railways have hardly any experience with DEUTA type of instruments which are in use on the German Railways. These instruments are not considered rugged enough for steam locomotives and detailed evaluation tests and trials are proposed to be conducted. Ordering of the trial sets, however, could not be done so far. TELOC instruments of Hasler make have been in use on the Indian Railways for a long time and their performance has been found satisfactory. The possibility of manufacturing this type of

instrument by the Signal and Telecommunication Workshops of the Central Railway was examined but was not found feasible. A number of private firms were also considered but it has not been possible to entrust any one of them with the setting up of facilities for indigenous manufacture of TELOC instruments due to heavy capital investment and requirement of foreign exchange for import of components and raw materials. Dialogue has, however, been reopened with M/s. Hasler of Switzerland for collaboration in setting up manufacture of their speedometers in a railway workshop and this firm has been asked to submit a preliminary project report. It has been stated that development of electronic type of speed indicators and recorders is being pursued with M/s. Electronic Corporation of India Ltd., Hyderabad. After detailed technical discussions and clearance of the design by the RDSO, an order for ten sets of electronic speed, time and distance data recorders for locomotives has been placed on this firm. These instruments have been designed specifically for diesel locomotives and a similar instrument for electric locomotives is under development.

446 Thus even after 10 years, the Railways still have no satisfactory design of a speedometer. We cannot help feeling that if a more determined effort had been made by the Railway Board, a suitable speedometer could have been developed during this period.

447 **Fitment of speedometer on meter gauge diesel locomotives:-** (Recommendation 184—Part 11)— The

Wanchoo Committee observed that a number of diesel locomotives on the meter gauge were fitted with speedo-meter-cum-recorder below the sill of the: look-out panel at the short hood end and the driver had to turn back in an inconvenient position to took at the speedometer when the locomotive was being driven with the long hood leading. They suggested that either the speedometer on meter gauge diesel locomotives should be repositioned on the control desk or alternatively, another speedometer may be provided so that the driver can refer to it conveniently.

448 We The Railway Board had accepted this recommendation. Also, consequent to the recommendations made by the Additional Commissioner of Railway Safety in his enquiry report on the derailment of 4Dn Assam Mail between Samuktala Road and Salsalbari stations on the meter gauge section of the Northeast Frontier Railway on 28-9-1967, they had decided to fit an additional VDO speed indicator on the cab of YDM-4/YDM-4A class of locomotives. The Railway Board have advised us that another speed recorder has been provided so that one or the other is always in front of the driver.

449 From the comments of the Railways we note that the second" speedometer has been provided on all diesel locomotives on the Northeast Frontier Railway only. On the Southern Railway the second speedometer has been provided only on meter gauge diesel locomotives working mail (express trains. The Northern and Western Railways are still to procure the-materials for the job. The Western Railway has informed us that in the mean-while, speedometers on the mail and

express locomotives are being repositioned on the driver's control stand so that he can read the same while working in any direction. The South-Central Railway has stared that the-speedometer on meter gauge diesels has been repositioned at a convenient place.

450 From the foregoing we find that, while the recommendation has been implemented on some Railways, on the Northern, Western and Southern Railways it remains to be fully implemented in spite of Railway Board's clear directive on the subject issued nine years ago.

451 **Maintenance of speedometers:**

(Recommendation 186—Part 11)— The Wanchoo Committee noted that the incidence of ineffective speedometers on some Railways was very high. They suggested that until facilities and the necess,7q expertise could be built up in the locomotive sheds to repair defective speedometers efficiently, it would be a wise policy to replace defective speedometers from reserve stock and send the old units to the workshops for repairs. They recommended that simultaneously a detailed technical survey of defective speedometers and the intervals at which the components required attention in the workshops should be made and, on the basis of this survey, remedial measures should be evolved so that a target for servicing of speedometers not oftener than once a year can be achieved.

452 We The Railway Board have stated that the schedule of servicing of speedometers is based on the recommendations made by the

manufacturers and that this would be modified, if necessary, in the light of experience gained.

453 We In view of the frequent reports received from the Railways that a substantial number of speedometers/speed recorders on passenger locomotives were not in working order, the Railway Board issued instructions in May 1968 asking the Railways to set up a central speedometer repair organization on each railway and to keep up to 20 per cent spare instruments and sufficient number of spare cables/gear boxes etc. to ensure that no locomotive required to be fitted with a speedometer,/speed recorder was sent out to work trains without necessary equipment in working order.

454 In their replies the Railways have indicated that the performance of VDO speedometers supplied by M/s. International Instruments (P) Ltd., Bangalore, is riot at all satisfactory and their reliability is extremely poor even after following the maintenance schedules recommended by the manufacturers. Electric locomotives of the Northern Railway fitted with VDO speedometers are reported to be giving erratic readings inspite of being subjected to monthly checks and adjustments. Difficulties regarding supplies of spares are being experienced by the Northeast Frontier and the South-Central Railways. On the latter Railway speed recorders/speedometers on 100 out of 657 locomotives are defective and inoperative due to non-availability of spares. It has been stated that the proprietary firm has been repeatedly failing to meet its commitment for supply of spares to the Railways. On, the Northern Railway, 33 WDM-4. diesel locomotives (about 50 per cent of those

homed at Mughalsarai) are running with defective speedometers for want of spares.

455 We have examined the annual reports of the Commission of Railway Safety from 1969 to 1977 and find that year after year they have been pointing out the inadequate maintenance of speedometers and speed indicator-cum-speed recorders on locomotives. The Additional Commissioners of Railway Safety had also commented adversely on the maintenance of speedometers/speed recorders in their inquiry reports on a number of serious accidents. It is disquieting that during 1977-78 alone, out of 19 serious accidents in the categories of `collisions' and 'derailments' which, were enquired into by officers of the Commission of Railway Safety, the unsatisfactory maintenance and non-provision of speedometers had come in for severe criticism in inquiries on six accidents.

456 Maintenance of speedometers and speed recorders was discussed at length at the Forty-seventh Meeting of the Loco Standards Committee held in March, 1978 and on their recommendations the Railway Board have now decided that—

(i) for all main line diesel locomotives, Hasler speed recorder with electric. drive would be imported.

(ii) VDO speed recorders in service would be kept going by obtaining supplies of spare parts from established manufacturers; the Railways would also, explore the possibility of making those components which are not readily available in their respective tool rooms and of getting these developed by trade.

(iii) wherever it is not possible to maintain VDO speed recorders by obtaining indigenous supplies of spare parts and it becomes necessary to replace them, these would be replaced by imported Hasler Speed Recorders; and

(iv) the development of an electronic type speed recorder by M/s. Electronic Corporation of India Ltd., and another one by M/s. International Instruments (P) Ltd., would be followed up.

457 This is a clear case where things have been allowed to drift and although ten years have elapsed since the recommendation, no appreciable headway has been made either in the manufacture of a suitable speedometer/speed recorder or in the proper maintenance of the instruments which are presently in use. Thus, this recommendation of the Wanchoo Committee remains unimplemented. We hope that the Railway Board will now expedite the action proposed by them in this regard.

458 Driver's Vigilance Control Device:— (Recommendations 187, 188, 189—Part II)—The Wanchoo Committee suggested that within the shortest possible time diesel and electric locomotives should be equipped with driver's vigilance device. They stated that all new locomotives manufactured at Diesel Locomotive Works and Chittaranjan Locomotive Works should be fitted with this device; before they are sent. to the Railways. They also suggested that while the 'process of installation of the driver's vigilance device is

continuing, the Administration would take steps to carry the staff with them in regard to the utility of this device.

459 In their remarks, the Railway Board stated that provision of, driver's Vigilance Device (also referred to as Vigilance Control Device) on all electric and diesel locomotives was an accepted policy. 928 diesel locomotives have been fitted with Vigilance. Control Device and the remaining diesel locomotives are gradually being provided with improved type of this device produced indigenously. All new locomotives manufactured at Diesel Locomotive Works, Varanasi, are also being equipped with Vigilance Control Device. An indigenous Vigilance Control Device has been developed and is being produced by Signal Workshops, Podanur, and that after successful service trials, these will be fitted on all electric locomotives. The Railway Board have advised that drivers are being given training in operation and utility of the Vigilance Control Device so that there is no reluctance on their part in accepting and properly operating this device. During their inspections the safety officers and counsellors and locomotive inspectors also impress upon the drivers the usefulness of the device.

460 From the comments of the Railways, we find that so far for types of Vigilance Control Devices. conforming to WABCO, HENSCHEL, BENI and RDSO designs have been on trial so far. The Railways have stated that no decision has yet been taken regarding the type of device to be adopted as a

standard fitting on all the diesel locomotives. The main problem with these devices is stated to be the inherent susceptibility of the design to- develop defects too frequently. WABCO Vigilance Control Devices fitted on WDM-2 diesel locomotives on the South-Central Railway have been found to be behaving. erratically in service. The RDSO has informed us that 22 sets of electro-pneumatic type of Vigilance Control Devices supplied by M/s. Beni were put on field trials in 1970 and the performance of these units continues to be unsatisfactory, and several sheds have had to remove them from the locomotives. Efforts are. being made with M/s. Beni to improve these units to a more satisfactory level of service performance. Another ten sets of electrical electronic Vigilance Control Device designed and fabricated by the RDSO were installed on WDM-2 diesel locomotives of Katni shed on the Central Railway during 1970-71. The RDSO has stated that the performance of the first lot of Vigilance-Control Devices fitted on WDM-2 diesel locomotives has not yet been established and that further development of this design is being pursued.

461 In their report for 1976-77, the Commission of Railway Safety had stated that during their inspections, the Vigilance Control Devices in. majority of the cases, were not found to be in working order.

462 Regarding the response of drivers to the Vigilance Control Device,, reports from the Railways are not very encouraging. The

drivers are stated. to feel that these devices distract them from watching signals and they often blank them off during the run. The South-Eastern Railway has stated that the WABCO type of Vigilance Control Device, where the driver has to change the position of the foot-pedal every 40 seconds, has not been favourlably received by the drivers since it involves a const6ilt change of the position of the leg at very frequent intervals. They have added that an alternate design which the driver could operate either by leg or hand is likely to be more acceptable to the driver. In this connection, we have been advised by the RDSO that the Psycho-Technical Cell bad conducted an experimental study in collaboration with the medical department on the question whether operation of Vigilance Control Devices induced fatigue and boredom in diesel drivers. The study revealed that operation of Vigilance Control Devices did not generate fatigue and exhaustion to any significant extent to impair their efficiency.

463 For the provision of Vigilance Control Devices on electric locomotives, the Railways were given directions in November, 1973 to draw up a three year time-bound programme. The Railway Board had advised them that, whereas the indigenous design would be preferred, if necessary certain numbers may be imported to keep up the 'programme. The Railways have informed us that electric locomotives have not been fitted with Vigilance Control Device. We find that no import of Vigilance Control Device for electric locomotives was made, and indigenous development thereof is still in the trial stage. Thus, there has been no progress in the provision of

this safety device on electric locomotives during the last 10 years.

464 In From the foregoing it will be seen that even though the provision of Vigilance Control Device on diesel and electric locomotives had been accepted as a policy by the Railway Board, a decade has elapsed and a satisfactory design of Vigilance Control Device for electric locomotives, suitable for Indian conditions is still to be developed. While some diesel locomotives have been equipped with this safety device, none of the electric locomotive's has been provided with the same. Even where this device has been provided on diesel locomotives, in many cases it is found to be not in working order. Thus, an important safety measure remains substantially unimplemented. We are concerned that it has also, so far, not been possible to get the drivers to accept the utility of this safety device, inspite of the fact that the study made by the RDSO had shown that its operation did not generate fatigue and exhaustion in drivers to any significant extent which is likely to impair efficiency. We would urge the Railway Board to take urgent steps to equip all diesel and electric locomotives with Vigilance Control Device at the earliest possible, if necessary, by resorting to imports till a successful indigenous design becomes available. It is also necessary that full cooperation of the drivers is ensured by better educational 'propaganda and more frequent personal contacts.

465 **Overaged Locomotives:—** (Recommendation 182—Part I, 237—Part II) The Wanchoo Committee felt that in view of the

large proportion of averaged locomotives, coaches and wagons which would have to be kept in use during the Fourth Five-Year Plan, due to smaller allocation of funds, special attention would have to be given to such stock during periodical overhaul as well as during day-to-day maintenance. They felt that periodical overhaul to such stock may have to be given at shorter intervals to keep them road worthy and safe for operation. They urged the Railway Board' to give serious consideration to this matter.

466 The Railway Board have stated that instructions are issued from time to time to the Railways to pay special attention to the maintenance of overaged locomotives irrespective of the gauge or service to which they are assigned; and that their field inspections confirm that the Railways are making proper efforts in this direction. The older locomotives are generally utilized on inferior services, e.g., departmental, pilot, and shunting, where the work is comparatively less demanding. A careful study had revealed that the system of carrying out periodical overhaul of locomotives was adequate and keeping in view the careful attention given to locomotives at each stage of scheduled repair, there was no need for undertaking periodical overhaul of overaged locomotives at shorter intervals.

467 The position in regard to overaged steam locomotives on the broad and meter gauges is given in Annexure XLI. The position in brief is given in Table 51 below: —

TABLE 51

As on	Broad gauge			Meter Gauge		
	Holdings	Number of	%	Holdings	Number of	%

	of stock	overaged		of stock	overaged	
31-3-1964	6700	2084	31.10	3709	792	21.35
31-3-1969	6056	1254	20.71	3593	587	16.34
31-3-1978 (Provisional)	4899	432	8.82	2966	285	9.61

468 It will be seen that there has been a gradual decrease in the holding of steam locomotives due to progressive dieselization and electrification during the last 15 years. In this background and with the steps taken by the Railway Board to give special attention to the maintenance of overaged locomotives, perhaps a reduction in the time interval between two overhauls may not be 'necessary. We will examine this matter further and advert to it in our subsequent report.

GOODS AND COACHING STOCK

469 The last decade has seen considerable increase in the holding and utilization of all types of rolling stock. Between 1968-69 and 1977-78, the number of passenger coaches increased from 23,701 to 26,572 (12 per *cent)* and the total aggregate kilometers run by such vehicles increased by 28 per cent. During the same period the number of wagons increased from 381,852 to 399,971 (4.75 per cent) and the total wagon kilometers went up by 23 per cent. Besides increased intensity of utilization there has also 'been an appreciable change in the types of stock which are being added to the existing fleet. The addition to passenger coaches has been almost entirely in the all-welded integral design. An increasing number of bogie wagons with roller bearings are also being put into operation with each passing year.

470 The Wanchoo Committee made 75 recommendations regarding goods and coaching stock. Out of these, items 192 and 217 of Part II are mere observations and did not call for any action. Item 190 of Part I, 195, 196, 198, 199, 205, 206, 207 to 213, 214(ii), 215, 218, 220, 224, 226, 227, 232, 235 (i) and 236 of Part II had either been implemented or appropriate instructions have been issued by the Railway Board as required in each case. Item 197 of Part II was not accepted by the Railway Board. All the above-mentioned recommendations and observations together with the views/action taken thereon as advised to us by the Rail-'way Board are given 'in the Appendix. Our detailed review of the implementation of the remaining recommendations is contained in the following paragraphs.

471 Time allowed for train examination and strength of train examination gang:—

(Recommendation 183—Part I, 193—Part II)—The Wanchoo Committee noted that contrary to recommendations 141(ii) and (v) in Part II report of the Kunzru Committee, most of the Railways have allowed 'fixed time for train examination on an ad hoc basis rather than on the -basis of any work study or yardstick laid down by the Railway Board. They considered the adoption of a uniform basis for fixing the time schedule for train examination and for determining the strength of examining gangs 'by all the Railways was not only advisable but essential for the proper examination of trains

and urged that any further delay in implementing the Kunzru Committee's recommendation should be avoided.

472 The Railway Board have advised us that the pattern of movement of goods trains, farthing various streams of inter-railway traffic, is subject to continuous change due to industrial, agricultural and commercial developments in the various' parts of the country. The holding of rolling stock with roller bearings is increasing day by day. Engine runs are also being extended due to dieselization and electrification. It is on this account that a periodical review is carried out for determining the requirements of locomotives, rolling stock and the periodicity of their examination on all the Railways. They stated that instructions were issued to the Railways in June 1969 indicating the following time schedule for examination of goods trains consisting of 60-70 wagons (in terms of 4-wheeler units): —

(i) For terminating trains:

(a) 2 hours for intensive examination to rectify all rejectable defects.

(b) 2 hours for intensive examination to rectify rejectable defects and make good deficiencies of penalty and debitable items when offered to neutral control staff for examination.

(ii) For originating trains:

1½ hours for intensive examination to rectify all rejectable defects including testing of vacuum brakes.

(iii) For stations en-route:

½ minute per wagon (excluding time for repairs) for Safe-to-run* examination.

The Railway Board have added that the Railways have been engaged in tailoring the strength of train examining gangs at various major yards to match the number of trains dealt with.

*Safe to run examination covers all defects which have a direct bearing on the safe running of trans.

473 On the basis of the above time schedule for different types of examination, the Railway Board in September, 1971 laid down yardsticks for gang strengths for rejection standard examination and intensive repair of each train as follows:—

(i) Rejection standard examination with intensive repairs of rejectable defects and make good deficiency of penalty and debitable items……. 50 man-hours.

(ii) Rejection standard examination with intensive repairs of rejectable defects…… 40 man-hours

The Railway Board directed the Railways to review the staff strength in each yard on the basis of the above yardstick, workload and time available for rejection standard examination with intensive repairs.

474 The subject of gang strength for examination and repair of goods stock was discussed at the meeting of Chief Mechanical Engineers with the Railway Board in February, 1972 when the Railways were advised that the actual requirement of the gang strength should be assessed after proper work study and based on the workload in each yard. The Railway Board clarified that it was not the intention that the staff strength should be assessed uniformly on the basis of the man-hours indicated in their directive of September 1971. The Railways

were advised that any marginal addition in the number of posts required should be done only on the basis of a proper work study, after taking into account the posts rendered surplus due to elimination of intermediate examination. In October 1972, the Railway Board advised the Railways by way of clarification that the work content on intensive repairs as advised to them under their directive of September 1971 was to be taken only as a broad guideline and no posts should be upgraded on the basis of the composition of gang strength shown therein.

475 In March, 1978, the Railway Board asked the Railways to advise the minimum additional requirements of staff on the basis of the guidelines contained in their directive of September, 1971. We understand that some of the Railways have come forward with considerable requirement of additional staff and a final decision in the matter still remains to be taken. Thus the recommendations made by the Kunzru and the Wanchoo Committees remain unimplemented. This is a vital matter affecting the safety of train 'operations and the Railway Board should take a decision expeditiously and implement the recommendations as early as possible.

476 Adoption of Andal pattern of train examination:--

(Recommendation 194—Part II)—The Wanchoo Committee were of the view that if the Andal pattern of train examination had proved efficient, economical and useful, it should be extended to other important train

examining centers. They suggested that difficulties, if any, in its adoption at other places should be overcome.

477 On The Railway Board had accepted this recommendation and advised us that the Andal pattern of train examination has been introduced in the following yards—

Central	Wadibunder, Vadala, Bhusaval, Itarsi, Jhansi, New Katni, Ajni, Nagpur and Amla.
Eastern	Mughalsarai, Gomoh, Andal and Chitpur.
Northern	Khanalampura, Kanpur GMC.Tugh/akabad and Ghaziabad.
North-Eastern	Garhara, Manduadih, Gonda, Kasganj, Kanpur, Gorakhpur and Chapra.
Northeast-Frontier	Siliguri and New Gauhati.
Southern	Jolarpettai, Tondiarpet, Hospet and Raichur.
South Central	Kazipet, Vijayawada and Wadi.
South-Eastern	Nimpura, Tatana gar, Bondamunda, Bhilai, Mahendragarh, Waltair, Bhojudih, Anara and Adityapur.
Western	Bandra Marshalling Yard, Bajwa, Vadodara. Ujjain, Bandikui, PhuIlera, Hanna, Mehsana, Sabarmati and Gandhidham.

478 In its comments, the Central Railway has stated that the Andal pattern of intensive examination which was being carried out on the receiving yards was not found satisfactory and hence intensive examination was shifted to departure yards. The Northern Railway has stated that it has not been possible to introduce the Andal pattern of train examination since hump shunting of goods loads is done after the incoming examination

and damages occurring during humping have to be detected; further, the reception lines in yards could also not be kept occupied for long to give intensive examination. The North-Eastern Railway has commented that the introduction of Andal pattern of examination would mean heavy expenditure. The Southern Railway has stated that this examination involves deployment of a large number of staff to form repair-wise gangs for train examination and due to restrictions on expenditure as well as creation of posts, the required staff could not be employed to adopt the said pattern. Similar difficulty was also felt on the Northeast Frontier Railway.

479 Thus we find that quite a few Railways experienced difficulties in introducing the Andal pattern of train examination. In view of the problems indicated by the Railways, we shall go into this matter further and: advert to it in the subsequent report.

480 Repair of wagons on nominated lines and on trains in traffic yards: —

(Recommendation 200—Part II) The Wanchoo Committee observed that repairs of goods wagons were carried out on trains, in traffic-yards, in sick-lines and in workshop's and that the scope of maintenance on. trains and in traffic yards had been progressively enlarged in order to avoid wagons being put out of commission. In order to ensure a proper quality of repairs, they suggested that the repairs to be carried out on trains and in traffic yards should be identified, pre-requisites for the proper carrying out of such repairs should be

standardized and availability of pre-requisites. should be ensured.

481 The Railway Board have Stated that the type of repairs to be undertaken at various locations, viz, in sicklines, on nominated lines in traffic yards, and on trains during intensive and safe-to-run repairs, were defined in February, 1971 and also circulated to the Railways. The Railways were asked to stipulate the necessary tools, equipment, and facilities and to ensure their availability. We note that subsequent to the issue of these instructions, the Railways had expressed doubts regarding carrying out of certain types of repairs on nominated lines in traffic yards or on trains due to lack of certain types of facilities and equipment. However, the Railway Board after due consideration of these difficulties had reiterated their earlier instructions emphasizing that facilities, tools, and equipment should be stipulated and provided for the proper execution of the repairs which have been identified for being carried out in traffic yards and on trains.

482 The Railway Board have advised us that tools, equipment and other facilities for undertaking repairs in traffic yards and on trains are largely available. However, in their comments the Railways have given no categorical assurance in this regard. On the other hand the Northern and Western Railways have stated that the facilities to be provided for carrying out repairs in traffic yards have not been standardized. Thus, this recommendation has not been fully implemented on all the Railways so far.

483 In order to assess the standard of repairs of wagons in traffic yards and on trains, we have examined the results of examination of goods stock in yards by Neutral Control Flying Squad as shown in the report of the Indian Railway Conference Association for the year 1976-77. These are given in Annexure XLH. We find that in yards, wagons left over with rejectable defects even after repairs, taken as a percentage of the number of wagons examined, ranged from 12.8 per cent on the South-Central Railway to 71.9 per cent on the Western Railway on broad gauge and from 6.1 per cent on the South-Central Railway to 43.8 per cent on the Central Railway on meter gauge. The said report points out that a substantial proportion of rejectable defects which have direct bearing on safe running of trains and are prefixed `S' in the Conference Rules Part III were noticed on wagons checked in yards both on broad and meter gauges and that the Railways would have to take special action to improve repairs of defects in yards.

484 The results of examination of terminating trains in the marshalling yards, where neutral control staff are posted, for the year 1976-77 are shown in Annexure XLIII. The percentage of wagons with rejectable defects ranged from 10.3 to 24.7 on broad gauge and from 10.5 to 19.2 on meter gauge. Pointing to the high percentage of rejections, the report impressed on the Railways the need for more repairs to wagons on trains. They had also observed that the number of trains offered for examination were less than the target laid down. Thus, the available inspection facilities were not fully made use of.

485 The In the light of the foregoing, we feel that the position of repairs to wagons in traffic yards and on trains is not entirely satisfactory. It is undesirable that wagons with rejectable defects should continue to remain in service though not permitted under the Conference Rules, Part III. We would impress upon the Railway Board to take steps and ensure that repairs to wagons on nominated lines and on trains in traffic yards are carried out satisfactorily. The Committee will go into this matter further and advert to it in the subsequent report.

486 **Sickling— facilities and equipment:—** (Recommendations 201 and 202—Part II)— The Wanchoo Committee observed that the Railway Board had classified carriage and wagon depots and sicklines with respect to the equipment and facilities to be provided therein and standardized the repairs to be carried out in each. Facilities and equipment in each sickline were to be surveyed, taking into consideration the nature and extent of repair to be done and the deficiencies made good. They also expressed the view that the provision of wheel lathes, ultrasonic testing equipment and burnishing machines in the major sicklines would enhance the standard of maintenance of rolling stock.

487 The Railway Board had initially stated that the. equipment for the various classes of sidelines had already been prescribed and the Railways were being advised to ensure that the standards were adhered to. They have now advised us that the provision of equipment standardized in January 1954 is being progressively improved upon to suit the rising holding of eight-wheeler and

other special type of wagons through the annual Works, Machinery and Plant Programmes for each Railway.

488 The Railway Board appointed a Committee in April 1971 to study the equipment of sicklines and to make recommendations in view of the substantial changes in the design of rolling stock as also in the nature of repairs to be carried out in carriage and wagon depots since the equipment was standardized in 1954. After review of the list of items standardized in 1954, this Committee submitted a revised list of equipment. They also observed that there had been major changes in the design and types of rolling stock both for passenger and freight traffic on the Indian Railways since 1954 for which the standard of attention required for maintenance in sicklines was now of a much higher order than what it was in 1954. The recommendations made by this Committee were circulated to the Railways in December 1971 for study and comments but no specific directive appears to have been issued thereafter.

489 The Railways have generally stated that the sicklines are provided with minimum basic facilities required for undertaking different types of repairs and that deficiencies are being made good depending upon the availability of funds. We find that whereas the Northeast Frontier Railway has indicated that the machinery and tools are provided on the basis of the Railway Board's instructions issued in 1954, all the other Railways have stated that the sicklines are being equipped as per revised standards recommended by the Committee in December 1971.

In their replies to the questionnaire, the Railways have indicated the non-availability of certain types of equipment in the sicklines. For instance, the Eastern Railway has indicated

that items like slack adjuster testing bench, direct admission valve testing bench, whitting jack, hydraulic extractor, lister truck or fort lift truck have not been provided; the South-Eastern Railway has said that these have been provided at only a few selected major and central sicklines.

490 The As regard ultrasonic testing equipment, wheel lathes and burnishing machines provision of which in major sicklines was specifically recommended by the Wanchoo Committee, we find that ultrasonic testing equipment is not included in the standard lists of equipment prescribed either in 1954 or in 1971. However, this equipment has been provided in some sicklines by the Central, Eastern, Southern, South Central and Western Railways but not in the others. The comments of Railways show that wheel lathes are provided only in a few carriage and wagon repair depots and in major sicklines. The North-Eastern, South Central and Western Railways have stated that burnishing machines have not been provided in sicklines.

491 The We understand that in September, 1973 the intervals between periodical overhaul of different types of stock was increased by the Railway Board. Thereafter a committee was appointed to go into the question of modernization of sicklines in order to make them suitable for undertaking heavier repairs and to meet the increased workload due to extended POH periods. This Committee submitted their report in 1973, making recommendations for the development and modernization of sicklines with a view to ensuring a better quality of work. The Railway Board, however, decided in March 1976 not to proceed with the scheme of modernization and expansion of

selected sicklines because of the restoring of original POH intervals. We shall go into this matter further and advert to it in the subsequent report.

492 Repairs to wagons at the time of repacking axle boxes in sicklines:— (Recommendation 203(i), (ii)-Part II)—The Wanchoo Committee observed that the stage at which each wagon went for normal axle box repacking was the occasion when the wagon should receive full attention and be turned out in as perfect a condition as possible, with all the defects rectified. They expressed doubts if adequate checks were exercised on the wagons coming out of sicklines after repacking and recommended that checks on the wagons corning out of sicklines after repacking 'should be greatly intensified as the standard of repairs given to the wagons would depend on the measure of inspection and supervision.

493 The Railway Board have stated that this was being followed as a policy. In 1970 they reiterated their earlier instructions, emphasizing that all rejectable defects must be rectified and debitable and penalty defects should also be attended to as far as possible when wagons come to sicklines for half-yearly repacking of axle baxes. It was also pointed out to the Railways that the figures of overage debit per wagon, after repairs were carried out in sicklines, continued to be high which indicated that the repairs were not being carried out to the extent possible. In their comments, the Railways have stated that wagons coming to sicklines for repacking of axil boxes are properly attended to before they are released from

sicklines. Such wagons are subjected to check by neutral control staff, where provided, or by inspectors and officers during their inspections of sicklines.

494 The system of neutral control examination of wagons is in force at 59 broad gauge and 19 meter gauge sicklines where wagons are turned out after obtaining neutral control fit certificates. The results of checks made by the neutral control staff in terms of the number of wagons found with rejectable defects during final examination after attention in sicklines are published by the Indian Railways Conference Association in their annual reports on the Broad Gauge and Meter Gauge Wagon Pool and Neutral Control Examination of Rolling Stock (hereinafter referred to as IRCA Report). These reports show that wagons are allowed to come out from sicklines with rejectable defects in contravention of the Conference Rules, Part III, Observations made by neutral control staff in this regard for the five-year period ending 1976-77 are summarized in Table 52 below—

TABLE 52

Wagons with rejectable defects during final examination by neutral control staff in sickliness.

Year and Gauge	Number of wagons in units checked during initial examination	Number of Wagons with rejectable defects during final examination	Percentage $\frac{(3)}{(2)} X\ 100$
(1)	(2)	(3)	(4)
1968-69(Broad and Meter gauge combined)	7444		2.7
Broad Gauge-			
1972-73	1365	144	10.5

1973-74	1267	33	2.6
1974-75	537	103	19.2
1975-76	1698	83	4.9
1976-77	1780	95	5.3
Meter Gauge-			
1972-73	768	2	0.3
1973-74	695	40	5.8
1974-75	397	87	3.0
1975-76	1141	65	5.7
1976-77	1061	87	8.2

495 It will be seen that during 1976-77, on final examination in sickliness, 5.3 and 8.2 percent of the wagons on broad and meter gauges respectively were found with rejectable defects. It is disquieting that even rejectable defects are not being fully attended to in sickliness.

496 We also see from the IRCA Reports that wagons are being turned out of sicklines without neutral control fit certificates, thus evading neutral control examination. The position for the five-year period ending 1976-77 is summarized in Table 53 below—

TABLE 53

Wagons passed without neutral control examination.

Year	Total number of wagons in units placed for repair in sickliness and which were pre-examined (in thousands)	Wagons passed without neutral control examination (in thousands)	Percentage $\frac{(3)}{(2)} X\ 100$
(1)	**(2)**	**(3)**	**(4)**
Broad Gauge-			
1972-73	849	200	23.6
1973-74	828	189	22.8

1974-75	804	199	24.7
1975-76	873	177	20.3
1976-77	886	145	15.1
Meter Gauge-			
1972-73	194	56	28.7
1973-74	182	58	31.8
1974-75	184	60	32.6
1975-76	169	42	24.9
1976-77	185	46	24.6

The IRCA Report for 1976-77 points out that in 20 sicklines on, broad gauge and 8 on meter gauge, wagons passed without neutral control fit certificates exceeded 20 per cent. Since 1971-72 these reports have also been consistently highlighting the particularly poor performance of sicklines at Rewari, Garhara, Gonda, Lumdiug, Katihar, Siliguri, Tinsukia, New Gauhati, Samastipur and Guntakal and had observed that in these meter gauge sicklines, the repair procedures are generally sub-standard. Thus, even where the system of neutral control examination of wagons is in force, a substantial percentage of wagons is turned out without fit certification by the neutral control staff. This, in our opinion, is a serious matter which the Railway Board should go into and ensure that no wagon is turned out without fit certification by neutral control staff in sicklines where examination by such staff is in force.

497 From the foregoing it is clear that the recommendations of the .Wanchoo Committee have not been implemented in any substantial measure. The Railway Board should take firm steps to see that wagons are turned out after completion of all stipulated repairs.

498 **Examination and maintenance of coaching rakes-** (Recommendation 204(i), (ii)-Part I1)— The Wanchoo Committee strongly urged that energetic steps should be taken to ensure the provision of adequate number of washing and pit lines with necessary facilities so that each rake was properly examined and maintained on the washing or the pit line. They also considered it necessary that there should be timely placement of rakes on the pit lines to facilitate the examination of wheels and undergear.

500 The Railway Board have advised us that every railway reviews annually the necessity of increasing the number of washing lines/pit lines and other facilities according to the increase in workload. The necessary provision is made through the annual works programmes according to the availability of funds. We note that in December 1970, the Railway Board had emphasized the need for thorough examination of wheels and undergear 'of passenger rakes from the point of view of safety. The Railways were advised to take effective steps to ensure timely placement of rakes on pit lines so that train examining staff get adequate time for examination and thorough repairs. The Railways were also advised to check the rake links to ensure that adequate time was available. at either end of the journey for primary and secondary maintenance of the coaches. The Railway Beard have advised us that a review of placement of rakes of long-distance trunk route trains at a major depot of rake maintenance of each railway had shown that, by and large, adequate time was available for maintenance of rakes on pit lines on all the Railways. In their comments the Railways have generally

stated that washing., and pit lines are being provided according to the requirements and whenever the existing facilities are inadequate, they are expanded through the annual works programmes.

501 In the questionnaire of the Committee, the Railways were asked to advise if there are any coaching rakes which are given primary or secondary maintenance on lines with a high-level platform on one side. From the replies of the. Railways we find that on the Eastern, Northern, Northeast Frontier, South Central, South, Eastern and Western Railways the primary and secondary maintenance of some of the passenger rakes is. still being carried out on lines with a high-level platform on one side. The. Northeast-Frontier Railway ha's stated that 51 UP/52 DN (broad gauge) and 33 UP/34 DN (meter gauge) passenger trains are given secondary maintenance at New Bongaigaon and Katihar platforms for want of accommodation in pit lines. On the South-Central Railway eight passenger train rakes are attended to on platform lines mainly due to operational difficulties. On the South-Eastern Railway a few local passenger trains at Adra are given primary maintenance on lines with a high platform on one side.

502 It is not possible to properly examine a rake which is standing on a line with high level platform as there is inadequate space between the platform and the rake to check the undergear. It is also reported that the conditions on some of the platform lines where this work has to be done are extremely insanitary and it is difficult, if not impossible, for the staff to work under such conditions. We are concerned that primary and secondary maintenance of some passenger carrying rakes is still carried

out on lines with high level platform on one side. We strongly feel that the practice of giving primary and secondary maintenance to coaching rakes. on platform lines should stop forthwith and adequate facilities should be created at the stations to undertake the statutory maintenance schedules as specified in the Conference Rules Part IV.

503 Breakage of bearing springs of BOX wagons:—

(Recommendation. 214(i)—Part II)— The Wanchoo Committee observed that a Box wagon with a broken bearing spring was permitted to. proceed at a restricted speed to the next train examining station with the broken spring clamped. They considered that since the effectiveness of the clamps to prevent angular displacement of the broken end of the spring was doubtful and as there was no permissive clause in the Conference Rules Part III for a wagon to run at any speed with a broken spring, appropriate course would be to detach the wagon with a broken spring at the. station where this defect was detected-and to summon the train examining staff for replacement of the spring.

504 Accepting this recommendation the Railway Board issued instructions to the Railways in August 1969 that the practice of clamping and 'securing broken bearing springs on BOX wagons should be discontinued. From the comments furnished by the Railways, we note, however, that on very busy sections of the Eastern Railway, BOX wagons are still permitted to move at a restricted speed with the broken springs clamped and secured, up to the next train examining point or nominated roadside

station. The Northern Railway has stated that the practice of moving a loaded BOX wagon with a broken spring duly clamped still continues mainly on operational considerations. The South-Eastern Railway has informed that, under exceptional circumstances, clamping of broken springs has to be done on loaded BOX wagons to allow them to move at a restricted speed to the next train examining point. On the Western Railway also broken springs on BOX wagons are clamped and the train is worked at a restricted speed up to the nearest train examining depot,

505 From the foregoing, we find that though the Railway Board had issued orders in 1969 that the practice of clamping and securing broken bearing springs on BOX wagons should be discontinued, these orders are not being complied with by the Railways. We would like to examine this matter further.

506 **Overloading of BOX wagons:—** (Recommendation 214(iii)— Part II).— The Wanchoo Committee had been informed that BOX wagons were invariably overloaded, at times to the extent of 12 tonnes per wagon. They stated that it was essential that a satisfactory solution to the problem of overloading of BOX wagons with minerals should be found to reduce the incidence of breakage of springs.

507 It In their remarks, the Railway Board have advised us that overloading of wagons beyond the permissible carrying capacity is not only a safety hazard, but also causes considerable damage to the rolling stock in the form of breakage of springs, etc. They have stated that normally overloading occurs only in the case of

loose' commodities such as coal, iron ore and other minerals etc. and in order to curb the tendency on the part of consignors to overload wagons beyond the prescribed tolerance, the rules in regard to overloading have been made more stringent. For minimizing the incidence of overloading of loose commodities adequate weighment facilities at the 'loading points have been considered essential so that necessary adjustments are made in the loaded wagons before these are' despatched. It has been stated that as a step in this direction and in order to give 'incentive for installing of weighbridges by the major rail-users, such as collieries, Minerals and Metals Trading Corporation, etc. a system of rebate on weighment charges has been introduced by the Railways. Such major rail-users are initiating action to provide their own weighment facilities at their sidings under this system and the Railways are keeping close liaison with the colliery authorities. Weighbridges are also being installed by the Railways at some of the major loading points.

508 It The Additional Commissioner of Railway Safety, Eastern Circle, in one of his inspection reports for 1977-78, had observed that no adjustment was being done in the case of overloaded BOX wagons and the extent of overloading was as much as 50 to 60 per cent of the carrying capacity. He had further remarked that it was not understood under what authority the overloaded BOX wagons were being permitted to run, ignoring safety instructions and urged that this. practice should be given up immediately. He also noted that the weighbridges were going out of order quite often, with the result that the weighment of coal wagons was receiving a setback. The 49th Carriage and Wagon Standards Committee in May 1978, while considering the very high incidence of bearing spring failures on BOX

wagons, stated that investigations had shown that overloading of BOX Wagons was very common and this was the main cause of spring failures. They recommended that urgent measures should be taken to reduce the incidence of overloading of BOX wagons. In reply to our questionnaire, the RDSO have stated that breakage of laminated bearing springs is a common defect which is reported by the Railways and one of the remedial measures suggested is to prevent overloading of the wagons by users.

509 We find that the Director, Mechanical Engineering, Railway Board during his visit to Asansol, Dhanbad and Mughal Sarai in August 1978 had commented on the very serious problem of overloading prevailing at the coal loading depots on the Eastern Railway. The position in regard to Overloading of BOX wagons in some depots as observed during the said visit is given in Annexures XLIV and XLV. The summarized position is given in Table 54 below: —

TABLE 54

Extent of overloading of BOX wagons at coal loading depots

Depot	Month	Wagons found over-loaded as a percentage of total numbered of wagons weighed	Maximum quantity of overload (tonnes)
Pathardih	May 1978	65.0	16.4
	May 1978	71.7	15.7
Kusunda	May 1978	66.0	17.3
	June 1978	66.1	13.3
Katrasgarh	May 1978	47.6	13.1
	June 1978	50.7	14.0
Andal	May 1978	64.5	16.8

	June 1978	43.6	14.7

Large-scale overloading of BOX wagons was seen, with overload of to 10 tonnes being a common feature. At Pathardih depot, the overload in. BOX wagons was as high as 16 tonnes, excluding 2 tonnes overload which had been permitted. Thus, the actuial overload over the marked carrying capacity was 18 tonnes, in the above case. The problem of overloading was. stated to have become particularly acute since the minimum weight for freight was fixed at carrying capacity plus 2 tonnes. The Director, Mechanical Engineering had remarked that damage to wagons, track and accidents. due to breakage of springs was a very serious matter and that deterrent punishment in the case of defaulting collieries, was called for. Arising out of the above inspection report, in November 1978 the Railway Board drew the attention of the Railways to the growing incidence of overloading of wagons in respect of coal, ores, stones and various other commodities at different loading points. The Railways were asked to observe the extant instructions aimed at reducing the incidence of overloading of wagons.

510 From the foregoing,' we find that large-scale overloading of BOX Wagons, up to the extent of 8 to 10 tonnes, is a common feature at certain coal loading depots on the Eastern. Railway. In some cases, the overloading was as high as 18 tonnes. It appears to us that this cannot happen except with the connivance on the part of some personnel on the Railways and the loading parties. Thus, the dangerous practice of overloading of BOX wagons not only continues unabated but has aggravated in the last decade.

In view of tit& seriousness of the problem of overloading of wagons and its importance from the safety aspect we have also reviewed the various. measures taken by the Railway Board so far.

511 We find that in terms of the Railway Board's instructions of June-1964, no of BOX type wagons was permitted except for a loading tolerance up to 2 tonnes to cover errors in loading. Considering the high incidence of failures of springs of BOX wagons and welds on bogie. frames, the 43rd Carriage and Wagons Standard Committee in September 1966 strongly recommended that effective steps should be taken to stop. the overloading of BOX wagons. In March 1978 it was decided that all BOX wagons which are overloaded beyond the marked carrying capacity plus 2 tonnes loading tolerance should be damage-labelled and detached from the train for adjustment of loads. At this stage the Eastern Railway represented that due to operational difficulties and heavy detentions involved. in case overloaded BOX wagons were detached from the rakes for adjustment, it had not been possible to check overloading. However, the Railway Board in July, 1.971 reiterated their earlier instructions pointing out that there was no alternative but to undertake adjustment by unloading the excess contents of the overloaded wagons. • The Railways were advised that this adjustment could conveniently be carried out when BOX rakes, after weighment, wait for a considerable time in the yard or on the outgoing lines. The Railway Board desired that necessary adjustments should be made so that no BOX wagons with excess load was despatched from the booking station.

512 In October, 1974, the Railway Board decided to amend Rule 161 of the IRCA Goods Tariff No. 34 Part I regarding penalty for loading beyond carrying capacity. With effect from 1st December 1974 overweight of 1 tonne or less above the permissible carrying capacity of a four/six wheeled wagon, and 2 tonnes or less in a eight-wheeled wagon was to be charged at the small rate applicable to the same commodity for the distance such overweight was carried. In case the overweight exceeded the limit mentioned above, the entire overweight was to be charged at double the highest-class rate (class 150) for the distance such overweight was carried. The purpose of this amendment was to effectively discourage consignors from deliberately overloading wagons.

513 We note that in September, 1975 and January, 1976, the Railway Board issued notifications in exercise of the powers conferred by sub-section (1) and sub-section (4) of section 53 of the Indian Railways Act, 1890 (9 of 1890), fixing the maximum carrying capacity for the various classes of wagons. Accordingly, a four/six-wheeled wagon was permitted to be overloaded to the extent of two tonnes inclusive of the loading tolerance of one tonne. Eight wheeled wagons of the type BOX, BOI, BRS, BRH, BCX, BOPX and BOBS could be overloaded to the extent that the total weight of the consignment including the loading tolerance did not exceed the marked carrying capacity by two tonnes. Consequent to this notification, it was decided that for commodities for which the notified minimum weight condition is the carrying capacity, the minimum weight for charge for such commodities loaded in BOX, BOT, BRS, BRH, BOX, BOBS and BOBX wagons would be the marked carrying

capacity plus two tonnes. This took effect from 15th November 1975. Instructions were also issued to the Railways in December 1975 to mark revised load lines for various commodities with respect to the revised minimum weight for charge i.e., carrying capacity plus two tonnes, so that trade may be able to load the wagons to the extent of the revised capacity.

514 We thus find that the loading tolerance of 2 tonnes over the carrying capacity of BOX and similar other types of wagons which had been per-milted to take care of errors in loading was absorbed in the rated carrying capacity of the wagon. Thus, overloading of 2 tonnes was permitted as a rule rather than an exception. In so increasing the carrying capacity of BOX type wagons we find that neither the RDSO nor the Carriage and Wagons Standards Committee or the Commission of Railway Safety were consulted.

515 We note that in June 1976, the RDSO took objection to the aforesaid action of the Railway Board in absorbing the loading tolerance in the rated carrying capacity. They pointed out that increase in the carrying capacity amounted to the axle load of such bogie wagon stock being increased by 0.5 tonnes from. the existing 20.3 to 20.8 tonnes in all cases, except BOBX and BOBS where the axle load is already 22.68 tonnes. They opined that the loading tolerance had been provided to avoid the necessity of making unnecessary adjustment in load where the excess beyond the marked carrying capacity was marginal. Such tolerance was meant to be utilized in stray and exceptional cases and it was never the intention that overloading to the extent of one tonne per broad gauge four-wheeler and two tonnes per broad gauge bogie wagon should continue as a

permanent measure by becoming part and parcel of the rated carrying capacity of the wagon. The RDSO also pointed out that the practice of overloading wagons beyond design limits was detrimental to both wagon running gear and the sub-structure, i.e., track and bridges. Repercussions of overloading on wagons include higher incidence of hot boxes on plain bearing stock, premature bearing failures on stock fitted with roller bearings and failure of bearing springs and other elements of the wagon suspension system due to over-stress. Any overloading, whether due to permissible; overload or loading tolerance was an encroachment on the normal margin of safety in design and the notification permitting overload of 2 tonnes as a regular measure would; amount to placing a stamp of approval on this encroachment as a permanent measure. They. noted that this would help encourage consignees to resort to still greater overloading as the carrying capacity plus the permissible overload would, in effect, become the minimum load and the next step would be to allow further practical loading tolerance bn this new minimum load. The RDSO, therefore, suggested to the Railway Board that the notification 'permitting overloading to the extent of two tonnes as a regular measure and as a part of the rated carrying capacity of the wagon should be reviewed and the Railways should go back to the practice of -marked carrying capacity plus loading tolerance to meet operational needs. They also suggested that ways and means should be devised to enforce discipline in regard to overloading.

516 We In their annual report for 1976-77, the Commission of Railway Safety had also observed that Railway Board's instructions of December, 1975, permitting overloading of wagons had neither

been sent to the Commission of Railway `Safety nor were the RDSO informed of the same. They agreed with the views of the RDSO that the practice of overloading wagons beyond design limits was detrimental to the wagon running gear as also to the track sub-structure. They also stated that the South-Eastern Railway had gone a step further and issued instructions to certain stations that no Load adjustment should be done even if overloading is detected at weighbridges.

517 It is a serious matter that in spite of the strong objections by the RDSO and the Commission of Railway Safety, the practice of overloading BOX wagons as a regular measure to the extent of 2 tonnes over and above the carrying capacity has been allowed to continue. Further, higher axle loads on BOX wagons are being permitted in contravention of the Conference Rules Part III. It is even more serious that this rule is flouted day in and day out, by permitting overloading sometimes to be extent of .18 tonnes.

518 We are of the view that the Railway Board's directive permitting overloading beyond the carrying capacity by 2 tonnes, as a regular measure, would seriously affect safety and feel that this needs to be reviewed urgently at the highest level in consultation with the RDSO and the Commission of Railway Safety. We will go into this matter further in our subsequent report.

519 **Incidence of Hot Boxes:—** (Recommendation and Observations 185, 186—Part I)— The Wanchoo Committee had stated that the incidence, of hot boxes on coaching stock on both the gauges over the last three years was a pointer to the need for effective implementation of the recommendations of

the Director, Research (Hot Boxes) and a further critical study, if necessary. They noted a marked improvement in the incidence of hot boxes on goods stock.

520 We Incidence of hot boxes on Coaching stock:—The Railway Board have stated that the, incidence of coaching hot boxes on meter gauge has shown a downward trend, the number of hot boxes per 10 million vehicle kilometers having come down from 4.28 in 1975-76 to 2.22 in 1976-77. 'The recommendations of Director, Research (Hot Boxes), are being hallowed by the Railways.

521 The incidence of hot boxes on coaching stock on the various Railw4s during the years 1973-74 to 1977-78 is shown in Annexure XLVI. Figures for the period 1963-64 to 1967-68 have been juxtaposed for comparison. The overall position on the Indian Railways is summarized in 'Noble 55 below: —

TABLE 55

Incidence of hot boxes on coaching stock

Year	Incidence of hot boxes on coaching stock per 10 million vehicle kilometers	
	Broad Gauge	Meter Gauge
1967-68	1.24	6.41
1973-74	0.71	4.03
1974-75	0.82	4.29
1975-76	0.53	4.29
1976-77	0.52	2.23
1977-78	0.43	1.94

522 It will be seen that in the case of coaching stock on both the broad and meter gauges, after a rise in the incidence of hot boxes during 1974-75 and 1975-76, there has been a steady fall in the last two years of our survey. During 1977-78 the all-Railways incidence of hot boxes on coaching stock per 10 million vehicle kilometers was 0.43 on broad gauge and 1.94 on meter gauge as against the Railway Board's target of 1.0 oft both gauges. Taking the Railways individually, we find from Annexure XLVI that on the broad gauge of the Northern, South Central and South, Eastern Railways there has been an increase in the incidence of hot boxes on coaching stock during 1977-78 as compared to the previous year. On the meter gauge, we find that none of the Railways were able to achieve the target of the Railway Board during 1977-78; on the other hand, the incidence of hot boxes had gone up on the Southern, South Central and Western' Railways as compared to the position obtaining in the 'previous year. We would urge these Railways to take necessary steps so as to bring down the 'incidence of hot boxes.

523 The incidence of hot boxes on Goods Stock:— The incidence of hot boxes on goods stock on the various Railways during the years 1973-74 to 1977-78 is shown in Annexure XLVII. The position obtaining during the years 1963-64 to 1967-68 is juxtaposed for comparison. The overall incidence of hot boxes on the Indian Railways is summarized in Table 56 below: —

TABLE 56

Year	Incidence of hot boxes on goods stock per million wagons, kilometers	
	Broad Gauge	Meter Gauge

1967-68	3.7	1.5
1973-74	4.30	1.09
1974-75	3.86	1.31
1975-76	3.36	1.46
1976-77	2.58	1.06
1977-78	2.75	0.93

524 It will be observed that the overall incidence of hot boxes on goods stock on broad gauge has been steadily falling except during 1977-78 when there was a slight increase as compared to the previous year. On the meter gauge also, there has been a decline in the incidence of hot boxes on goods stock except for two intervening years 1974-75 and 1975-76 when there was an increase,

525 Taken individually, all the Railways on the broad gauge were . able to keep within target the incidence of hot boxes per million wagon kilometers laid down by the Railway Board. However, during 1977-78 there was an increase in the incidence of hot boxes per million wagon kilometers on broad gauge goods stock on the Eastern, Northern, Southern, South Central, South-Eastern and Western Railways. These Railways should take effective steps to reverse the trend and bring down the incidence of hot boxes. On the meter gauge, except for Southern and South-Central Railways, no other railway could keep within the target* of 0.5 hot boxes per million wagon kilometers stipulated by the Railway Board. The North, North-Eastern, Northeast Frontier and Western Railways should take effective steps to bring down the incidence of hot boxes on meter gauge goods stock within the target stipulated by the Railway Board.

*Targets for hot boxes on Goods Stock laid down by the Railway

Board:			
1	Broad Gauge:		
a	Eastern and South-Eastern Railways	5.0	Per million wagon kilometers.
b	Central, Northern, North-Eastern, Northeast Frontier, Southern, south Central and Western Railways	2.5	DO
2	Meter Gauge	0.5	DO

526 From the information furnished by the Railways, we have also surveyed the causes of hot boxes on coaching and goods stock during 1973-74. As was observed by the Kunzru and Wanchoo Committees, the principal causes of hot boxes on coaching and goods stock on both broad and meter gauges continue to be dry 'packing', badly fitted brasses., uneven loading or overloading, water or dirt contaminated packing, badly metalled brass, etc. These areas of maintenance of rolling stock, therefore, call for greater attention.

527 Here we may point out that due to the increasing number of coaches, and wagons fitted with. roller bearings which are being put into service, on the Railways, the overall incidence of hot boxes in relation to vehicle/wagon kilometers is bound to come down. We would, therefore, caution the Railways against complacency in this regard and urge that steps should continue for bringing down further the incidence of hot boxes on coaching stock and wagons on both broad and meter gauges. Also, the targets may need to be appropriately revised.

528 Hot Box Detector:—

(Recommendation 216—Part II) — The Wanchoo Committee recommended research and study to develop a hot box detector for use on Indian Railways.

529 The Railway Board have stated that two sets of hot box detectors have been imported and installed near Mughalsarai and Dhanbad for field. trials. Based on the experience gathered from this trial installation, M/s. Bharat Electronics Limited, Ghaziabad, have been asked to develop an indigenous system to meet the specification's which have already been framed by the RDSO. We are sorry to note that though more than a decade has elapsed, an indigenously developed hot box detector appears nowhere in sight. With the trend towards long-distance and high-speed trains the need for detecting hot boxes in time cannot be over-emphasized.

530 Brake Power:—

(Recommendation 219(i) to (iv) Part II)— The Wanchoo Committee expressed the view that the directives in regard to the prescribed 'percentage of effective vacuum cylinders, on trains must be observed uniformly on all the Railways. They considered it essential that the requisite brake power should be available on all trains and difficulties arising either on account of defective material or other factors should be overcome. The number of effective cylinders on a train must be a special point of check by the Neutral Control Examiner. They considered it of great importance that the staff why are actually to operate the trains should blow the real position in regard to that brake power available on the train.

531 The Railway Board have advised us that a rule has been incorporated in Conference Rules Part III that 85 per cent and 80 per cent effective vacuum brake cylinders must be ensured on the broad and meter gauges goods trains respectively, subject to the observance of higher percentage to be prescribed, by the Railways for particular sections. Steps have been taken to overcome difficulties due to defective material or other factors. They have stated that the neutral control staff, in addition to checks on trains in certain marshalling yards, also conduct special checks on vacuum brakes over the Indian Railways. At New Gauhati and Gorakhpur yards, one batch of neutral control train examining staff has been posted to conduct regular checks on brake power on trains in CTC section. We note that in May 1969 the Railway Board had issued instructions to the Railways reiterating that no broad-gauge goods train should leave the originating point with less than 85 per cent effective vacuum cylinders. These instructions were made mandatory' with effect from July 1, 1969. The Railway Board have also informed us that vacuum brake certificates indicating the percentage of effective vacuum brake cylinders on trains are issued to drivers and guards on all the Railways. Drivers and guards sign these certificates in acknowledgement.

532 In their comments as well as replies to the questionnaire, the Railways have stated that requisite brake power is provided on all trains. The North Railway has stated that against the prescribed 85 and 80 per cent effective brake power on broad and meter gauge trains, they are providing 75 to 85 per cent effective brake power on broad gauge and 70 to 80 per cent effective brake power on meter gauge. They have indicated that vacuum brake

certificates showing the number of effective vacuum cylinders and the vacuum on the gauges in the engine and in the rear brakevan are issued to guards and drivers. The North-Eastern, Northeast Frontier, Southern, South Central and Western Railways have stated that they ensure 85 per cent effective brake power on the meter gauge trains also as against the stipulated 80 per cent.

533 We have scrutinized the reports of the neutral control staff on the checks regarding effective brake power of originating, through and terminating goods trains in certain selected yards on broad gauge which were made by them on the instructions of the Railway Board during March 1973, June, 1974 and February 1975. The results of these special checks are given in Annexures XLVIII, XLIX & L. The summarized position is given in Tables 57 & 58 below: —

TABLE 57
Effective brake power on originating trains

Percentage of effective power (Range)	Number of Trains Date of Check			Total (2)+(3) +(4)	Percentage $\frac{(5)X100}{Total\ No.of\ trains}$
	March 1973	June 1974	February 1975		
(1)	(2)	(3)	(4)	(5)	(6)
23 to 44.9	4	..	4	8	2
45 to 54.9	23	1	17	41	11
55 to 64.9	40	3	18	81	21.5
65 to 74.9	42	14	65	121	32
75 to 84.9	18	14	49	81	21.5
85 and above	10	3	32	45	12
Total number of trains checked	137	35	205	377	100

TABLE 58
Effective brake power on termination trains

Percentage of effective power (Range)	Number of Trains Date of Check			Total (2)+(3)+ (4)	Percentage $\frac{(5)X100}{Total\ No.of\ trains}$
	March 1973	June 1974	February 1975		
(1)	(2)	(3)	(4)	(5)	(6)
23 to 44.9	10	1	8	19	5
45 to 54.9	32	6	23	61	16
55 to 64.9	49	17	59	125	32.5
65 to 74.9	45	24	75	144	37.5
75 to 84.9	11	4	16	31	8
85 and above	3	1	--	4	1
Total number of trains checked	150	53	181	384	100

534 It will be seen that out of 377 originating 'trains checked, the requisite brake power of 85 per cent and above was available in the case of only 45 trains or 12 per cent of the total and in the case of terminating trains only 4 out of 384 or 1 per cent of the trains had effective brake power of 85 per cent and above. Checks were also made on through trains at Mughalsarai when the effective brake power was found to range between 57.7 and 78.8 per cent and in the case of those checked at Kanpur (GMC) the effective brake power varied from 45 to 65 per cent. The checks at Mughalsarai and Kanpur in June 1974 also revealed that the percentage of effective brake power on box rakes was generally lower than that on mixed and conventional loads.

535 In order to know the position obtaining on the Railways we had asked for certain checks to be conducted by neutral control flying squads On the provision of effective brake power on goods trains. The results of these checks, which were conducted during September 1978, are shown in Annexure LI. It will be seen that

except in case of Bhusaval yard of the Central Railway, no goods train left from any other yard with stipulated brake power of 85 per cent. The effective brake power on originating goods trains ranged between 64 to 89.3 per cent and of terminating goods trains from 56.0 to 80.2 per cent. We also note that the Additional Commissioners of Railway Safety have, on a number of occasions during their inspections, adversely commented upon the brake power of goods trains being less than the prescribed limit. They have also drawn the attention of Railway Administrations to complaints by drivers of goods trains in regard to the inadequacy of brake power.

536 From the foregoing, we cannot escape the conclusion that most of the trains leave originating points with effective rake power much less than the prescribed minimum and the position becomes worse on the run. These results belie the claims made by most of the Zonal Railways that the prescribed brake power is available on all goods trains. The Railway Board's own directive in this regard is thus not being followed and the recommendation of the Wanchoo Committee remains unimplemented. The safety of a train is endangered when its brake power is poor and it must be ensured that trains leave the originating points with atleast the minimum stipulated effective brake power.

537 We also note that whereas the minimum effective brake power at originating point has been laid down, nothing has been prescribed in respect of the effective brake power which should be available while the train is on the run. In reply to the questionnaire of the Committee, the Railways have given varying estimates of a drop in effective brake power while the train is on the run. The

figures vary from 3 to 16 per cent. The South-Eastern Railway has stated that the brake power percentage falls down by 10 to 12 per cent over a run of 500-800 kilometers and the drivers have been given instructions to continue to operate the trains if the brake power remains above 70 percent during the run. However, this is a question which we will examine further and advert to it in our subsequent report.

538 Vacuum certificates are issued to drivers and guards showing the amount of vacuum in the engine and the rear brakevan. The cheeks exercised by the neutral control flying squads at our instance show that the guards of some good's trains do not fix the vacuum gauges in the brake vans. This aspect has also been adversely commented upon by the Additional Commissioners of Railway Safety several times in their accident enquiry reports as well as inspection notes. These comments 'show that such cases are not infrequent. We note that the Railway Board had stressed upon the Railways the absence of vacuum gauges in the brake vans was a serious matter and that effective steps should be taken to ensure that such lapses are not allowed to take place even in isolated cases.

539 The Additional Commissioners of Railway Safety have also pointed out in some of their accident enquiry reports that the brake power certificates issued by the train examiners were not in order. In a number of cases the trains were started without recording on the certificate, the vacuum available in the engine or the brake van. In some cases, fictitious readings of vacuum on the brake van are recorded.

540 We consider the absence of vacuum gauges in the rear brake vans and incorrect preparation of brake power certificates, to be highly disconcerting features. In the absence of a vacuum gauge in the rear brake van or when the brake power certificate is not correct in all respects, the guard will not be aware of the brake power on the train. We would, therefore, stress that effective measures should be taken to ensure that the vacuum gauges are invariable fixed in the rear brake vans and that they are in working order and the brake power certificates are correctly prepared.

541 Diesel hauled goods trains:— (Recommendation 221 Part II)— 'The Wanchoo Committee hoped that a satisfactory solution would be evolved to overcome, the difficulty of stopping diesel hauled goods trains as the application of the vacuum brake in the brakevan gives little or no indication to the driver.

542 In their remarks the Railway Board had stated that detailed tests have since been carried out by RDSO in which it had been observed that the indications received on the gauge in the driver's cab of a diesel locomotive hauling a goods or passenger train, was sufficient to serve as an indication to the driver and that no modification was required in the brake circuitry of the locomotives. The Railway Board, therefore, felt that this recommendation did not call for any further action.

543 The problem of noticing even a small drop in vacuum due to application of brakes at the rear of the train had first attracted the attention of the RDSO in 1966. Because of more powerful exhausters fitted

on diesel locomotives the drop in vacuum on the locomotive vacuum gauge during train-parting or application of guard's van valve was comparatively tower that on steam locomotives. The RDSO, in consultation with M/s. Wasting house Air Brake Company, U.S.A., the suppliers of 28-LV-I breake equipment installed on diesel electric locomotives on the Indian Railways, had envisaged checking the extra exhauster capacity by interposing an additional VA-1 release valve with a maintaining choke in the pipe near the exhauster suction, with a view to improving the indication available to the driver during train parting or application of brakes at the rear of the train. The RDSO had asked the Railways in 1967 to conduct trials by fitting the above arrangement on WDM-2 diesel locomotives and to study their effect on the release timings as also capacity of the modified system to take care of normal leakage on the run.

544 In October, 1971 the RDSO advised the Railway Board that from the results of tests conducted by the South-Eastern Railway it had been observed that even without the provision of additional release valve, the vacuum drop on the locomotive when the vacuum was destroyed in the brakevan was 7 inches. They considered this vacuum drop adequate for an indication to the driver that the brakes had been applied at the rear of the train. They also opined that in actual operation, even before the driver notices any drop in the vacuum gauge and thus becomes conscious of the fact that brakes have been applied or the train had parted, a positive drag on the movement of the train is also experienced; the load meter needle in the locomotive cab also records a sharp jump upwards thereby indicating positively to the driver that brake application of the train had taken place

either due to guard's action in the brakevan or automatically as a result of train-parting. The RDSO also indicated that with the fitting of additional release valve with maintaining choke in the brake circuitry of WDM-2 diesel electric locomotive, the vacuum drop increased to 10½ but the vacuum recreation time also increased, which was not considered desirable since it would result in slower release of vacuum brakes with adverse repercussions on train speeds. This was also confirmed by tests conducted on the Southern Railway. The RDSO, therefore, did not see any need for an additional release valve in the brake circuitry. However, the Railway Board asked the RDSO to carry out tests in the brake research laboratory with a view to determining the optimum choke size in the release valve in order to improve the indication of brake application, particularly at the front end of trains operated with diesel locomotives. RDSO were also asked to conduct tests to determine the size of release valve opening of coaching stock whisk would give an adequate indication to the driver of the alarm chain having been pulled, specially in the front part of a train worked by a diesel locomotive.

545 Detailed tests in this regard were conducted by the RDSO in the laboratory and on goods and passenger trains on the Western Railway with and without the modified brake circuitry of WDM-2 diesel locomotive. In the report made available in 1973, the RDSO, inter alia, give the following conclusions: —

(i) during train parting/guard's van valve operation from the last vehicle of a 70-four-wheeler unit goods train, the vacuum drop on the locomotive vacuum gauge was observed to be 90-138 mm at the end of 60 seconds. This was considered adequate to put the

engine crew on the alert for taking further necessary action. With an additional VA-1 release valve in the circuit, the vacuum drop increased to about 120-220 mm.

(ii) during alarm chain pulling on a 16-coach passenger train without Direct Admission valve, the vacuum drop on the locomotive gauge was observed to be 145-155 mm at the end of 60 seconds. This was considered adequate to put the engine crew on the alert for taking further necessary action, on trains equipped with Direct Admission valve, the vacuum drop was much higher, being about 210-215 mm. With the additional VA-1 release valve in the brake circuit, the vacuum drop on a 16 coach 'passenger train without Direct Admission valves increased to about 165-190 mm at the end of 60 seconds; and

(iii) introduction of an additional VA-1 release valve had affected the vacuum creating/maintainability of the diesel locomotive. The average stable vacuum level was lowered by about 75-90 mm/2025 mm in the case of goods and passenger trains respectively, thus resulting in loss of brake power.

546 After consideration of the above report, the Railway Board draw the attention of the RDSO to two cases of train partings in which the driver of the diesel locomotive had not become aware that the train had physically parted; in one of these cases the brakevan had been left in mid-section and it was only the vigilance of the Assistant Station Master at the next station, who observed that the tail lamp was not visible, that action was taken to stop the

train. The Railway Board also mentioned that checks had revealed that after the first 28 vehicles, even if the vacuum hose pipe got disconnected, the vacuum gradient to engine was such as to give no real indication to the driver. The RDSO were, therefore, asked to recheck these aspects and confirm that the conclusions arrived at in their earlier report were valid under all circumstances.

547 Thereafter further checks were made by the RDSO on six goods trains hauled by WDM 2 diesel locomotives in Lucknow yard. The Railway Board were advised that during these checks it had been observed that even though the indications of vacuum drop in the locomotive vacuum gauge were smaller with lower level of initial vacuum, particularly when train parting occurs between 54th and the last wagon, they are still large enough to draw the attention of the driver. The RDSO, therefore, did not consider it necessary to modify their conclusions. The Railway Board accepted this stand.

548 The repeated results of the trials conducted by the RDSO are, however, at variance with the reported experience of train operating staff and we would like to examine this matter further before coming to any definite conclusion.

549 Marshalling of anti-telescopic coaches on Passenger trains: (Recommendation 222—Part II)— The Wanchoo Committee noted that instructions had been issued by the Railway Board in regard to the marshalling of anti-telescopic coaches at either end of a passenger train to afford

maximum protection to passengers in the event of collision. It had come up in evidence before them that the operating staff find it difficult to identify an anti-telescopic coach from other steel-bodied coaches. They suggested that an identifying mark or code should be inscribed on all anti-telescopic coaches for the guidance of the operating staff so that in the event of stock of both types being available, the staff should marshall anti-telescopic coaches at the ends in preference to other steel-bodied coaches.

550 The Railway Board accepted this recommendation and have advised that anti-telescopic coaches have been given identification marks.

551 In this regard we note that consequent to the collision between 66 Down Dehra Dun-Varanasi Express with stationary M-5 Goods train at Katghar station on the Northern Railway on 21-2-1974 in which there were heavy casualties in a steel-bodied coach which was placed next to the engine, the Commissioner of Railway Safety had suggested to the Railway Board that the marshalling of steel-bodied coaches next to the engine or the rearmost vehicle on a train should be banned and the extant instructions which permitted steel-bodied coaches in these positions should be revised. In April 1975, the Railway Board issued instructions that only anti-telescopic coaches should be used wherever in the earlier instructions they had permitted steel-bodied coaches. However, in subsequent instructions issued in June 1977, the Railway Board stated that for all practical purposes, so far as the protection to passengers in a collision/accident was concerned, the behaviour of rivetted design of steel coach (hereinafter referred to as steel-bodied

coach) may be taken as similar to that of all-steel, all-welded integral coach (referred to as anti-telescopic coach). As a result of this directive, steel-bodied coaches were placed on par with anti-telescopic coaches for marshalling on passenger trains. This meant a reversal of the instructions issued by the Railway Board in April 1975. We have called for further information from the Railway Board and shall advert to it in the subsequent report.

552 We also find that Additional Commissioners of Railway Safety have, time and again, commented on the wrong marshalling of coaches of passenger trains in various accident enquiry reports. It would appear that even the extant instructions on marshalling of passenger trains are not always followed. The Railway Board should ensure that passenger trains are run with the stipulated marshalling order of coaches.

553 **Brakevans:—** Recommendation 223(i) & (ii)—Part II— The Wanchoo Committee suggested that the spring suspension system of broad gauge four-wheeler brakevans should be redesigned to provide, more corn- fordable riding at speeds of 75 kmph and above, and the spring suspension arrangement of meter gauge four-wheeled brakevans should be investigated with a view to improving their riding.

554 It The Railway Board have advised us that a number of brakevans on broad and meter gauges have been fitted with modified springs and the remaining brakevans are also being modified. We note that instructions in regard to the modification of suspension arrangement of broad-gauge four-wheeler brakevans were

issued in August 1970 and of meter gauge in April 1968 and on the basis of the periodicity stipulated for POH, all brakevans on both the gauges should have undergone POH and been equipped with modified spring arrangements by now. This, however, has not been done. We understand that only a prototype of a new design developed by the RDSO has been manufactured and is being put to trial.

555 Periodical, overhauling, of rolling stock:— (Recommendation 187— Part 1, 225 (i), (ii)—Part I1)—The Wanchoo Committee, observed that there was an overall reduction in the number of coaches and, wagons overdue periodical overhaul on Indian Railways as compared to the position obtaining on 31-3-1963. They urged that efforts to reduce still further the number of coaches and wagons overdue periodical overhaul should be continued. However, they noted that on the meter gauge the position was unsatisfactory on. North-Eastern and Northeast Frontier Railways which had nearly 24 and 18 per cent respectively of their holdings of coaches' overdue periodical overhaul. They also found that about 17 per cent of the wagons were overdue periodical overhaul on Western Railway as on 31-12-1968 and that there was need to bring this percentage down. They emphasized the need for regulation of flow of coaches for periodical overhaul into the workshops on Central Railway since about 25 per cent of the coaching stock of that railway was reported to be overdue periodical overhaul.

556 The Railway Board in their remarks have stated that the percentage of stock overdue periodical overhaul (POH) has been reduced as

shown in Table 59 below:—

TABLE 59

Position of rolling stock overdue POH

Type of Rolling Stock	Gauge	Percentage overdue POH-Position as on	
		31-3-1968	30-4-1978
Coaches	**BG**	15	13.9
	MG	14	6.2
Wagons	**BG**	9	9.3
	MG	10	8.0

557 POH of coaching vehicles:- From the records maintained in Railway Board's office the position in respect of overdue POH of coaching vehicles on Indian Railways on the broad and meter gauges is as given in Annexures LII and LIII. The comparative position as obtaining at the time of the Kunzru committee and the Wanchoo Committee vis-à-vis the present position is summarized in Table 60 below: -

TABLE 60

Comparative position of all types of coaching vehicles overdue POH

Position as on	Gauge	Total holding of coaches	Number of coaches overdue POH	Percentage $\frac{4}{3}X$ 100
(1)	**(2)**	**(3)**	**(4)**	**(5)**
31-3-1963	BG	28563	3908	14
(As found by the Kunzru Committee)	MG	22556	3463	15
31-3-1968	BG	18296	2709	15
(AS found by the Wanchoo Committee)	MG	16249	2272	14
31-3-1978	BG	36754	5090	13.85
	MG	25105	1567	6.24

31-10-1978	BG	37248	4962	13.32
	MG	25147	1326	5.27

It will be seen that the improvement in the percentage of coaches overdue POH is only marginal on the broad gauge while it is substantial on the meter gauge.

558 It The detailed position of overdue P011 coaching vehicles on the individual Railways for the broad and meter gauges is given in Annexures, LIV and LV. The summarized position is given in Table 61: -

TABLE 61

Railway-wise position of coaching vehicles overdue POH

Railways	**Coaching vehicles overdue POH as on 31-10-1978 as a percentage of the total holding**			
	Broad Guage		**Meter Gauge**	
	Passenger carrying vehicles	**Other coaching vehicles**	**Passenger carrying vehicles**	**Other coaching vehicles**
All-Railways Avsage	11.44	23.80	4.27	9.26
Central	9.9	21.8	N.A.	N.A.
Eastern	14.5	23.3	No Meter Gauge	
Northern	9.91	26.0	5.37	12.0
North-Eastern	Nil	Nil	3.26	9.36
Northeast Frontier	4.0	9.1	1.40	4.30
Southern	12.6	16.2	6.25	14.70
South Central	13.25	29.8	5.66	13.50
South-Eastern	12.5	18.1	No Meter Gauge	
Western	8.4	20.4	4.5	7.0

559 It will be seen that on broad gauge the backlog of POH was comparatively on the Eastern, Northern, Southern, South Central and South-Eastern Railways. On the meter gauge, the backlog of POH on the Northern, Southern and South--Central Railways was considerably higher than the all-Railways average. The South-Central Railway, which had the highest backlog in POH on both the broad and meter gauges, has advised us that the position can be improved provided adequate number of spare coaches are made available.

560 **POH of wagons:—** The position of wagons overdue POH during the last three years as obtained from the records maintained in the Railway Board's office is given in Annexure LVII. In comparison to the position obtaining at the time of .the Kunzru and Wanchoo Committees, the present position both on the broad and meter gauges is summarized in Table 62 below:—

TABLE 62

Comparative position of wagons overdue POH

Position as on	Gauge	Total holding of wagons	Number of wagons overdue POH	Percentage $\frac{(4)}{(3)} X\ 100$
(1)	(2)	(3)	(4)	(5)
31-3-1963	BG	259,033	31,417	12
(As found by the Kunzru Committee)	MG	102,471	14,847	15
31-3-1968	BG	288,765	25,310	9
(AS found by the Wanchoo Committee)	MG	103,794	9,955	10

31-3-1978	BG	403,865	37,258	9.22
	MG	115,124	9,813	8.52
31-10-1978	BG	407,263	40,299	9.90
	MG	113,341	9,315	8.22

561 It will be seen that on the broad gauge there has been a slight increase in the arrears of POH of wagons as compared to the position obtaining in 1968. However, on the meter gauge there has been a steady improvement.

562 The detailed position in respect of wagons overdue POH on the individual Zonal Railways is given in Annexure LVII. The position as obtaining on 31-10-78 is summarized in Table 63 below: -

TABLE 63
Railway-wise position of wagons overdue POH

Railway	Wagons overdue POH on 31-10-1978 as a percentage to the total holding	
	Broad Gauge	**Meter Gauge**
All Railways Average	9.90	8.22
Central	11.0	N.A.
Eastern	9.3	No MG
Northern	13.9	14.8
North-Eastern	N.A.	5.4
Northeast Frontier	1.3	5.5
Southern	7.29	8.5
South Central	Nil.	12.5 (May 1978)
South-Eastern	8.1	No MG

Western	11.2	8.4

563 It will be seen that on the broad gauge the percentages of wagons overdue POH on the Central, Northern and Western Railways were higher than the Northern and Western Railways were higher than the all-Railways average. On the meter gauge, the percentage of wagons overdue POH on the Northern and South-Central Railways were considerably higher than the all-Railways average. These Railway Administrations should take steps to bring down the arrears in POH of wagons.

564 In reply to the questionnaire of the Committee the South-Eastern Railway have stated that the railway workshops are finding it difficult to get adequate number of wagons for POH compelling them to carry out POH of BOX wagons six months ahead of their due date. South Central Railway has stated that arrears in POH of meter gauge wagons continue to be high due to the failure on the part of the other Railways to send wagons due POH to that Railway.

565 We note that, in the face of continuing arrears in POH of wagons on almost all the Railways, the Railway Board have surprisingly issued instructions to the Railway Administrations to temporarily advance POH of wagons by six months so as to enable adequate supply of wagons to, workshops for POH and to avoid under-utilization of the available POH capacity. In our opinion, such a step can be justified only after the POH arrears have been fully liquidated on all Railways. If spare POH capacity is Available on some Railways, it should first be utilized for clearing the arrears on other Railways to the extent possible.

566 **Analysis of roller bearing failures**:— (Recommendations 228, 229— Part II)The Wanchoo Committee recommended that periodical analysis of all cases of roller bearing failures on coaches and wagons, indicating date, year and station of mounting, particulars of last attention given, cause and responsibility etc., should be made so that remedial action, if required, can be taken. They suggested that RDSO should go into each case of failure of roller bearing and analyze every aspect including material used, the manufacturing accuracy and suggest remedies.

567 In their initial remarks the Railway Board had stated that the rate of failure of roller bearings on rolling stock on Indian Railways had been of the order of 0.075 per cent as against a failure rate of 0.25 per cent indicated in the Association of American Rail-roads Standards. They considered that this was satisfactory, and no special examination of this aspect was called for. They have now advised us that each case of roller bearing failure is fully investigated and all particulars of failed bearings are recorded by the Railways. This information is furnished regularly to the RDSO, both for goods and coaching stock, who in turn submit a periodical analysis of the failures to the Railways and the Railway Board indicating remedial measures. The Railway Board have added that detailed instructions have been issued and meticulous examination of roller bearing is carried out. The material before us is not clear as to whether the RDSO conducts periodical analysis and communicates the results thereof to the Rahway Board and the Railways.

568 We find that the number of roller bearings in use on rolling stock has gone up considerably since the appointment of the Wanchoo Committee. Failures of roller bearings have attracted considerable attention in recent years. On 26th November 1975 there was a serious accident resulting in the derailment of 20 UP Dehra Dun Express at Virar station on the Western Railway due to seizure of roller bearing on one of the coaches. The Additional Commissioner of Railway Safety who enquired into the above accident, inter alia, recommended as under: —

(i) All SKF type spherical roller bearings on coaching stock should be dismounted from journals and examined thoroughly during, attention in workshops.

(ii) A high-power committee consisting of Commission of Railway Safety, the RDSO, ICF and manufacturers of roller bearings may be constituted immediately to go into the adequacy of design, procedures for inspection, and maintenance (both on line and in workshops) and other cogpate factors and formulate suitable measures.

(iii) suitable device for detection of 'hot boxes of roller bearings may be evolved.

Within a period of one month following the above serious accident there were five more cases of seizures of roller bearings in quick succession, involving important trains, namely:

(i) 2 Dn. Kalka Mail at Aligarh on 29-11-1975.

(ii) Derailment of 6 Dn. Punjab Mail between Goshainganj and Rae-Bareli on 1-124975.

(iii) Derailment of 80 Up Taj Express on 17-12-1975.

(iv) 160 Dn. Tatanagar Express at Mi'lzapur on 22-12-1975.

(v) 58 Dn. Amritsar Express at Ambala Cantt. on 22-12-1975.

569 We In the wake of the above-mentioned six cases of roller bearings seizures on important mail and express trains, the Railway Board appointed a One Man Committee in December 1975 to investigate the incidence of roller bearing failures and to go into various aspects of servicing, maintenance and design of roller bearings and also suggest a device to detect or give a pre-waring of roller bearing seizure so that timely action may be taken to prevent an accident. To review the maintenance of roller bearings a meeting of Chief Mechanical Engineers of the Railways was held with the Railway Board in January 1976, at which technical representatives of roller bearing manufacturers were also present. With a, view to immediately arresting roller bearing failures a number of measures were ordered to be taken, inter cilia, requiring the Railways to examine roller bearing axle boxes in nominated sicklines under the supervision of a senior supervisor of workshops, to detect cases of slack broken studs and defective locking arrangements, to assess the condition of grease and to check the withdrawal sleeve. As an ad hoc measure, the Railways were directed to dismantle roller bearings in the workshops for thorough examination and also introduce ultrasonic flaw detection of roller bearing wheel sets of all types of ICF and BEML coaches as quickly as possible. For this purpose, the RDSO were required to finalize the procedures, standards and probes for echo patterns for the wheel sets.

570 We The One-Man Committee on roller bearings in its report of May 1976 concluded that long-distance faster trains registered

higher incidence of bearing distress than short-distance slower trains and majority of the cases of distress had taken place three or four months after periodical overhaul in workshops. Bearings on axle boxes which were directly underneath the coach lavatory drainpipes were found to be more prone to distress due to ingress of water. The experience of various railways had focussed on one aspect, namely unsatisfactory lubricant, the poor characteristics of which, under dynamic condition's, had been confirmed by changes in colour and consistency of grease in service. The One-Man Committee made a number of recommendations on maintenance practices in workshops, design aspects, material specifications, facilities to be created in railway workshop etc. The recommendations accepted by the Railway Board were circulated to the Railways in July 1977 for taking necessary action. Some of these recommendations were incorporated by the RDSO in their technical pamphlets containing instructions on inspection and maintenance of roller bearings on ICF and BE ML coaches.

571 We Failures of Roller Bearings on Coaching Stock:.--In November 1978, at the instance of the.. Railway Board, the RDSO had called for information from the Railways regarding roller bearing failures on coaching stock during the year 1977. Analysis of the information so received from some of the Railways was advised to the Railway Board in December 1978. This information for spherical and cylindrical roller bearings is given in Annexures LVIII and LIX. The summarized position of roller bearing failures in coaching stock during 1977 is given in Table 64.

TABLE 64
Failure of Roller Bearings in Coaching Stock During 1977

Type of roller bearing	Total no. of bearings in use	Failure of roller bearings					
		On line		In workshops		Total	
1	2	3	4	5	6	7	8
		Number	% of total	Number	% of total	Number	% of total
Cylindrical (BEML-BG)	47264	49	0.104	202	0.427	251	0.531
Spherical (ICF-BG&MG)	67376	128	0.19	2039	3.026	2167	3.25

572 It will be seen that the rate of failures of spherical roller bearings provided on ICF broad and meter gauge coaches increased to 3.25 per cent out of which failures on line constituted 0.19 per cent and rejections in workshops 3.06 per cent. In the case of cylindrical roller bearings provided on BEML broad gauge coaches, the rate of failure was comparatively lower, being 0.531 per cent out of which failures on line constituted 0.104 per cent and rejections in workshops 0.46 per cent.

573 The comparative incidence of roller bearing failures on coaching stock during 1966-67 to 1968-69 and in 1977 is given in Table 65 below:—

TABLE 65
Comparative position of failure of roller bearings in coaching stock

Type of coaching stock	Percentage of roller bearing failures in coaching stock to total number of bearings in use	
	1966-67 to 1968-69	**1977**
1. BG ICF Coaches (Spherical bearings)	0.37	2.105
2. MG ICF Coaches (Spherical bearings)	0.32	6.544
3. BG BEML Coaches (Cylindrical bearings)	0.01	0.531

These figures show an increase in the rate of failure of roller bearings on all types of coaching stock which calls for immediate attention.

574 Failure of Roller Bearings on Goods Stock:- The RDSO has stated that there are 20 different sizes and makes of roller bearings in use on broad gauge goods stock for axle loads varying from 16.3 to 22.9 tonnes. Cylindrical roller bearings of brands NBC, FAG, KOYO and PRETIS are used on 20.3 tonne wheel sets of BOX and other similar types of wagons and constitute about 92 per cent of the total population of roller bearing axle boxes on goods stock. The RDSO has made an analysis of failures/defects in respect of only these four brands of roller bearings on BOX wagons. The detailed position for 1976 and 1977 is given in Annexure LX and LXI. The summarized position of failures of roller bearings on BOX wagons is given in Table 66 below: —

TABLE 66
Failure of roller bearings on goods stock (BOX wagons)

Year	Total number of roller bearings in use	Failure of roller bearings on BOX wagons					
		On line		In workshops		Total	
		Number	Percentage	Number	Percentage	Number	Percentage
			$\frac{(3)}{(2)} X\ 100$		$\frac{(5)}{(2)} X\ 100$		$\frac{(7)}{(2)} X\ 100$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(5)
1976	491,320	800	0.16	2900	0.59	3700	0.75
1977	535,050	626	0.12	5054	0.94	5680	1.06

575 The figures show that the incidence of roller bearing failure had gone up to 1.06 per cent during 1977 as compared to 0.75 per cent in the previous year. When compared to the failure rate of 0.05 per cent during the period 1966-67 to 1968-69, there has been a substantial rise in recent years, and this needs urgent remedial action.

576 We feel that maintenance of roller bearings has not received the attention that it deserves, thereby resulting in increase in the rate of failure of roller bearings and Deterioration in the position since the appointment of the Wanchoo Committee. The Railway Board should take effective steps in this matter. We will go into this further and advert to it in the subsequent report.

577 **Facilities for Overhauling Roller Bearing Axle Boxes:—** Recommendations 230 and 231-Part II)—The Wanchoo Committee noted that roller bearing axle boxes are attended to only in the workshops at the . time of periodical overhaul which is scheduled at intervals of 9 to 12 months in the case of coaches and 31- years in the case of wagons. They considered it important that all carriage and wagon workshops should be provided with suitable and adequate facilities for overhauling roller bear-4 Mg axle boxes at the time of periodical overhaul or whenever such axle boxes are sent to (the workshops and that these are provided with dust-proof facilities. The Wanchoo Committee also drew the attention of

the Railway Board to the type and -manner of attention to roller bearings in workshops on the Japanese National Railways and suggested that the adoption of a similar system would be of advantage to the Indian Railways.

578 The Railway Board have advised us that adequate facilities for overhauling of roller bearing axle boxes have been provided in all the railway workshops. The Railways have also confirmed this. The Northern Railway has, however, stated that dustproof rooms are not available in Alambagh, Bikaner and Charbagh workshops and that wherever the facilities are lacking, proposals for providing them have been sent to the Railway Board. The Eastern Railway has also stated that action has been initiated for providing dust-proof rooms for overhauling of roller bearings. Thus the necessary facilities for attending to roller bearing axle boxes still remain to be provided on some of the Railways. The Railway Board should ensure that these facilities are provided in the remaining workshops without delay.

579 Referring to the system of attention to roller bearings in workshops on the Japanese National Railways, the Railway Board considered this system to be elaborate and costly. They stated that in view of the satisfactory performance of the existing system on the Indian Railways, which is in conformity with the **UIC*** and **AAR*** practices, the system followed on the Japanese Railways would not be of any advantage to the Indian Railways. Thus, this recommendation was not accepted by the Railway Board. Considering that there has been an appreciable increase in the rate of failures of roller

bearings on the Indian Railways during the last decade, an in-depth study of the extant maintenance practice's is called for.

*UIC- International Union of Railways.
AAR- American Assiociation of Railroads

580 **Detection of hot roller bearings: —** (Recommendation 310 (ii) Part II)— The Wanchoo Committee suggested that the problem of seizure of roller bearings on fast non-stop trains, particularly when the conventional method of station staff watching out for an overheated box from the station platform is no longer applicable, calls for urgent study and solution. They emphasized the need for evolving a suitable device. whereby the driver in the. 011 gets a timely warning of the mal-functioning wheel.

581 The Railway Board have advised us that a commercially viable heat indicator fit for installation on a coach has not been developed so far. However, a coach-installed hot box detector device oT Thermistor design has been developed by the RDSO and the proto-type was installed on one coach on the Northern Railway but before sufficient number of runs could be made by the coach, the Northern Railway reported pilferage of the device. The Railway Board have stated that another hot box detector has since been manufactured by the RDSO and is being installed for trials. The Western Railway also have under development a coach-installed device in which the temperature of the box is sensed through a thermo-couple and an electrical circuit is energized in the event of the temperature in the axle box rising above the pre-determined limit. The Railway Board

have informed us that trials on the above device are still in progress.

582 From the foregoing it will be seen that the hot box detector is still in the development stage. In the wake of increasing use of roller bearings on important mail and express trains and the introduction of more and more fast non-stop trains, it would be desirable to develop a hot box detector device at the earlier.

583 Examination of Coaches After Periodical Overhaul:— (Recommendations 184(i)—Part. I, 233—Part II)—The Wanchoo Committee observed that the rejection of coaches at the time of final examination by neutral control staff after periodical overhaul in certain workshops was between 25 and 56 per cent. Rejection was mainly due to defects in buffer heights, wheels tight to gauge, trough floorings corroded, brake beams safety hangers broken etc. They had viewed that the percentage of rejections reflects the quality of work done in the workshops and hoped that steps would be taken to improve the standard of workmanship so that the coach is in a perfect condition when it is offered for examination after periodical overhaul and the percentage of rejections is minimized. Referring to the increase in percentage of rejections in the case of workshops on the Central and North-Eastern Railways between 1962-63 to 1967-68, they urged that these Railways should pay greater attention to the maintenance of rolling stock in depots.

584 In their remarks, the Railway Board stated that the standard of repairs in workshops was being tightened. They added that checks by the neutral control organization ensured that no defective coach actually left the workshop.

585 The Wanchoo Committee had mentioned that, after POH in workshops and before being sent out, coaches are subjected to neutral control examination. We, however, wish to clarify that such examination is in force only at 17 out of a total of 31 workshops where repairs to coaching stock are undertaken. These workshops have been listed in Annexure LXII. The neutral control staff examine only the running gear and certain electrical components, and the results of their examination are given in the quarterly reports issued by the Indian Railway Conference Association which are sent for necessary action to the Railways and the Railway Board. For an appreciation of the performance of workshops and the trend in the rejection of coaches, we have scrutinized the reports for the quarter ending December 1970 and then three quarters ending March 1978, June 1978 and September 1978. Results of this examination are given in Annexures LXIII to LXVI. The percentage of coaches detained after POH due to defects at the time of final examination by neutral control staff, during the respective periods, is summarized in Table 67 below: —

TABLE 67

Results of final checks by neutral control staff after POH N.A.- Not available

Name of workshop (Railway)	Percentage of coaches detained by neutral control staff at final examination after POH, due to non-completion of repairs			
	Period – Quarter ending			
	Dec. '07	March '78	June '78	Sept '78
(1)	(2)	(3)	(4)	(5)
Broad Gauge				
Matunga (C)	17.4	12.1	31.7	60.4
Lilluah (E)	49.2	15.3	13.8	6.3
Alambagh (N)	29.1	80.6	69.4	57.0
Lallaguda (SC)	12.9	36.8	23.0	29.5
Perambur (S)	4.4	5.0	5.7	11.7
Golden Rock (S)	N.A.	Nil	Nil	Nil
Kharagpur (SE)	20.6	12.0	12.0	24.7
Raipur (SE)	N.A.	Nil	Nil.	Nil
Parel (W)	10.1	16.6	23.4	15.2
Meter Gauge-				
Bikaner (N)	Nil	Nil	Nil	Nil
Jodhpur (N)	10.5	12.6	14.7	4.9
Gorakhpur (NE)	6.0	4.3	3.9	29.4
Dibugarh	N.A.	Nil	Nil	2.6
New Bongaigaon (NF)	7.2	32.8	52.2	56.1
Mysore South (S)	8.3	7.4	Nil	Nil
Golden Rock (S)	1.9	0.4	21.4	8.0
Hubli (S)_	2.9	1.5	2.5	3.2
Ajmer (W)	11.5	12.1	Nil	19.9

586 From the results of checks made in September, 1978, it will be seen that the percentage of coaches detained due to non-completion of repairs at the time of outgoing inspection was still high in the case of some workshops. As compared to the position in 1970, there has been some deterioration in the page of broad gauge workshops at Matunga, Alambagh, Lallaguda, Perambur, Kharagpur and Parel and meter gauge workshops at Gorakhpur, New Bongaigaon, Golden Rock, Hubli and Ajmer. Thus, the rejection of coaches by neutral control staff at the time of final examination has increased in majority of the workshops and the recommendation of the Wanchoo Committee remains unimplemented. The Railways must take effective steps to improve the quality of workmanship in the workshops and bring down the rejections at the stage of final examination by neutral control staff. We shall advert to it in the subsequent report.

587 **Coaches passed without neutral control fit certificates:-** The quarterly reports also show the percentage of coaches passed out by workshops after POH, without obtaining fit certificate from neutral control staff. The position is summarized in Table 68.

TABLE 68

Incidence of coaches passed without neutral control fit certificates N.A.- Not available

Name of workshop (Railway)	Percentage of coaches passed locally after Poh without obtaqining neutral control fit certificate			
	Period- Quarter ending			
	Dec.'70	March'78	June'78	Sept.'78
Broad Gauge				
Matunga (C)	10.7	5.9	17.4	33.1
Lilluah (E)	48.2	17.2	28.8	6.2
Alambagh (N)	31.9	42.8	17.2	20.0
Lallaguda (SC)	51.7	42.9	24.8	27.9
Perambur (S)	N.A.	5.0	5.7	11.7
Golden Rock (S)	N.A.	Nil	21.4	15.6
Kharagpur (SE)	Nil.	6.3	5.9	15.8
Raipur (SE)	N.A.	Nilo	4.6	Nil
Parel (W)	1.7	12.5	20.0	14.6
Meter Gauge-				
Bikaner (N)	42.5	3.0	Nil	1.5
Jodhpur (N)	0.7	14.0	16.6	4.9
Gorakhpur (NE)	4.9	4.3	11.1	29.4
Dibugarh	N.A.	21.0	Nil	2.6
New Bongaigaon (NF)	Nil	37.2	30.5	55.6
Mysore South (S)	2.7	7.4	1.0	0.9
Golden Rock (S)	Nil	3.7	28.6	14.6
Hubli (S)_	Nil	Nil	Nil	Nil
Ajmer (W)	0.4	Nil	Nil	Nil

588 It will be seen that the percentage of coaches sent out of workshops without obtaining neutral control fit certificates was quite high in some workshops. It is disquieting that in the case of broad gauge work-&lops at Matunga on the Central Railway, Kharagpur on the South-Eastern Railway and meter gauge workshops at Gorakhpur on the North-Eastern Railway and New Bongaigaon on the Northeast Frontier Railway, the number of coaches passed locally without obtaining neutral control fit certificates had increased during 1978 as compared to 1970.

589 Taking Tables 67 and 68 together, we find that in some workshops where the percentage of coaches detained by neutral control staff due to non-completion of repairs was high, the percentage of coaches passed without obtaining neutral fit certificates was also high. The workshops at Matunga, Alambagh, Lallaguda and Kharagpur on broad gauge and Gorakhpur and New Bongaigaon on meter gauge stand out glaringly in this respect. The Railway Board should look into this and take urgent corrective action.

590 **Neutral control examination:—** (Recommendation 234(i), (ii)— Part II)—The Wanchoo Committee were of the opinion that neutral control examination served as a further check and had been generally useful in keeping wagons in good fettle and nothing should be done to weaken it in view of its independent character. They felt that due to the changing pattern of traffic, neutral control examination need not necessarily exist at the boundary points of the Railways as used to be the case in the past. They recommended that the Railway Board should

examine the existing set up of neutral control examination and decide the various points at which it should be located.

591 In their remarks, the Railway Board have advised us that review of the neutral control organization and its work is done from time to time. They added that recently the Efficiency Bureau of the Railway Board has examined the scope of Neutral Control Organization and recommended its extension to certain other marshalling yards on the broad and meter gauges. We, however, find that no directions have been issued to the Railways in this regard.

592 The Presently, the system of neutral control examination of wagons is in force at 104 points, consisting of one interchange junction, 12 marshalling yards, 28 workshops (Carriage, Wagon and Loco), 61 independent sick lines and at Gorakhpur and New Gauhati yards for examination of brake power on trains moving over Gorakhpur-Chupra and BongaigaonChangsari centralized traffic control sections. Besides, there are four neutral control flying squads, which are headquartered one each at Bhusaval on the Central Railway and Asansol on the Eastern Railway and the other two squads are attached to the Headquarters Office at New Delhi. These flying squads carry out special checks/surveys on trains at stations nominated by the Railways to record the conditions and details of repairs carried out by the carriage and wagon staff in yards and sicklines.

593 In reply to the questionnaire of the Committee, most of the Railways have stated that the scope of neutral control examination needs to

be extended 'further. The Central, Northern, North-Eastern, Northeast Frontier, South. Central, South-Eastern and Western Railways have suggested the extension of neutral control examination to interchange points as was in vogue in the past so as to improve the maintenance of rolling stock. They have stated that this would prevent bad stock from being passed from one railway to the other. The South-Central Railway has suggested that neutral control check should be on 100 per cent trains to bring up the standard of maintenance of rolling stock on all the railways.

594 As stated in the earlier paragraphs, the maintenance. of rolling stock has shown signs of deterioration in recent years. In the interest of safety of train operation, it is necessary that every effort should be made to improve the condition of rolling stock. Extension of the neutral control examination would appear to be an effective means to ensure this. The Railway Board are already seized of this matter and we would stress the need for an expeditious decision.

595 The Spat checks by neutral control flying squads:— (Recommendations 184(ii)—Part I, 235 (ii)—Part II)—The Wanchoo Committee observed that results of spot checks carried out by neutral control flying squads for 1967-68 highlighted deficiencies in train examination which should be speedily removed. They recommended that in order to reduce the incidence of derailments due to carriage and wagon defects, the neutral control examination should lay greater

emphasis on the compliance of safety rules and regulations regarding maintenance of stock.

596 In their remarks, the Railway Board compared the position regarding, percentage of wagons rejected by the flying squads in their spot checks in 1963-64 and 1967-68 to show that there was an improvement in the latter year. The comparative figures quoted by Railway Board are given in Table 69.

TABLE 69

Railway	Percentage of wagons rejected by neutral control flying squad in their spot checks	
	1969-64	1967-68
Central	92.5	61.8
Eastern	92.6	68.2
Northern	93.9	53.5
North-Eastern	91.4	57.7
Northeast Frontier	90.10	44.2
Southern	93.8	54.2
South Central	..	51.3
South-Eastern	96.7	65.5
Western	73.8	59.3

The Railway Board further stated that the reports by the neutral control flying squads included wagons which were on their way to the workshops for POH or to the sicklines for repacking of axle boxes and did not necessarily high light deficiencies in train examination by the normal train examining staff.

597 The For an assessment of the rejectable defects left over unattended, the neutral control flying squads conduct spot checks on trains, after these are released by railway staff. The results of these checks are submitted regularly to the Railways by the Indian Railway Conference Association and are also published in their annual reports. We have scrutinized the results of these spot checks conducted during the years 1974-75 to 1976-77 and the summarized position is given in Table 70.

TABLE 70

Results of spot checks by neutral control flying squads' rejectable defects left un-attended

Railway	Percentage of wagon units found with rejectable defects during final examination					
	1974-75		1975-76		1976-77	
	BG	MG	BG	MG	BG	MG
Central	94.3	99.2	90.4	96.6	94.3	-
Eastern	92.8	No MG	88.4	No MG	88.0	No MG
Northern	92.9	-	95.6	-	91.7	-
North-Eastern	-	91.0	-	93.4	-	89.1
Northeast Frontier	93.3	96.7	-	95.6	93.3	91.0
Southern	97.0	90.8	92.0	96.8	95.7	91.7
Soth Central	76.2	88.2	94.4	97.7	-	93.6
South-Eastern	92.7	No MG	89.0	No MG	89.1	No MG
Western	93.7	100.0	94.0	93.8	94.6	82.7

598 It will be seen that the performance, reckoned in terms of the percentage of wagon units with unattended rejectable defects by which the Railway Board indicated an improvement in 1967-68, has slipped back to the level obtaining in 1963-64. It is also clear that the high percentage of wagons found with rejectable defects has been persisting over these years on all the Railways.

599 The results of spot checks conducted by, the neutral control flying squads during the period 1974-75 to 1976-77 showing the number of wagons with rejectable defects having a direct bearing on safety' (i.e. those prefixed `S') which were left unattended on the broad and meter gauges are given in Annexures LXVII and LXVIII and are summarized in Table 71 below:-

TABLE 71

Results of spot checks by neutral control flying squad-wagons left over with rejectable defects prefixed 's'

Railway	Percentage of wagons found with rejectable defects having a direct bearing on Safety to the total number of wagons examined					
	Broad Gauge			Meter Gauge		
	1974-75	1975-76	1976-77	1974-75	1975-76	1976-77
Central	81.3	79.5	63.3	93.8		
Eastern	74.2	61.9	62.8	No meter gauge		
Northern	76.2	92.5	81.2	No spots checks done		
North-Eastern	No spots checks done			75.4	89.2	
Northeast Frontier	80.6	No spots checks done	87.3	83.3	88.7	
Southern	90.3	75.4	84.3	79.4	80.8	
Soth Central	81.7	77.0	-	80.8	85.4	
South-Eastern	77.5	59.9	58.1	-	No meter gauge	
Western	72.2	87.0	51.4	98.0	93.8	78.6
	77.8	68.1	63.2	78.9	86.9	80.7

600 It is a matter of concern that even after the wagons have been attended to by railway staff, a very percentage 'of these remain with `rejectable defects having a direct bearing on safety'. The spot checks, though limited in nature, show that a large number of wagons are running with such defects. This reveals a serious state of affairs and calls for urgent corrective action.

601 We had brought to the notice of the Railway Board the high percentage of wagons with `rejectable defects which have a direct bearing on safety' as detected by the neutral control flying squads during their spot checks. They have informed us that all the rejectable defects in question do not relate to unsafe features and stated that out of 161 items, mentioned in Chapter IV (Rejections), Conference Rules Part III, only 47 items have a direct bearing on safety and the others relate to maintenance features which do not by themselves constitute unsafe conditions for operation. The Railway Board have added that suitable revision of the Rules in question is in hand. The Railway Board have also stated that there are discrepancies in the compilation of annual reports by Indian Railway Conference Association, to which the attention of the latter has been drawn. It is surprising that 161 items should have been originally listed by the Railway Board as having .a direct bearing on safety and now only 47 items are considered to be in this category. We will go into this further and comment on it in the subsequent report.

602 **Overaged Coaches and Wagons:—** (Recommendations 188, 189-Part I, 237-Part II)-The Wanchoo Committee noticed a marked reduction in the number of overaged coaches on the broad and meter gauges and also averaged wagons on the broad gauge but a noticeable increase in the number of averaged' wagons on the meter gauge. They urged the Railway Board to make sustained efforts to reduce the number of such wagons particularly on the meter gauge. They considered that in view of the large proportion of overaged stock, which would have to be kept in use during the Fourth Five-Year Plan due to smaller allocation of funds, special attention would have to be given during periodical overhaul as well as during day-to-day maintenance and urged the Railway Board to give serious consideration if such stock may be given periodical overhaul at shorter intervals to keep them roadworthy and safe for operation.

603 The Railway Board have stated that due to sustained efforts of the Railways, there has been a reduction in the holding of overaged wagon stock. They have intimated that careful investigations have revealed that overaged stock, with the same periodicity of overhaul as for underaged stock, is being maintained to as good a standard as the underaged stock and that there is no need to give periodical overhaul to the averaged stock at shorter intervals. Thus, the recommendations in this regard were not accepted by the Railway Board.

604 The position in respect of overaged coaches and wagons has been shown in Annexures LXIX and LXX. The summarized position is

given in Table 72 and 73 below:-

TABLE 72

Comparative position of Overaged Coaches

Position as on	Holding of overaged coaches (vehicle units)		Overaged coaches as a percentage of total holding	
	BG	MG	BG	MG
31-3-1964	5077	3128	31.1	24.8
31-3-1968	3831	2855	22.6	20.9
31-3-1977	1485	1401	7.6	10.4

TABLE 73

Comparative position of overaged wagons

Position as on	Holding of overaged wagons (wagons units)		Overaged wagons as a percentage of total holding	
	B.G.	M.G.	B.G.	M.G.
31-3-1964	29103	12863	11.77	14.13
31-3-1968	18005	13549	6.55	13.96
31-3-1977	13589	8574	4.48	9.60

The figures show that there has been a noticeable reduction in the number of averaged coaches and wagons on both the broad and meter gauges.

605 The Railways have also furnished information regarding averaged coaches and wagons on the broad and meter gauges which is given in Annexures LXXI and LXXII. The position obtaining at the end of March 1977 shows a reduction in the holding of overaged coaches and wagons on most of 'the Railways except for meter gauge coaches on the Northeast Frontier Railway where the percentage has increased from 12.3 to 15.4.

606 From the age-wise information of averaged coaches furnished by the Railways we find that a substantial percentage of the averaged coaches has exceeded the coda! life by as much as 20 years on the broad and meter gauges. We hope that priority would be given to replacing these averaged coaches.

Miscellaneous matters and Research, Designs and Standards Organization

607 Medical Relief Vans:— (Recommendation 199-Part I) — The Wanchoo Committee hoped that special efforts would be made to complete the work of providing sidings with double ends for stabling medical relief vans, since this work had been outstanding for the previous three years or so.

608 The Railway Board, in their remarks, have stated that all medical relief vans are stabled in double-ended sidings.

609 We have examined the position in respect of stabling of medical relief vans in double-ended sidings on the basis of information furnished by the Railways. On all terminal stations, it has not been considered necessary to provide double-ended sidings. Of the rest, double ended sidings have not been provided at the under-noted twelve stations: -

Station	Railway	Station	Railway
Ajni	Central	Delhi (broad gauge)	Northern
Wardha	Central	Darbhanga Jn.	North-Eastern
Amla	Central	Chengalpattu	Southern
Agra Cantt.	Central	Mysore Jn.	Southern

Bhopal	Central	Camanore	Southern
Katni	Central	Bhojudih	South-Eastern

610 The question of providing double-ended sidings for stabling of medical vans has been with the Railways for more than fifteen years. We find no justification for the failure to implement this accepted recommendation.

611 **Narrow Gauge Lines:—** (Recommendations 72 and 200(i) and (ii)-Part I) The Wanchoo Committee observed that the Kunzru Committee had attributed the high incidence of derailments due to engine, carriage and wagon defects on the narrow-gauge lines, partly to the high percentage of overaged locomotives and rolling stock. They Pound that an the locomotives on one railway and all the coaches on another railway were averaged and that there was increase in the number of averaged wagons on most of the Railways. They further stated that, despite the urgency of the matter, no definite policy had been formulated by the Government in regard to narrow gauge lines. They drew attention to the action taken by the British Government, in a not dissimilar situation, on Lord Beeching's Report, regarding closing down of uneconomic lines, and recommended that similar action may be taken in India too.

612 In their remarks the Railway Board had stated that the future of most of the narrow-gauge lines was uncertain and, therefore, replacement of averaged stock was being done on an ad hoc basis, mainly on those sections which were decided to be retained. They have advised us that the Committee on

Uneconomic Branch Lines, constituted in 1969, went into the working of uneconomic branch lines and recommended that action should be taken to convert some of the narrow-gauge lines into wider gauges and to rehabilitate the others as expeditiously as possible. In the views of the Railway Board, though the codal life of narrow-gauge stock is the same as for the stock of other gauges, its, daily utilization is comparatively much less than that of other gauges; hence even when the narrow-gauge stock has reached its coda! life, the condition remains comparatively better. The replacement of narrow-gauge stock is being done primarily on `condition' basis.

613 We have compared the recent position of overaged locomotives, coaches and wagons on the narrow gauge lines with that obtaining at the time of the Kunzru and Wanchoo Committees. This is given in Table 74 below:

TABLE 74

Position of overage locomotives and rolling stock

A=Holding, B=Number overaged, C=percentage

$$\frac{(B)}{(A)} X\ 100$$

Railway	As on 31-3-1963			As on 31-3-1968			As on 31-3-1977		
	A	B	C	A	B	C	A	B	C
1	2	3	4	5	6	7	8	9	10
Steam Locomotives									
Central	92	21	22.8	55	20	36.4	58	35	60.3
Eastern	4	-	-	19	9	47.0	19	17	89.5
Northern	56	27	48.2	49	19	38.8	28	19	67.9
Northeast Frontier	31	20	64.5	31	31	100.0	25	25	100.0
Southern	8	3	37.5	10	6	60.0	7	3	42.9
Soth Central	-	-	-	30	10	33.3	30	22	73.3
South-Eastern	120	57	47.5	110	62	56.4	111	67	60.4
Western	97	30	30.9	96	38	39.6	87	42	48.3
All Railways	408	158	38.7	400	195	48.8	365	230	63.8
1	2	3	4	5	6	7	8	9	10
Coaches									
Central	428	290	67.8	210	129	61.4	194	102	52.5

Eastern	21	11	52.4	88	88	100.0	86	85	98.9
Northern	161	139	86.3	185	132	71.4	177	80	45.1
Northeast Frontier	83	42	50.6	84	28	33.3	69	20	28.0
Southern	30	27	90.8	23	10	43.5	30	17	56.6
South Central	-	-	-	-	-	-	219	128	58.4
South-Eastern	500	302	60.4	468	225	48.1	464	245	52.8
Western	436	185	42.4	803	303	37.7	319	95	29.7
All Railways	**1659**	**996**	**60.0**	**1861**	**915**	**49.2**	**1558**	**772**	**49.5**
Wagons									
Central	1223	799	65.3	817	608	74.7	817	622	76.13
Eastern	3	1	33.3	83	81	97.6	73	70	95.89
Northern	280	158	56.4	478	259	54.2	272	199	73.15
Northeast Frontier	458	212	46.3	421	248	50.9	188	57	30.31
Southern	98	80	81.6	92	75	81.5	60	53	88.33
South Central	-	-	-	-	-	-	404	255	63.12
South-Eastern	2385	1235	51.8	2339	1177	50.3	2216	1216	54.87
Western	1579	617	38.4	2560	1035	40.4	1050	598	56.95
All Railways	**6026**	**3182**	**51.5**	**6790**	**3483**	**51.3**	**5080**	**3070**	**60.43**

614 According to the information furnished to us by the Railways, there are also heavy arrears of track renewal on narrow gauge lines and speed restrictions have had to be imposed on long stretches.214

615 We find that the narrow gauge lines are still being worked with increasing preponderance of overaged locomotives and rolling stock; there are also heavy arrears of track renewal. We consider that to continue to work them under these conditions is hazardous. They must, therefore, be either closed down or fully rehabilitated. The Government should take an early decision in the matter.

616 **Documentation section:—** (Recommendation 215—Part 1) — The Wanchoo Committee reiterated the recommendations made by the Kunzru Committee that the documentation section of the RDSO need to be adequately expanded and modernized so that the personnel working in the RDSO got knowledge of the results of research carried out in different parts of the world. They hoped that the Railway Board would adopt a suitable policy speedily.

617 The Railway Board have stated that the need of strengthening the documentation section is recognized. Consequent to the acceptance of the recommendation, the RDSO submitted a plan for reorganization and expansion of their documentation and publication section, suggesting the creation of gazetted posts, posts of translators, documentation assistants etc. Provision of adequate strength of office staff was also envisaged. In view of the financial constraints, the Railway Board decided that the reorganization and expansion scheme should be gradually implemented com-

mencing from April 1971 and spread over a period of 3 to 4 years.

618 The RDSO have advised that the documentation and library facilities are not adequate to serve the growing needs of the organization in view of the pace of development and research in various fields of science and technology in recent years. They submitted a scheme for a computer based technical information center which includes provision of suitable computer and repro-graphing facilities with the help of which it would be possible to provide services like selective dissemination of information, bibliography, current awareness list etc., to facilitate reference by research workers.

619 We note that at present only a skeleton documentation section is functioning and expansion of the scheme has been deferred due to financial stringency. Thus, the recommendation of the Wanchoo Committee remains unimplemented. We feel strongly that the absence of a well-equipped and modern documentation section is a severe handicap to any research organization, more so to the only such institution in the Railways. Economy in this can only hamper the effectiveness of the research organization and hence prove to be self-defeating.

620 **Operations research:—** (Recommendations 298, 299—Part In—The Wanchoo Committee observed that it would be useful to make a quantitative assessment of where and what safety facilities should be provided on the various Railways and to what extent safety would be improved by doing so. An analysis of data such as the location of accidents, conditions of trains, human and other factors and the facilities provided on

each of the Railways may yield useful clues as to the relationship between the prevention of accidents and the safety facilities required. They stressed that greater reliance would in, future ' have to be placed on methods of operations research if the ultimate object of the research organization was to maximize efficiency, safety and long-term economy.

621 It The Railway Board have stated that methods of operations research were being pursued by the various Railways and studies in regard to quantitative assessment of where and what safety facilities should be provided and the extent of improvement in safety achieved thereby was a continuing process on the Railways. The value of operations research in maximizing efficiency, safety and long-term economy was fully recognized. The RDSO has advised that the principles of operations research are adopted for its own work.

622 It We have been advised that, besides the operations research cell in the Railway Board, which was set up in 1973, at present there is no separate operations research cell on the Railways or in the production units. in fact, operations research cell in the Railway Board is also experiencing lack of full participation by the Railways and production units in some of the research projects. There are no officers available on the Railways to assist the operations research team of the Railway Board in conducting the studies and the possibility of setting up of separate operations research cells on the Railways is being examined. We have been informed that the operations research cell in the Railway Board undertakes studies of complex problem areas of railway working which are generally of, all-India dimensions. Some of the studies made by the operations research cell so far relate to utilization of

diesel locomotives on the Eastern Railway, simulation studies of Delhi and Jhansi areas, study of production Scheduling in Diesel Locomotive Works, Varanasi, etc.

623 It will be seen that the principal objective of operations research studies has so far been to rationalize the methods and procedures of working with a view to improving efficiency and effect economy in expenditure but no operations research study appears to have been made so far in the specific area of improving safety in railway operations.

624 It Thus, it is clear that operations research has not so far been employed by the Railways to improve the standard of safety as was envisaged by the Wanchoo Committee. This recommendation, therefore, remains unimplemented.

625 It We have been advised that some of the areas in which operations research can be usefully applied are:—

(i) Analysis of derailment and train parting accidents for arriving at the correlation between track characteristics, locomotive power, loads and speeds of trains on the one hand and their combined impact on accident probabilities on the, other, analysis of the circumstances viz., mix of speed, load, track, etc. which cause train partings and/or derailments.

(ii) Analysis of vulnerable level crossings to gin-point the mix of factors such as extent of rail traffic, frequency of road vehicles, lay-out of approach roads, etc. which could render one

level crossing more vulnerable to accidents than the other; and

(iii) Contribution made by fatigue, lack of adequate experience, reflexes response etc. to the occurrence of accidents.

626 We feel that operations research will be a useful tool to improve the standard of safety in train 'operation and urge the Railway Board to take effective steps in this direction. The setting up of operations research cells on the Railways will be a step in the right direction and should be expedited.

627 **Vehicle dynamics:—** (Recommendation 310(i)—Part II)— The Wanchoo Committee observed that, with the increased speeds of rolling stock and the introduction of fast non-stop trains, the subject of vehicle dynamics had assumed great importance. They considered that research on the various aspects of riding quality of rolling stock from the viewpoint of safety and comfort as also stress analysis on vehicle structures and important components would have to be pursued and, if necessary, 'expanded and suggested that this research must be suitably dovetailed into a wide-ranging study of derailments to establish guidelines for designs and maintenance practices which were conducive to greater safety.

628 The Railway Board have stated that this subject is receiving .continuous attention in the RDSO and in the railway research institutions of other Countries as well. There is mutual exchange of information and data on the subject and design and maintenance practices are based on such information.

629 The RDSO has informed us that track-vehicle interaction studies are planned with the help of Track Recording-cum-Research Car, to lay down more rational track tolerances and track classification procedures as well as to assess the behaviour of vehicles under dynamic conditions. On the Indian Railways, the assessment of maximum permissible speed of a -vehicle, as related to available track structure and maintenance conditions, is made by 'on line' tests to determine the stability and riding comfort of various types of vehicles on representative track. Based on the results of these investigations, the vehicle is cleared for general operation at a particular speed. While this experimental method is accepted all over the world as the only reliable method for determining the safe operating speed of vehicles, it is not possible to have trials under simulated conditions of track-vehicle imperfections. The RDSO have stated that field studies stiffer from various drawbacks, for instance: —

(i) There is lack of flexibility in incorporating different parameters in the design and incorporation of modifications on the prototype involves considerable time and effort followed by costly time-consuming re-tests.

(ii) On safety considerations, the vehicle cannot be tested up to the threshold of derailment on running lines which is necessary for arriving at realistic criteria for judging stability and for evolving a more comprehensive appreciation of the mechanics of derailments.

(iii) On safety track parameters cannot be varied individually or severally for assessing their effect on vehicle riding so as to lay down limiting values for various parameters concerning track.

(iv) Certain phenomena like axle and bogie hunting at high speeds, bogie and axle guiding action on curves with and without braking and traction forces, derailment tendencies of vehicles on curves when subjected to coupler loads and dynamic deflections of vehicles and natural frequencies cannot be safely simulated and studied in actual field trials; and

(v) With increasing traffic density and non-availability of blocks, 'on line' tests are costly and time-consuming.

The RDSO has added that due to the increasing awareness of the -aforesaid shortcomings in 'on line' tests, the Railways in advanced countries like U.S.A., Japan, Germany, United Kingdom and France etc. now lay strong emphasis on theoretical and laboratory studies. The RDSO consider that such an approach has become essential on the Indian Railways also. They have, therefore, proposed setting up of a vehicle dynamics test rig as a laboratory facility, which would facilitate conducting of comprehensive investigations in the field of track-vehicle dynamics. For trials under simulated conditions of track-vehicle imperfections the RDSO has proposed to -set up a test-track. We understand that neither of the two proposals has so far been agreed to by the Railway Board.

630 In our view, the setting up of vehicle dynamics test-rig and the. laying of a test-track are essential to fully evaluate the performance of various design concepts to the limits of their operating capabilities, under controlled and simulated conditions. We would impress upon the Railway Board the need to give priority to the setting up of these facilities at the earliest.

631 Expansion of Research, Designs and Standards Organization:— (Recommendation 210—Part I and 311—Part Wanchoo Committee were of the view that expansion of the RDSO would be necessary so that they are able to play the role assigned to them. Besides vehicle dynamics which had assumed great importance of late and was, therefore, a fruitful subject for research, they listed certain other fields like laying down of guidelines for design, and maintenance practices conducive to greater safety, problems of seizure of roller bearings, development of self-propelled ultrasonic rail inspection cars for detection of rail flaws, problem of speed on turnouts of varying degrees, etc. in which research was necessary.

632 In their remarks, the Railway Board have advised us that the expansion of RDSO has kept pace with its expanding activities and would continue to do so according to the requirements.

633 It In their comments the RDSO has stated that the general ban on creation of posts is acting as a constraint in the expansion of RDSO, commensurate with the increased level of developmental activities actually undertaken and expansion necessary to enable them to play the assigned role. It has been stated that the need for strengthening and bifurcation into two independent directorates of the eisting Civil Designs Directorate was accepted by the Railway Board as far back as 1972 but has not been implemented presumably due to financial constraints. In reply to the questionnaire of the Committee the RDSO has also listed the additional facilities in various disciplines of railway operation which they consider necessary. We attach great importance to the

work and development of the RDSO. We propose to go into these aspects further and shall advert to it in our subsequent report.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

(CHAPTER II- BRIEF STATISTICAL APPRECIATION OF IMPORTANT CATEGORIES OF TRAIN ACCIDENTS DURING THE PERIOD 1968-69 TO 17977-78)

001 We find that, after a steady fall in the incidence of total accidents to 10.4 per million train kilometers during 1971-72, it sharply rose to 15.2 in 1972-73 and further to 25.0 in 1974-75. This was followed by a decline for two years and then a rise again in 1977-78 when the incidence of total accidents per million train kilometers was 20.9 as compared to 18.7 in the previous year. This does not reveal a healthy trend.

(Para 14)

002 There was, by and large, a fall in the incidence of important accidents per million train kilometers except for the years 1974-75 and 197576 during which there was an increase. After some improvement in 197677, the incidence of important accidents again increased in 1977-78 both on the broad and meter gauges. On the narrow gauge, after an abrupt fall during 1968-69, the incidence of important accidents per million train kilometers steadily rose to 6.10 during 1973-74. This was

followed by a decline for three years to 4.10 in 1976-77. In 1977-78 there was a significant increase in the incident of important accidents to 5.84 per million train kilometers.

(Paras 17 and 18)

003 On the broad gauge, after a sharp drop in the incidence of train collisions to 0.12 per million train kilometers in 1968-69 as compared to 0.16 in the previous year, it fluctuated between 0.12 and 0.15 till 1973-74 when there was a sharp increase to 0.19. This was followed by a declining trend. On the meter gauge also, there has been a general declining trend. On the narrow gauge too, the incidence of train collisions has come down in recent years. **(Paras 21 and 22)**

004 The incidence of collisions involving passenger trains on the broad gauge fluctuated considerably during the last decade. The declining trend from 1968-69 to 1972-73 got reversed during 1973-74 and 1974-75 when the incidence increased to 0.16 per million train kilometers, thus going back to the level obtained in 1967-68. They then declined for two years to 0.09 in 1976-77 but again rose to 0.15 in 1977-78. In the case of goods trains on the broad gauge, after a general rising trend from 1968-69 to 1973-74, during which period the incidence increased from 0.11 to 0.22 per million train kilometers, there has been a steady

decline in the incidence during the last five years and was 0.08 during 1977-78.

(Paras 23 and 24)

005 On the meter gauge, the incidence of collisions involving passenger trains registered a sharp decline during 1968-69, being 0.05 per million passenger train kilometers as compared to 0.15 in the previous year. During 1970-71 the incidence rose to 0.07 and has remained almost static thereafter. Collisions of goods trains on the meter gauge have shown a general declining trend except for the two intervening years 1974-75 and 1975-76 when their incidence rose sharply.

(Paras 23 and 24)

006 On the broad gauge, there was a reduction in the incidence of derailments in 1968-69 as compared to the previous year, after which it has remained almost static. Taking passenger and goods trains separately, we find that while the incidence of derailments of passenger trains has not shown much change, there has been considerable decline in the incidence of goods train. derailments during the 10-year period of our study as compared to the position obtaining in the 5-year period ending 1967-68. **(Paras 25 and 26)**

007 On the meter gauge, the incidence of derailments of passenger trains had

recorded a general decline in the quinquennium 1968-69 to 1972-73, but during the subsequent 5-year period ending 1977-78 there was considerable deterioration in the position and the incidence per million passenger train kilometers has gone back to the level obtaining prior to 1967-68. In the case of goods trains on the meter gauge, there was a sharp drop in the incidence of derailments during 1968-69 to 4.91 as compared to 7.7 in the previous year; it has remained around that level since then.

(Paras 25 and 26)

008 There has been, by and large, a downward trend in the incidence of accidents at both manned and unmanned level crossings during the 10-year period ending 1977-78. Since level crossing accidents account for 45 per cent of the fatalities in all accidents, the decline in their number is a healthy sign. During the 5-year period covered by the Wanchoo Committee, the average annual number of persons killed and injured in level crossing accidents was 45 and 169 respectively. As against that, during the 10-year period ending 1977-78 the average annual number of persons killed and injured had gone up to 93 and 229 respectively. This clearly shows that the fall in the incidence of level crossing accidents does not rear a reduction in the hazard to human life and limb in these accidents. Since just less than half of the total

deaths in railway 'accidents are accounted for by level crossing accidents, the gravity of these needs no further emphasis.

(Paras 27 and 28)

009 There was a sudden drop in the incidence of fires in trains on both :the broad and meter gauges during 1970-71 as compared to the previous year. This was due to the revision in classification of accidents falling in this category, consequent to implementation of recommendation 32401i) in Part H of the report of the Wanchoo Committee, whereby fires in diesel and electric locomotives began to be treated as 'engine failures'. Thereafter the incidence of fires in trains on the broad gauge had increased. However, since 1974-75 there has been a declining trend. On the meter gauge, the incidence of fires increased during 1975-76 followed by a decline during the next two years.

(Paras 29 and 30)

010 Engine failures had recorded a sharp increase in 1972-73 and the figures had more than doubled by 1975-76. The increase during 1972-73 was due to the revised classification of engine failures according to which a diesel or electric locomotive is considered to have failed if it causes a delay of 30 minutes or more to the train it is hauling (as against the earlier figure of 60 minutes or more). After a sharp drop. in engine failures during

1976-77, their number again increased in 1977-78. **(Paras 31 and 32)**

011 The declining trend in the number of failures of couplings and . draft gear which had set in prior to the appointment of the Wanchoo Committee, continued till 1973-74 after which there has been an upward trend. In 1976-77, the number of such failures rose sharply to 621 as compared to 382 in the previous year. Though their number dropped to 526 in 1977-78, it is still quite high as compared to the position prevailing prior to 1976-77.

(Paras 31 and 33)

012 Failures of other rolling stock such as failures of tyres, axles, . wheels, brake apparatus, etc. which had been steadily declining till 1973-74 had doubled during 1974-75. This was followed by a decline in such failures during 1975-76 and 1976-77. However, during 1977-78, there was an abnormal increase in their number from 300 (in the previous year) to 1267. This sudden increase is disquieting and calls for investigation and action.

(Paras 31 and 34)

013 From the break-up of 1267 failures of other rolling stock during 1977-78. We find that the Central and South-Eastern Railways accounted for 620 and 615 failures respectively, i.e. 97.5 per cent of the total. While

surprisingly no such failure was reported on the North-Eastern, Northeast Frontier and Southern Railways, only 2 such failures were reported on the Northern, 9 on the Western, 10. on the Eastern and 11 on the South-Central Railways. It appears that the figures reported by most of the Railways may not be correct and the reporting of such failures and compilation of statistics in this regard need to be thoroughly looked into. **(Para 34)**

014 There was a sharp rise in the number of failures of permanent way .during 1972-73. This was followed by a further jump in 1976-77, the rise being mainly due to Increase in the number of broken rails. The incidence of broken rails per 100 kilometers of running track increased from 0.14 during 1968-69 to 1.22 during 1976-77. During 1977-78, the incidence stood at 0.91. The steep increase in the incidence during the last decade is a matter of concern and calls for corrective action.

(Paras 31, 35 and 36)

015 Failures of overhead wires has shown a general decline since :1973-74.

(Paras 31 and 37)

016 Compilation of separate statistics of failure of signalling apparatus 'commenced only from 1975-76. No trend is discernible during this short period except that during 1977-78, there has been an increase in

such failures as compared to the previous two years. **(Paras 31 and 37)**

017 The declining trend in the incidence of miscellaneous accidents, viz. trains running over obstructions, collisions involving light engines, trollies, derailment of light engines, fires at stations, etc. which had commenced prior to the appointment of the Wanchoo Committee continued till 1971-72. This was followed by an increase in the incidence of such accidents during 1972-73 and 1973-74, after which there has again been a steady decline. **(Para 38)**

018 There has been a general declining trend in the incidence of averted collision , breach of block rules and disregard of signals by drivers. **(Paras 39 and 40)**

019 The incidence of passenger train partings per 100 million vehicle kilometers has dropped considerably during the last 10 years. During 1977-78, the incidence was. 0.19 as compared to 1.36 during 1968-69. There has been a fall in the incidence of train partings on goods trains also, though not as marked as in the case of passenger trains. The incidence of goods train partings per 100 million wagon kilometers. has dropped from 5.45 in 1968-69 to 3.22 in 1973-74. The incidence had gone up for 2 years during 1975-76 and 1976-

77; however, during 1977-78 it dropped to 3.88 as compared to 4.62 in the previous year.

(Paras 41 and 42)

020 There has been a general decline in the incidence of important accidents, miscellaneous accidents and indicative accidents during the 10-year period from 1968-69 to 1977-78 as compared to the position obtaining in the 5 year period' from 1963-64 to 1967-68 which was reviewed by the Wanchoo Committee. **(Para 43)**

021 Failures of railway equipment, namely, locomotives, rolling stock, permanent way, etc., however, increased substantially during the period 1968-69 to 1977-78. This demands immediate attention and action. **(Para 43)**

022 We find that the years 1974-75 and 1975-76 stand out as two significantly bad years as far as accidents are concerned. During these years, the incidence of almost all categories of accidents increased sharply. This increase has been attributed by the Railway Board mainly to the general labour unrest which culminated in the all-India railway strike in May 1974 and its aftereffects. This clearly brings out the importance of healthy industrial relations on the Railways for safe and efficient operation of trains. **(Para 43)**

SUMMARY OF FINDINGS AND RECOMMENDATIONS

(SERIOUS ACCIDENTS DURING THE YEARS 1968-69 to 1977-78— CAUSES AND CONSEQUENCES)

023 During the 10-year period from 1968-69 to 1977-78, there were 219 serious accidents on the Indian Railways. Out of these, in 218, statutory enquiries were held by officers of the Commission of Railway Safety and in one case enquiry was held by a Commission of Inquiry appointed tender the Commissions of Inquiry Act, 1952.

(Para 46)

024 While serious accidents constituted only 2.3 per cent of the total number of important accidents, these accounted for 49.1 per cent of the total fatalities, 43.7 per cent of the injuries and 20.7 per cent of the loss due to damage to railway property in all categories of important accidents. **(Paras 47 and 48)**

025 During the period from 1973-74 to 1977-78, there were 114 serious accidents as compared to 74, 79 and 85 serious accidents during the earlier three 5-year periods commencing from 1957-62.

There was, thus, an increase in the number of serious accidents during the last 5-year period ending 1977-78. During the same period, the incidence of serious accidents per million train kilometers increased to 0.048 from 0.036 in the previous two 5-year periods.

(Paras 51 and 52)

026 We find that the incidence of serious accidents which fall in the categories of important accidents when taken as a proportion of the total number of important accidents. has been continuously rising even though the number of important accidents has been failing. This, *prima facie,* indicates that the consequences of important accidents are becoming more serious. **(Paras 53 and 54)**

027 The number of serious accidents due to failure of drivers registered an increase of 50 per cent during the periods 1968-69 to 1972-73 -and 1973-74 to 1977-78 over those in the earlier two 5-year periods. **[Paras 55 and 56(i)]**

028 Serious accidents due to failure of station staff, which decreased considerably during the period 1968-69 to 1972-73, again went up during the period 1973-74 to 1977-78 to the level obtaining prior to 1968-69. **[Paras 55 and 56(ii)]**

029 There was a decrease in the incidence of serious accidents attributable to train wrecking during the period 1973-74 to 1977-78 as compared to the earlier 5-year period.

[Paras 55 and 56(iii)]

030 Accidents at level crossings due to failure of road-users increased sharply during the period 1973-74 to 1977-78 as compared to the position obtaining in the earlier three 5-year periods of our review.

[Paras 55 and 56(iv)]

031 The incidence of serious accidents due to failure of locomotives went up during the period 1973-74 to 1977-78.

[Paras 55 and 56(v)]

032 The incidence of serious accidents due to failure of rolling stock has been continuously rising since the period 1963-64 to 1967-68. This is a disturbing trend and calls for urgent corrective action.

[Para 55 and 56(vi)]

033 We The incidence of serious accidents due to failure of track has also increased in recent years. From 3 serious accidents during the 5-year period 1963-64 to 1967-68, their number had

increased to 5 and 8 during the next two 5-year periods. **[Paras 55 and 561vii)]**

034 We There was a substantial increase in the incidence of serious accidents due to fires in trains during the last 10 years. From 3 serious accidents during the period 1963-64 to 1967-68, their number shot up to 10 during the period 1968-69 to 1972-73 and to 12 during the period 1973-74 to 1977-78.

[Paras 55 and 56(viii)]

035 We Miscellaneous causes, namely, faulty, securing of consignments, failure of catenary, moving train hit by objects on the platform and other causes accounted for 14 and 12 serious accidents during the two 5-year periods 1968-69 to 1972-73 and 1973-74 to 1977-78 respectively, as compared to 12 during the 5-year period 1963-64 to 1967-68 and 7 during the period 1957 to 1962. **[Paras 55 and 56(ix)]**

036 We Failure of railway staff or human element was responsible for the largest number of serious accidents. The proportion of accidents attributable to human element has remained almost static around 43 per cent during the last three 5-year periods. Failure of equipment, *i.e.,* locomotives, rolling stock and track takes the next place after failure of railway staff

and the proportion of serious accidents due to these causes has steadily increased from 7.6 to 18.4 per cent during the last three 5-year periods of our review. **(Paras 57 and 58)**

SUMMARY OF FINDINGS AND RECOMMENDATIONS
(REVIEW OF THE IMPLEMENTATION OF ECOMMENDATIONS MADE BY THE WANCHOO COMMITTEE THE HUMAN ELEMENT)

037 Although the recommendations of the Wanchoo Committee referred to in Para 63(i) and (ii) of this report were accepted in principle, it has not been possible for the Railways to implement them. The recommendation in Para 63(iii) was not accepted by the Ministry of Railways.

(Paras 63 to 66)

038 While machinery exists on most of the Railways to promptly redress grievances of staff, the welfare organization on the South Central Railway is inadequately staffed.

In a huge organization like the Railways employing about 15 lakhs regular employees and 3 lakhs casual labour, grievances are bound to exist, especially having regard to the complicated rules and procedures. While the observance of staff welfare weeks/fortnights serves limited objectives and renders limited help, there is need for

gearing up the machinery to ensure that staff representations are expeditiously attended to at all times.

(Paras 67 to 72)

039 We find that some Railways are giving training to welfare inspectors while some are not. Personnel management is a specialised subject and welfare inspectors should be fully equipped for the same. We recommend that persons who are to work as welfare inspectors should be given proper training either before or within a specified period of taking up duties as welfare inspectors so that they have an idea of the background in which they have to function.

(Paras 67 and 73)

040 The time taken by the Railways for finalizing of accident cases exceeded in all eases the target laid down by the Railway Board. In respect of cases where minor or major penalties were imposed and also where major penalty chargesheets were issued but minor penalties were imposed, the average time taken exceeded the target by a very wide margin. Thus, the recommendation made by the Wanchoo Committee remains substantially unimplemented. We would urge the Railway Board to take steps to ensure that the causes

of delay in finalizing accident cases are identified) and remedial measures taken to achieve the target laid down by themselves.

(Paras 75 to 78)

041 In respect of the Wanchoo Committee's recommendation that senior supervisors should always be consulted in regard to promotions and transfers of staff in their charge, we find that the Railways have expressed opinions which are divergent from the views of the Railway Board. This recommendation of the Wanchoo Committee does not appear to have been fully implemented. **(Paras 79 and 80)**

042 In respect of the recommendation in para 79 (ii) of this report, we consider that it would be difficult to evolve scales of pay which do not overlap at all. In any case, such a position does not ordinarily obtain in any department of the Government or any public sector undertaking. We, however, note that, to the extent- the idea behind this recommendation could be accepted, action has already been taken within the framework of the recommendations of the Third Central Pay Commission. **(Paras 79, 81 to 83)**

043 Regarding the Wanchoo Committee's recommendation in para 79(iii) of this report in respect of upgradation of certain supervisory posts, we

feel that this has been substantially implemented to the extent it was accepted by the Railway Board.

(Paras 79 and 84)

044 As the figures for 1976-77 show, there is no improvement in the officer-staff ratio and the position in this regard in the major departments concerned with safety of rail travel, namely, Transportation, Civil, Mechanical, Electrical and Signal and Telecommunication Engineering ha, in fact, deteriorated as compared to the position obtaining in 1962-63. The Wanchoo Committee's recommendation, therefore, remains unimplemented. We would urge the Railway Board to take urgent action to bring about an improvement in the officer-staff ratio.

(Paras 85 to 90)

045 We feel that it is necessary to have a clear definition of the term `supervisor' before determining the ratio of supervisors to staff. Having clearly identified supervisory staff, it would be necessary to take immediate steps to arrive at a rational supervisor-staff ratio and we recommend accordingly. **(Paras 85, 91 to 93)**

046 It has taken almost 8 years for the Railways to finalize the stages at which 'in-service' psycho-technical tests are to be administered in the case of some operating categories. No decision appears to have been taken so far for the application of psycho-technical tests at the time of conversion training of staff from steam to either diesel or electric traction. We would urge the Railway Board that the decisions now taken for 'in-service' application of psycho-technical tests to certain categories of staff should be implemented without further delay. It is also necessary that the stages for `in-service' psycho-technical testing in the case of remaining categories of staff, directly connected with the safe running of trains, are also prescribed at the earliest.

(Paras 94 to 100)

047 We find that, even though the Railway Board had agreed in principle to widen the scope of activities of the Psycho-technical Cell, not much progress has been made in this direction due to inadequacy of staff. Thus, the Wanchoo Committee's recommendation for extending the scope of labour science research on the Indian Railways remains substantially unimplemented.

(Paras10 to 106)

048 In the light of the views of the Ministry of Home Affairs, the Railway Board did not consider it advisable to proceed with the proposed legislation of debarring prosecution of railway staff without sanction of the competent railway authority. In some States, there are rules which provide for sanction to be obtained at an appreciably higher level in the police hierarchy before prosecution is launched. This was meant to avoid capricious prosecution of staff. Having regard to the views expressed by the Ministry of Home Affairs and the State Governments, we feel that there is no necessity to pursue this recommendation further.

(Paras 107 to 111)

TRAINING OF STAFF

049 We find that though the recommendation of the Wanchoo Committee for setting up centers of training for electrical signal maintainers has been substantially implemented, there are deficiencies in the facilities for training in schools/centers on some Railways, especially in respect of models of sophisticated signalling equipment. We would urge the Railway Board to ensure that the Railway Administrations provide these

facilities in schools for training of signal maintainers as early as possible.

(Paras 113 to 116)

050 The Wanchoo Committee's recommendation referred to in para 117 of this report regarding recruitment training and grades of signalling staff, has been substantially implemented. The Railway Board should take steps to see that their directive in this regard is implemented on the North-Eastern Railway as well.

(Paras 117 to 119)

051 We Training facilities for panel operators are Still to be developed on some of the Railways. This recommendation has, therefore, been only 'partially implemented. We would urge the Railway Administrations to create the necessary facilities for training of panel operators without further' delay.

(Paras 120 to 123)

052 We find that though the planning for setting up a centralized, training school for electric supervisory staff commenced in 1971-72, not much progress has been made in the construction of the school building; only part of the hostel accommodation has been completed and laboratory equipment. models, etc., have still to be procured. Thus, the progress of

setting up of this school has been extremely poor. We feel that proper training of electric supervisory staff cannot be ensured in the absence of a centralized training school with necessary laboratory equipment, models, etc. Thus, imparting of basic training to electric supervisory staff, envisaged by the Wanchoo Committee, remains unfulfilled. The matter will not brook any further delay and we would urge the Railway Board to ensure the provision of a properly equipped centralized training school with a sense or urgency.

(Paras 124 to 126)

053 The Wanchoo Committee's recommendation for setting up schools for training artisan staff employed in the maintenance of general electric and train lighting services, has been substantially implemented. The Eastern and Southern Railways should take urgent steps to set up their own training centers for artisan staff for electric traction.

(Paras 124, 127 and 128)

054 We find that there is no uniformity in the minimum educational qualifications prescribed for selecting staff from the steam side for conversion training in diesel and electric traction. The staff who are being given conversion training range from illiterates to

matriculates. Thus, the recommendation that staff should have adequate education and technical background remains unimplemented on most Railways. We agree that the staff utilized for operating diesel and electric locomotives should possess the necessary skill and aptitude and a minimum level of education for acquiring Sol proficiency of a reasonable standard.

(Paras 129 to 136)

055 Facilities for conversion training of driving staff from steam side to diesel/electric side have been by and large, developed on all the Railways.

(Paras 129 and 137)

056 The Railway Board had not accepted the recommendation regarding simulation training of drivers. The Railways have also not adopted simulation training in its accepted concept, though some form of rudimentary simulation training is in vogue on some of the Railways.

(Paras 129, 138 to 140)

057 We are constrained to note that no progress has been made in the setting up of a centralized training center for training of staff for mechanized inspection

and maintenance of track, even after a lapse of 10 years, and this recommendation of the Wanchoo committee remains unimplemented. We would urge the Railway Board to take expeditious steps for the setting up of such a centralized training school at the earliest.

(Paras 141 to 144)

058 There has been a steady fall in the percentage of steam engine failures due to mis-management by engine crew on the broad and meter gauges. From the performance of individual Railways, however, we find that in the case of broad gauge on the Northeast Frontier, South-Eastern and Western Railways and meter gauge on the Central Railway, there was an increase in engine failures due to mismanagement by engine crew during 1977-78, as compared to the previous year. These Railway Administrations should Whir effective steps to reverse this trend.

(Paras 145 to 148)

059 We find that the available training capacity is grossly under-utilized. This recommendation, therefore, remains unimplemented. We feel that the factors which militate against full utilization of the training capacity have been known for a very long time, but remedial action is still wanting,

Viewed against the background of heavy arrears of refresher training to be overtaken, the present position is totally indefensible. The Railway Board should take effective steps in this direction and ensure full utilization of the training capacity.

(Paras 149 to 154)

060 The Railways have attributed the backlog in refresher training to inadequacy of trainee reserve posts, failure to nominate staff for training, failure to make relief arrangements in time, nominated staff reporting sick etc. We cannot understand why the Railways are still feeling the shortage of trainee reserve posts when the Railway Board have categorically informed us that this need has already been adequately provided for. All these factors are well within the control of the Railways and should not have been put forward as an alibi. **(Paras 155 to 158)**

OTHER STAFF MATTERS

061 We find that no clear definition of who should be treated as essential staff for the purpose of allotment of houses has so far been lain down by the Railway Board and uniformity in the criteria for so classifying the staff is still missing.

(Paras 160 to 162)

062 It will be seen that the annual rate of construction of staff quarters has been falling continuously since 1965-66. As a result of this, the percentage of staff housed, which had increased to 37.81 in 1968-69 as compared to 34.81 in 1955-56, has marginally declined in recent years and stood at 37.14 in 1977-78. We feel that Parliament having approved charging of the cost of construction of staff quarters to Capital and to dividend being payable only on such Capital if the Railways have surplus after discharging, all other liabilities, there should have been an increase in the number of staff quarters constructed. We hope that necessary steps in this direction will now be taken by the Railway Board. **(Paras 163 to 168)**

063 We find that the Wanchoo Committee's recommendation regarding proper job analysis of the work of signal maintainers and their rostering in 8/12 hour shifts, as may be necessary, has not been implemented on all the Railways. A permanent solution to the problem of attending to failures during night has also not been possible on some Railways. We would urge the Railway Administrations to look into this for early implementation.

(Paras 170 to 174)

064 We are happy, to note that in the case of hours of running duty of drivers grade 'A' and 'B', working mail, express and passenger trains, there has been a marked improvement and there were only stray cases of running duty exceeding 10 hours on a few Railways.

The incidence of running duty of more than 10 hours at a stretch in the case of driver's grade 'C' working goods trains is high and ranges between 14.0 per cent on the Southern. Railway to 34.0 per cent on the North-Eastern Railway, in comparison to the position obtaining in 1967-68, the incidence of trips with running duty exceeding 12 hours at a stretch has gone up on the Central and North-Eastern Railways. The incidence of trips with more than 14 hours running duty when taken as a percentage of the total number of trips by goods train drivers were 8.8, 3.1, 7.8, 1.5, 5.8 and 1.9 on the Central, Eastern, North-Eastern, Southern, South Central and Western Railways respectively. Trips of more than 20 hours running duty at a stretch accounted for 1.0, 1.1 and 0.9 per cent of the total number of trips on the Central, North-Eastern and South-Central Railways. We find that the recommendation made by the Wanchoo Committee and accepted by the Railway Board still remains to be implemented in the case of driver's

grade 'C' working goods trains on all the Railways. It is unfortunate that in a matter which has such a direct bearing on safety, the action taken so far has been tardy.

(Paras 175 to 179)

065 We feel constrained to say that much remains to be done in the matter of upkeep of running rooms. In view of the introduction of new trains, changes in the pattern of train services and general improvement in the standard of living of the people, we feel that the assessment of accommodation, amenities and facilities to be provided in and maintenance of running rooms has to be a continuing process so that running staff directly connected with safety of train operation should have adequate rest in modestly furnished, clean and sanitary rooms.

(Paras 180 to 184)

066 Shortages of staff in the categories of station masters, assistant station masters, switchmen and cabinmen had increased on all the Railways in 1977-78 as compared to the position in 1967-68. In the case of most other safety categories of staff also, shortages have increased on majority of the Railways. We are unable to accept the claim made by the Railway Board that the position in respect of shortages of

staff has improved to a great extent. Thus, the recommendation of the Wanchoo Committee remains unimplemented for most categories of staff on the Railways. The need to wipe out the shortages cannot be over-emphasized, and we would urge the Railway Board to take effective measures in this regard.

(Paras 185 to 189)

067 From the information furnished by the Central and Western Railways, we find that the incidence of overtime working persists to a significant extent even in the case of safety categories to staff. The Railway Board should take effective steps to bring down overtime working to the minimum in the case of categories of staff connected with safety of train operations

(Paras 190 to 194)

068 The present level of leave reserves which Railways have been permitted to operate in various categories has been found inadequate and this recommendation of the Wanchoo Committee remains unimplemented. **(Paras 195 to 199)**

069 There has, so far, been no reduction in the time taken for finalizing the recruitment to different categories of staff; on the contrary, the time actually taken in some cases has been much in excess of the target. **(Paras 200 to 206)**

070 We find that guidelines for the jurisdiction of permanent way inspectors were issued before the introduction of high-speed trains on the Indian Railways. The last decade has seen considerable changes in track structure, methods of track maintenance and inspection. In view of these developments, it would be necessary to review the jurisdiction of permanent way inspectors. **(Paras 207 to 209)**

071 We feel that having lad down a yardstick for determining the strength of signal and telecommunication inspectors, the Railway Board must take urgent steps to implement it within the shortest possible time.**(Paras 207 and 210)**

072 It is necessary that the guidelines laid down for the strength of carriage and wagon inspectors are implemented without insisting on matching surrenders. **(Paras 207 and 211)**

073 The Railway Board felt that it was not opportune to issue a uniform yardstick for determining the strength of loco inspectors due to wide variations from railway to railway. We do not consider this as sufficient reason for not laying down a yardstick for loco inspectors. **(Paras 207 and 212)**

Permanent Way

074 The recommendation of the Wanchoo Committee for providing 60 kg/m rails on sections were the density of traffic may not have reached 20 gross million tonnes but may be rapidly increasing, had not been accepted by the Railway Board. Some of the Railways have informed us that even though minimum track standards for trunk routes and main lines have been laid down, there are sections carrying a large number of high-speed trains where the track structure remains below the stipulated standard. It is necessary that the track structure is brought up to the stipulated standard at the earliest.

(Paras 216 to 220)

075 We are happy to note that considerable progress in the laying of long/continuous welded rails has been made on the Central and Northern Railways. On the Southern and South-Central Railways, the progress in this respect has not been commensurate with their track kilometrage and would need to be accelerated. The South-Eastern, North-Eastern and Northeast Frontier Railways have a relatively larger proportion of fish-plated track, and we would urge these

Railways to take effective steps for the welding of rails expeditiously.

(Paras 221 to 224).

076 We Railways' requirement of wooden sleepers during the 5-year period ending 1977-78 was met to the extent of only 41 and 50 per cent on the broad and meter gauges respectively. It is quite clear that the supply position of wooden sleepers has not at all been satisfactory. The forecast for their supply in the future also does not appear to be encouraging due to dwindling forest resources. Having regard to these considerations, the Railways will have to rely more and more on other types of sleepers and alternative means like axle counters for track circuiting etc.

(Paras 225 to 228)

077 We are constrained to note that the average annual progress of laying concrete sleepers during the period 1973-78 had been only 52 kilometers which was 5 per cent of the length of primary sleeper renewals done on the Railways during the said period. The supply of concrete sleepers has not built up during the last decade as was envisaged by the Wanchoo Committee and their recommendation in this regard, therefore, remains substantially unimplemented.

(Paras 229 to 232)

078 The Wanchoo Committee had envisaged the use of concrete sleepers as an alternative to wooden sleepers for track circuiting. There has, however, been very little progress in the use of concrete sleepers in track circuiting. We note that due to the unsatisfactory electrical resistance of the present designs of concrete sleepers, their use in track circuiting works has been permitted with reservations. Having regard to the fact that the Ministry of Railways are committed to the provision of track circuiting on a programmed basis and noting that not enough wooden sleepers would be available, we feel that unless greater efforts are made in regard to the procurement of concrete sleepers, it is unlikely that any significant progress can be made in future. For this purpose, it is also necessary to develop concrete sleepers which can be used for track circuiting without any restrictions or reservations.

(Paras 233-234)

079 We find that the recommendation of the Wanchoo Committee for providing guard rails and walkways on girder bridges has not been fully implemented on all the Railways. We hope that the Railway Board will ensure that all

girder bridges, on all the Railways, are provided with guard rails and walkways, without exception, within a short period.

(Paras 235-237)

080 We find that deficiencies still remain in the maintenance and equipment of level crossings and in the training of gatemen in safety procedures. In view of the heavy toll of life and limb that accidents at level crossings take, their proper maintenance and training of gatemen in the protection of rail and road traffic cannot be over-emphasized. It is important, therefore, that the Railway Administrations give higher priority to remedying this situation.

(Paras 238-241)

081 With reference to the Wanchoo Committee's recommendation referred to in para 242 of this report, nothing appears to have been stipulated regarding the periodicity at which the ballast diagram should be revised. In effect this recommendation of the Wanchoo Committee does not seem to have been accepted by the Railway Board and the earlier practice on the Railways continues.

(Paras 242-243)

082 We are in agreement with the Railway Board that no specific percentage of clean ballast for undertaking complete re-ballasting need be laid down. Maintenance recoupment of ballast is a continuing process for the proper upkeep of track and such recoupment should be done on the basis of actual requirements.

(Paras 244-245)

083 During the 5-years period ending 1977-78, the total quantity of ballast procured by all Railways averaged 2.68 million cubic meters per annum. Some portion of the total quantity of ballast so procured must have been used on works of track renewals and increasing ballast cushion, Therefore, there is no doubt that the quantity of ballast used for recoupment has considerably fallen short of the Railway Board's own assessment of 2.8 million cubic meters per annum. We find that some Railways have shortfall while others have none. It is surprising that the information given by the Railways, does not corroborate the conclusions of the Railway Board that adequate quantity of ballast is being procured for 'recoupment. We also do not consider as adequate the reasons given by some of the Railways for not carrying out an important work on which depends the effectiveness of track maintenance and health of the track.

This recommendation of the Wanchoo Committee, therefore, has not been fully implemented. The Railway Board should take urgent steps to see that the procurement of ballast is increased to meet fully the requirements for normal recoupment.

(Paras 246-248)

084 The Wanchoo Committee had expressed the hope that the Railways will step up the pace of track renewals and bring down the backlog. Not only has this hope been belied, but the position has deteriorated considerably, and its ill-effects are becoming apparent from the rising incidence of rail breakages and imposition of speed restrictions on increasing lengths of track. We view this matter with great concern and would strongly recommend that no efforts should be spared in solving this problem in all its aspects.

It is disconcerting to note that against Railway Board own estimate of requirements of funds for track renewals of Rs. 560 crores dining the quinquennium 1978-83, only Rs. 350 crores are stated to have been tentatively earmarked for this purpose. We understand that this matter has also been taken up by the Railway Board with the Planning Commission. We do hope that the Railways' full requirements of funds for track renewals

in the coming years will be made available so that the arrears are wiped out at the earliest.

(Paras 249-257)

085 We Two branch lines which are owned by private companies and are worked by the Northeast Frontier Railways, i.e. Chaparmukh-Silighat (83.67 kilometers) and Kataghal-Lalaghat (38.10 kilometers) are being maintained with great difficulty at a restricted speed of 25 kmph and 15 kmph respectively, due to overdue track renewals, as the concerned company is not willing to share the cost of replacement. Since this is an important matter concerning the safety of train operations we would like to impress upon the Railway Board the need to take special steps to complete track renewals on the above-mentioned lines on an urgent basis.(Para 258)

086 While the Wanchoo Committee had suggested reduction in the percentage of unserviceable sleepers to the barest minimum, we find that a significant length of track continues to have more than 20 per cent unserviceable sleepers. This recommendation has, therefore, not been implemented.

(Paras 259 and 260)

087 Against 1247 bridges treated as distressed at the time Of the Wanchoo Committee, the number over a period of 10 years has increased to 3553. The sharp increase in the number of distressed bridges is disquieting. A special programme designed to complete the rehabilitation of these bridges within a specified time is, therefore, called far.

(Paras 261-264)

088 A uniform concept of what a 'distressed bridge' implies is still lacking. We consider that, for a correct appreciation of the magnitude of the problem of rehabilitation of distressed bridges, a definition of the term 'distressed bridge' is called for. **(Para 265)**

089 We find that the evolution of a rational formula for determining the gang strength has been considerably delayed and the Wanchoo Committee's recommendation remains unimplemented. The Railway Board should direct the Gang Strength. Committee to submit its recommendations expeditiously and finalize the issue speedly. **(Paras 266-268)**

090 We find that the recommendation of the Wanchoo Committee for making available one curve corrector on each division is still to be implemented. The usefulness of

the curve corrector having been proved in field trials, we consider that the Railway Board should take steps to expedite its development and make them available on each division of the Railway.

(Paras 269-272)

091 We Though annual testing of track by ultrasonic means has not been introduced on all tracks as recommended by the Wanchoo Committee, substantial progress in this direction has been made. Due to the increasing arrears in track renewals and rise in the incidence of rail breakages, we consider ultrasonic testing an essential and effective means of ensuring safety and efficiency of train operation. We hope that with the receipt of additional rail flaw detectors, not only will the periodicity of testing be increased, but increasing length of track will be covered by ultrasonic testing.

(Paras 273-277)

092 We During the 5 years period from 1973-74 to 1977-78, the number of rail fractures on running lines of Indian Railways had almost doubled, compared to those during the period 1963-64 to 1967-68. Except on the Eastern, North-Eastern and Southern Railways, the number of rail fractures has increased on all the other Railways. The increase on the

Northern, Northeast Frontier, South Central and South-Eastern Railways is disquieting. Each rail fracture in the running lines is a potential hazardto the safety of trains. We would, therefore, urge the Railway Board and the Railway Administrations to take effective steps so that flaws in rails are detected in time and the defective rails are removed from track before these develop into fractures.

(Paras 278-279)

093 We find that there is a wide disparity in the number of 'broken rails' as given in the accident statistics published annually by the Railway Board and the number of rail fractures on running. lines as advised to us by the Railways. It would appear as if all fractures occurring on running lines on the Indian Railways are not being reported as accidents. The Railways Board and the Railway Administrations should look into this discrepancy in reporting and compilation of accident statistics and take necessary corrective action. **(Para 280)**

094 We note that from 18 tie-tamping machines in 1968, their number increased to 50 in 1978. Mechanized maintenance has been extended to cover 5000 kilometers of track on trunk routes and

main lines of all except the North-Eastern and Northeast Frontier Railways. We commend the progress so far made in mechanization of track maintenance and hope that the same would be maintained.

(Paras 281-283)

095 The position regarding traffic blocks for the mechanized maintenance of track leaves much to be desired and the Wanchoo Committee's recommendation has not been fully implemented. It has been admitted by the Railway Board as well as the Railway Administrations, that for various reasons, it has not been possible to give adequate traffic blocks required for working of on-track tie-tamping machines. It is inevitable that, in the circumstances, maintenance will suffer and the cumulative effects of this over a period of time will have a vital bearing on safety. The position will get further aggravated with increased use of concrete sleepers. The need for granting regular traffic blocks of sufficient duration on day-to-day basis cannot, therefore, be over-emphasized. Ways and means to arrange this must be found.

(Paras 284-288)

096 We are happy to note that between 1970-71 to 1977-78, the length of track monitored by track recording cars on the broad gauge had increased nearly two-

fold from 39,577 to 74,748 track kilometers and on the meter gauge from 2730 to 8000 track kilometers. We hope that this progress will be maintained and increasing length of track would be brought within the scope of monitoring by track recording cars.

(Paras 289-291)

097 We agree with the views of the RDSO and the Railway Board that no useful purpose would be served by equipping each division of the Railways with a Hallade track recorder. **(Paras 292-295)**

098 The stand now taken by the Railway Board that the custody of stores is an inseparable part of the duties of permanent way and signal inspectors and that they cannot be divested of this responsibility is a reversal of their stand on the recommendations made by the .Kunzru Committee in 1962. In view of the fact that this matter had engaged the attention of three high-level Railway Accident Enquiry Committees, i.e. the Shahnawaz Committee 1954, the Kunzru Committee-1962, and the Wanchoo Committee--1968, we feel that such an important issue should not have been decided only on the basis of the views of the Pay Commission. Thus, the Wanchoo Committee's recommendation remains unimplemented. **(Paras 296-299)**

Level Crossings

099 We find that the recommendation of the Wanchoo Committee, that some norms should be fixed for deciding whether a particular unmanned level crossing should be manned and whether a manned level crossing requires upgrading. has not been implemented. The need for laying down appropriate norms for manning of unmanned level crossings and upgrading of manned level crossings cannot be over-emphasized. Considerable delay in this regard has already taken place and norms should be laid down as recommended by the Wanchoo Committee, without further delay.

(Paras 306 to 310)

100 The recommendation of the Wanchoo Committee that in no case should a gate remain with only one man on duty all the 24 hours has been substantially implemented.

(Paras 311 to 315)

101 The overall utilization of the 90 per cent and 10 per cent of the Railway Safety Works Fund up to March 1979 had been only 42.6 per cent and 55.7 per cent respectively. 90 per cent Railway Safety Works Fund of the share of West Bengal remains unutilized since 1966., In

Uttar Pradesh, Madhya Pradesh and Bihar also, despite a substantial network of the railway system, the utilization of this fund has been poor. Provision of road over-: bridges and under-bridges and manning or upgrading of level crossings will undoubtedly improve the safety of rail and road traffic at level crossings.

Non-utilization of the aforesaid fund defeats the very purposes for which this fund has been set up. In our opinion there appears to be need for more persistent efforts on the part of the State Governments and the Railways to utilize the 90 percent Railway Safety works Fund in the shortest possible time. Utilization of the 10 per cent Railway Safety Works Fund depends primarily on the Railways themselves. The Railway Board should ensure that each Railway plans for a sufficient number of works of manning of unmanned level crossings And upgrading of manned level crossings in their annual Works Programme for full utilization of the 10 per cent Railway Safety Works Fund.

(Paras 316 to 321)

102 The Wanchoo Committee had recommended provision of tele-phone communication at all mid-section manned level crossing. The Railway Board had issued instructions for provision of

telephone facilities at all Special, 'A' and 'B' Class level crossings and only such of the 'C' Class manned level crossings on Rajdhani routes as are in the block section and are normally kept open to road traffic. According to the information furnished to us by the Railway Board, all Special Class level crossings have been provided with this facility. The information from the Railways, however, shows that 24 Special Class level crossings are yet to be provided with telephone communication, and a substantial number of 'A' and S' Class level crossings have not been provided with this facility so far. Thus, this recommendation still remains to be fully implemented. The Railway Board should complete this long outstanding work at all midsection manned level crossings on a time-bound programme. **(Paras 322 to 326)**

103 Implementation of the Wanchoo Committee's recommendation regarding provision of lifting barriers at all important level crossings has necessarily to be phased. We would urge the Railway Administrations to take up this work on a time-bound basis, giving priority to important level crossings.

(Paras 327 to 331)

104 The first trial with automatic half-barriers, which was carried out at

Unnao on the Northern Railway in September 1972, was found to be satisfactory. No further trials could, however, be carried out due to considerable difference of opinion and reluctance on the part of the Railways. The police authorities have also not favoured such trials in metropolitan areas. **(Paras 332 to 337)**

105 Since 1968-69, 637 level crossings have been interlocked with signals on all the Railways. Implementation of this recommendation covering increasing number of level crossings, is necessarily a continuous process. However, we find that some level crossings on the suburban sections of the Eastern and South-Eastern Railways still remain to be interlocked. On the Eastern Railway, 23 '13' Class level crossings, where the track is on a curve, also remain to be interlocked with signals. We would urge these Railway Administrations to complete the work of interlocking of gates with signals at the above noted level crossings on priority. **(Paras 342 to 344)**

Signalling and Interlocking

106 Good progress in the provision of colour light signalling has been made and the number of stations provided with colour light signalling has increased from 331 in 1968-69 to 1007 in 1977-78.

The implementation of this recommendation is a continuous process, and we hope that this progress will be maintained and even improved. **(Paras 347 to 351)**

107 Although the Railway Board had accepted the recommendation of the Wanchoo Committee regarding electric lighting of semaphore signals and trials on some Railways had shown satisfactory results and proven the effectiveness of this measure for improved lighting and visibility of signals, the progress made in the last eight years has been unduly slow. The Railway Board should take steps to complete this work on a time-bound basis.

(Paras 352 to 357)

108 Multiple-aspect signalling still remains to be provided at 12.5 per cent of the stations on the broad and meter gauge trunk routes and 65 per cent of the stations on the main lines of both gauges. Although the implementation of the Wanchoo Committee's recommendation in this respect has necessarily to be phased, we would urge the Railway Board to take up the provision of multiple aspect signalling at the remaining stations on trunk routes and main lines as early as possible.

(Paras 358 to 362)

109 There has been no significant progress in the implementation of the Wanchoo Committee's recommendation regarding separation of warner signals in the rear of outer signals. The separation of the warner signal from the outer signal has a very important bearing on safety. The recommendation of the Wanchoo Committee having been accepted, should be implemented with a greater sense of urgency. **(Para 363)**

110 We understand that there still remain considerable deficiencies in the visibility distance for the first stop signal provided in 2-aspect signalling as well as in the inter-signal distances in 2-aspect and multiple-aspect signalling and these do not conform to the emergency braking distances as determined by trials.

(Paras 364 to 369)

111 We find that except for the high-speed routes, the question of resiting of signals on the basis of the results of braking distance trials on the remaining sections does not appear to have been taken up so far. Inter-signal distances have considerable bearing on safe running of trains and the need to resite signals on the basis of braking distances cannot be over-emphasized. We understand that this matter along with other interrelated issues is

presently under the consideration of the Railway Board, which should take a very early decision and ensure its speedy implementation. **(Paras 364 to 370)**

112 It is a matter of serious concern that the implementation of the Wanchoo Committee's recommendation for providing suitable reflective material, like scotchlite, on sighting boards having a direct bearing on safety of train operation has been considerably delayed on the ground of lack of foreign exchange. We feel that there has been a lack of sense of purpose and urgency when the one alternative which was being developed indigenously has been found unsatisfactory in performance. Considering that the requirement of foreign exchange for import of this material cannot be very large and that scotchlite reflective material is being used extensively by other Government departments and public sector undertakings in the country, e.g. roadways, airlines, etc. as also the relatively easier availability of foreign exchange, there is no reason why this should not be imported by the Railways also, even at this stage. **(Paras 372 to ,374)**

113 Compared to the average of 76 stations per year provided with track circuiting during the 5-year period 1963-64 to 1967-68, 139 stations per year on an average, were track circuited during the

10-year period from 1968-69 to 1977-78. During 1977-78 track circuiting was completed at 162 stations. This progress is commendable.

114 Besides 329 broad gauge and 98 meter gauge stations on the trunk routes and 'important' main lines where track circuiting work is still to be programmed, there remain another 169 broad gauge and 702 meter gauge stations on other main lines where no plans Tor track circuiting have been made so far. Thus, even the completion of track circuiting of run-through lines on trunk routes and main lines is not yet in sight. Early action should be taken to get this work done on a time-bound basis.

(Paras 375 to 380)

115 In respect of track circuiting of all passenger lines at wayside stations, it has not been possible to make much headway due to non-availability of wooden sleepers nor are axle counters available in adequate numbers instead. There has been very little progress in the use of concrete sleepers in track circuiting works. Due to the unsatisfactory supply position of wooden sleepers, it is necessary that alternatives like suitable concrete sleepers and axle counters are made available in the required numbers for completing the works of track circuiting and detection facilities at

all stations where these are considered necessary. **(Paras 381 to 389)**

116 We find that the Railway Board are still going ahead with track circuiting between fouling marks despite the clear recommendation of the Wanchoo Committee that this should be done between the block clearance points.

(Paras 384 to 388)

117 Very little progress has been made in the provision of Automatic Warning end Stop System (AWS) even on the restricted scope accepted by the Railway Board. Out of 2,780 route kilometers programmed on trunk routes with speeds of 120 kmph and over and 1,128 route kilometers on suburban sections in Calcutta, Bombay and Madras areas, AWS has been provided only on 248 and 94 kilometers respectively. The poor progress in the last 15 years has been due to reluctance to import the equipment and to excessive time taken for its indigenous development and manufacture of the AWS equipment. We consider that the Railway Board should take steps to fulfil atleast their diluted commitment of providing AWS on trunk routes and suburban sections at the earliest. In doing so, it will no doubt take full advantage of the available sources of supply in the country

and undertake imports if necessary, so as to complete speedily this important safety measure. It is also necessary that a programme should be drawn up for extending AWS on all trunk routes with speeds of 100 kmph and above, covering all passenger and goods trains.

(Paras 389 to 392)

118 We note that very little progress has been made in research and development in the field of cab signalling in the last decade and a half after the recommendation was first made by the Kunzru Committee. Technology in this sphere is continuously advancing and several systems are in use in foreign countries. The Indian Railways should take advantage of these developments and evolve a suitable system for use under Indian conditions.

(Paras 393 to 395)

119 We As regards time blocks for maintenance of signalling equipment, the Railway Board did not accept the. Wanchoo Committee's recommendation for making provision of fixed time blocks in the timetable nor have they offered any solution to this vexing problem which has serious repercussions on safety.

(Paras 396 to 398)

120 The strength of officers and inspectors in the signal and telecommunication department on most Railways is not commensurate with the existing workload. It is surprising that even after deficiencies in this respect had been brought out in the study undertaken by the Efficiency Bureau and accepted by the Railway Board, the Railways have been asked to rationalize the workload on the basis of the existing strength. It is disquieting that for the new equipment also, posts are not being provided as per the yardstick. Intensification of inspections apart, it would appear that even the extant schedules of inspection are not feasible due to inadequate strength of officers and inspectors. This is serious matter to which we would draw the attention of the Railway Board and urge that immediate steps should be taken to rectify the situation and ensure that meaningful inspections by officers and inspectors of the signal and telecommunication department are carried out. We consider that any economy in this regard would be misconceived.

(Paras 399 to 406)

121 We find that 65 stations on the broad and meter gauges still remain to be interlocked. We are of the

opinion that even in the case of stations on river ghats or stations on sections worked under one engine, only system, the possibility of a derailment at the points is not precluded if the stations are interlocked. We, therefore, reiterate what the Kunzru and Wanchoo Committees had suggested, namely that rudimentary interlocking should be provided at all stations on the broad and meter gauges.

(Paras 407 to 411)

122 During 1976-77 and 1977-78 there had been an increase in the incidence of failures of signal and interlocking gears related to traffic density. We would urge the Railway Board to take steps to check the rising trend and bring down the failure rate. In the case of block instruments, the incidence of failures has shown some improvement.

(Paras 412 to 415)

123 The Northern Railway had the highest number of track circuit failures followed by the Western and Eastern Railways. These Railway Administrations should analyze the causes of failures and take steps to bring them down.

(Paras 416 to 419)

124 The shortfall in overhaul of lever frames and block instruments and replacement of lever frames has sharply increased in recent years as compared to the position obtaining prior to 1970-71. According to the Railways, the main reason for this shortfall is non-finalization of the yardsticks for maintenance staff and shortage of staff. This is a serious matter and if left unremedied, can only lead to further deterioration and serious repercussions. Special efforts in this regard are called for on the Eastern, Southern, South Central and South-Eastern Railways where the backlog of overhaul of lever frames has increased considerably during 1977-78 as compared to the previous years. Backlog in replacement of lever frames on the Eastern and Northern Railways had increased substantially during 1977-78 as compared to the previous year and needs to be brought down. Thus, the Wanchoo Committee's recommendations for clearing the 'backlog of overhauling of lever frames and block instruments and replacement of lever frames not only remain unimplemented but there has been, a distinct deterioration in the situation except in the case of replacement of block instruments. We would urge the Railway Board and the Railway Administrations to take urgent steps to effect an improvement in this respect.

(Paras 420 to 425)

125 We Regarding the Wanchoo Committee's recommendation for laying down yardsticks for determining the strength of block, electric and mechanical signal maintainers, the Railway Board decided that it would not be practicable for a big railway system like the Indian Railways to have a uniform yardstick and the Railways were advised to evolve local yard--sticks. Thus, the Wanchoo Committee's recommendation in this respect remains unimplemented. **(Paras 420 and 426)**

MOTIVE POWER

126 Our analysis shows that as far as engine failures are concerned. The position of steam, diesel and electric locomotives has been unsatisfactory, and their performance has fallen much below the target laid down by the Railway Board. No specific reasons for this deterioration have been given either by the Railway Board or the zonal Railways nor has any indication been given of the action contemplated to improve the position. The matter calls for urgent and concerted efforts to reverse this trend, particularly when such expensive assets are involved. **(Paras 430 to 437)**

127 We The recommendation of the Wanchoo Committee regarding pro--vision of speedometers speed-recorders accepted by the Railway Board, has still not been implemented and the Railway Board's claim in this regard is not corroborated by the information supplied by the Railways. The Railway Board must ensure that speedometers speed-recorders are provided on all locomotives working trains and no locomotive which is to work a train leaves the shed or yard without a speedometer/speed-recorder in working order. **(Paras 438 to 442)**

128 We find that even after 10 years, the Railways still have no - satisfactory design of a speedometer. We cannot help feeling that if a more determined effort had been made by the Railway Board, a suitable speedometer could have been developed during this period. **(Paras 443 to 446)**

129 While the recommendation of the Wanchoo Committee for repositioning the speedometer on the control desk of meter gauge diesel locomotive or alternatively, providing another speedometer so that the driver can refer to it conveniently, has been implemented on some Railways, it remains to be fully implemented on the Northern, Western and Southern Railways in

spite of Railway Board's clear directive on the subject nine years ago.

(Paras 447 to 450)

130 On the question of maintenance of speedometers, our review has shown that this is a clear case where things have been allowed to drift and although ten years have elapsed since the recommendation, no appreciable headway has been made either in the manufacture of a suitable speedometer/speed-recorder or in the proper maintenance of the instruments which are presently in use. Thus, this recommendation of the Wanchoo Committee remains unimplemented. We hope that the Railway Board will now expedite the action proposed by them in this regard.

(Paras 451 to 457)

131 We find that even though the provision of Drivers Vigilance Control Device on diesel and electric locomotives had been accepted as a policy by the Railway Board, a decade has elapsed and satisfactory design of Vigilance Control Device for electric locomotives, suitable for Indian conditions, is still to be developed. While some diesel locomotives have been equipped with this safety device, none of the electric locomotives has been provided with the same. Even where this device has been. provided on diesel locomotives, in many

cases it is found to be not in working order. Thus, an important safety measure remains substantially unimplemented. We are concerned that it has also so far not been possible to get the drivers to accept the utility of this device, in spite of the fact that the study made by the RDSO had shown that its operation did not generate fatigue and exhaustion in drivers to any significant extent which is likely to impair efficiency. We would urge the Railway Board to take urgent steps to equip all diesel and electric locomotives with Drivers' Vigilance Control Device at the earliest, if necessary, by resorting to imports till a successful indigenous design becomes available. It is also necessary that full cooperation of the drivers is ensured by better educational propaganda and more frequent personal contacts.

(Paras 458 to 464)

132 There has been a gradual decrease in the holdings of steam locomotives due to progressive dieselization and electrification during the last 15 years. In this background and with the steps taken by the Railway Board to give special attention to the maintenance of overaged locomotives, perhaps a reduction in the time interval between two overhauls may not be necessary. **(Paras 465 to 468)**

GOODS AND COACHING STOCK

133 The recommendations made by the Kunzru and Wanchoo Committees for adoption of a uniform basis for fixing the time schedule for train examination and for determining the strength of examining gangs remain unimplemented. This is a vital affecting the safety of train operation and urge the. Railway Board to take a decision expeditiously and implement the recommendations as early as possible.

(Paras 471 to 475)

134 We find that it has not been possible to implement the recommendation of the Wanchoo Committee Tot adopting the Andal pattern of 'train examination due to various difficulties experienced by the Railways.

(Paras 476 to 479)

135 The position of repairs to wagons in traffic yards and on trains is not .entirely satisfactory. It is undesirable that wagons with rejectable defects should continue: to remain in service though not permitted under the Conference Rules, Part III. We would impress upon the Railway Board to take steps and ensure that repairs to wagons on nominated lines and on trains in traffic yards are carried out satisfactorily.

(Paras 480 to 485)

136 We find that whereas the Northeast Frontier Railway has indicated that machinery and tools in sicklines are provided on the basis of the Railway Board's instructions issued in 1954, all the other Railways have stated that the sicklines are being equipped as per standards recommended by the Committee appointed by the Railway Board in December, 1971. The Railways have also indicated the nonavailability of certain types of equipment in the sicklines. We also find that ultrasonic equipment is not included in the standard lists of equipment prescribed either in 1954 or in 1971. Thus, the sicklines on the Railways are still not equipped fully with the requisite type of machinery and plant. The Railway Board should take urgent steps in this respect. **(Paras 486 to 490)**

137 The system of neutral control examination of wagons is in force at 59 broad gauge and 19 meter gauge sicklines where wagons are turned out after obtaining neutral control fit certificates. From the results of checks made by the neutral control staff, we find that during 1976-77, 5.3 and 8.2 per cent of the wagons on broad gauge and meter gauge respectively, were found with rejectable defects at the time of final examination in sicklines. It is disquieting that even

rejectable defects are not being fully attended to in sicklines.

We also find that wagons are being turned out of sicklines without neutral control fit certificates, thus evading neutral control examination. IRCA reports have been consistently highlighting the particularly poor performance of sicklines at Rewari, Garhara, Gonda, Lumding, Katihar, Siliguri, Tinsukia, New Gauhati, Samastipur and Guntakal where the repair procedures were found generally sub-standard. Thus, even where the system of neutral control examination of wagons is in force, a substantial percentage of wagons is turned out without fit certification by the neutral control staff. This, in our opinion, is a serious matter which the Railway Board should go into and ensure that no wagon is turned out without fit certification by neutral control staff in sicklines, where examination by such staff is in force.

It is clear that the recommendations of the Wanchoo Committee have not been implemented in any substantial measure. The Railway Board should take firm steps to see that wagons are turned out after completion of all stipulated repairs.

(Paras 492 to 498)

138 We are concerned that primary and secondary maintenance of some passenger carrying rakes is still carried out on lines with high level platform on one side. We strongly Teel that the practice of giving primary and secondary maintenance to coaching rakes on platform lines should stop forthwith and adequate facilities should be created at the stations to undertake the statutory maintenance schedules as prescribed in the Conference Rules Part IV.

(Paras 499 to 502)

139 Having accepted the Wanchoo Committee's recommendation, the Railway Board issued orders in 1969 that the practice of clamping and securing broken bearing springs on BOX wagons should be discontinued. We find that these orders are not being complied with by the Railways.

(Paras 503 to 505)

140 Large-scale overloading of BOX wagons, up to the extent of 8 to 10 tonnes, is a common feature at certain coal loading depots on the Eastern Railway. In some cases it was as high as 18 tonnes. It appears to us that this cannot happen except with the connivence on the part of some personnel on the Railways and the loading parties. Thus, the dangerous practice of overloading of BOX wagons not only

continues unabated but has aggravated in the last decade. **(Paras 506 to 510)**

141 It is a serious matter that in spite of strong objections by the RDSO and the Commission of Railway Safety, the practice of overloading BOX wagons as a regular measure to the extent of 2 tonnes over and above the carrying capacity has been allowed to continue. Further, higher axle loads on BOX wagons are being permitted in contravention of the Conference Rules, Part M. We are of the view that the Railway Board's directive permitting overloading beyond the carrying capacity by 2 tonnes, as a regular measure, would seriously affect safety and feel that this needs to be reviewed urgently at the highest level, in consultation with the RDSO and the Commission of Railway Safety.

(Paras 511 to 518)

142 In the case of coaching stock on the broad and meter gauges, after a rise in the incidence of hot boxes during 1974-75 and 1975-76, there has been a steady fall in the last two years of our survey. During 1977-78 the all-Railways average incidence of hot boxes on coaching stock per 10 million vehicle kilometers was 0.43 on broad gauge and 1.94 on meter gauge as against - the Railway Board's target of 1.0 on both gauges. On the broad gauge of

Northern, South Central and South-Eastern Railways there has been an increase in the incidence of hot boxes on coaching stock during 1977-78 as compared to the previous year; on the meter gauge, none of the Railways were able to achieve the target of the Railway Board during 1977-78; on the other hand, the incidence of hot boxes had gone up on the Southern, South Central and Western Railways as compared to the position obtaining in the previous year. We would urge these Railways to take necessary steps so as to bring down the incidence of hot boxes.

(Paras 519 to 522)

143 We The overall incidence Of hot boxes on goods stock per million wagon kilometers on the broad gauge has been steadily falling except during 1977-78 when there was a slight increase on some Railways as compared to the previous year, though within the target.

On the meter gauge, there has been a decline in the incidence of hot boxes on goods stock except for two intervening years 1974-75 and 197576 when there was an increase. Except the Southern and South Central Railways, no other Railway could keep within the target of 0.5 hotboxes per million wagon kilometers stipulated by the Railway Board. The Northern, North-Eastern,

Northeast Frontier and Western Railways should take effective steps to bring down the incidence of hot boxes on meter gauge goods stock within the target stipulated by the Railway Board. **(Paras 523 to 525)**

144 We find that the principal causes of hot boxes on coaching and goods stock on both the broad and meter gauges continue to be the same as found by the Kunzru and Wanchoo Committees, namely, dry packing, badly fitted brasses, uneven loading or overloading water or dirt contaminated packing, badly metalled brass, etc. These areas of maintenance of rolling stock, therefore, call for greater attention.

(Para 526)

145 We may point out that due to the increasing number of coaches and wagons fitted with roller bearings which are being put into service on the Railways, the overall incidence of hot boxes in relation to vehicle/ wagon kilometers is bound to come. down. We would, therefore, caution the Railways against complacency in this regard and urge that steps should continue for bringing down further the incidence of hot boxes on coaching stock and wagons on both broad and meter gauges. Also, the targets may need to be appropriately revised.

(Para 527)

146 We are sorry to note that though more than a decade has elapsed, an indigenously developed hot box detector appears now where in sight. With the trend towards long-distance and high-speed trains the need for detecting hot boxes in time cannot be over-emphasized.

(Paras 528 and 529)

147 Checks on effective brake power by neutral control staff had shown that only 12 per cent of the originating trains and 1 per cent of the terminating trains had effective brake power of 85 per cent and above. We cannot escape the conclusion that most of the trains leave originating points with effective brake power much less than the prescribed minimum and the position becomes worse on the run. These results belie the claims made by most of the Zonal Railways that the prescribed brake power is available on all goods trains. The Railway Board's own directive in this regard is, thus, not being followed and the recommendation of the Wanchoo Committee remains unimplemented. The safety of a train is endangered when its brake power is poor and it must be ensured that trains leave the originating points with atleast the minimum stipulated effective brake power.

(Paras 530 to 536)

148 In a number of cases the trains were started without recording on the certificate the vaccum available in the engine or the brake van. In some cases fictitious readings of vacuum in the brake van were recorded. We consider absence of vacuum gauges in the rear brake vans and incorrect preparation of brake power certificates to be highly disconcerting features. We would stress that effective measures should be taken to ensure that vacuum gauges are invariably fixed in the rear brake vans and that they are in working order and the brake power certificates are correctly prepared. **(Paras 538 to 540)**

149 In respect of the Wanchoo Committee's recommendation that a satisfactory solution should be evolved to overcome the difficulty of stopping diesel-hauled goods trains, the Railway Board had stated that detailed tests have shown that no modification was required in the brake circuitry of the diesel locomotives. The Railway Board, therefore, felt that this recommendation did not call for any further action.

(Paras 541 to 548)

150 The Wanchoo Committee's recommendation to give

identifying marks on all anti-telescopic coaches has been fully implemented. In the course of our examination, it has also come out that even the extant instructions of the Railway Board of marshalling passenger trains are not always followed. The Railway Board should ensure that passenger trains are run with the stipulated marshalling order of coaches.

(Paras 549 to 552)

151 We find that all 4-wheeler brake vans on broad and meter gauges have not, so far, been equipped with modified spring arrangements although the instructions to do this were issued more than 8 years ago.

(Paras 553 & 554)

152 The backlog of POH of coaching vehicles on the broad gauge was comparatively higher on the Eastern, Northern, Southern, South Central and South-Eastern Railways. On the meter gauge, the backlog of POH of coaching vehicles on the Northern. Southern and South-Central Railways was considerably higher than the all-Railways average.

(Paras 555 to 559)

153 On the broad gauge, the percentage of wagons overdue

POH on the Central, Northern and Western Railways were higher than the all-Railways average. On the meter gauge, the percentage of the wagons overdue POH on the Northern and South-Central Railways was considerably higher than the all-Railways average. These Railway Administrations should take steps to bring down. The arrears in POH of wagons.

(Paras 560 to 563)

154 In the face of continuing arrears in POH of wagons on almost all the Railways, the Railway Board have surprisingly issued instructions to the Railway Administrations to temporarily advance POH of wagons by 6 months so as to enable adequate supply of wagons to workshops for POH to avoid under-utilization of the available POH capacity. In our opinion, such a step can be justified only after POH arrears have been fully liquidated on all the Railways. If spare POH capacity is available on some Railways, it should first be utilized for clearing the arrears on other Railways to the extent possible.

(Para 565)

155 We find that during 1977 the rate of failures of spherical roller bearings on ICF broad and meter gauge coaches increased to 3.25 per cent and of

cylindrical roller bearings on BEML broad gauge coaches the rate of failures was 0.531 per cent. The incidence of failures of roller bearings on BOX wagons had also gone up to 0.75 and 1.06 per cent during 1976 and 1977 respectively as compared to 0.05 per cent during the period 1966-67 to 1968-69.

We feel that the maintenance of roller bearings has not received the attention that it deserves thereby resulting in increase in the rate of failures of roller bearings and deterioration in position since the appointment of the Wanchoo Committee. The Railway Board should take effective steps in this matter.

(Paras 566 to 576)

156 Dust-proof rooms for overhauling of roller bearings still remain tot be provided in workshops on some Railways. The Railway Board should ensure that these facilities are provided without delay.

(Paras 577 and 578)

157 The Railway Board had not accepted the suggestion of the Wanchoo Committee for adopting a system similar to that on the Japanese National Railways for attention to roller bearings in workshops. Considering that there has been

an appreciable increase in the rate of failures of roller bearings on the Indian Railways during the last decade, an in-depth study of the extant maintenance practices is called for. **(Para 579)**

158 We find that hot box detector is still under development. In the wake of increasing use of roller bearings and the introduction of more and more fast non-stop trains, it would be desirable to develop a hot box detector device at the earliest.

(Paras 580 to 582)

159 Neutral control examination of coaches after POH in workshops is in force only at 17 out of total of 31 workshops where repairs to coaching stock are undertaken. The results of checks made by neutral control staff during 1978 show that the percentage of coaches detained due to non-completion of repairs at the time of outgoing inspection was still high in the case of some workshops. As compared to the position in 1978, there has been some deterioration in the case of certain broad-gauge workshops. The Wanchoo Committee's recommendations, thus, remain unimplemented. The Railways must take effective steps to improve the quality of workmanship in the workshops and bring

down the rejections at the stage of final examination by neutral control staff.

(Paras 583 to 586)

160 The percentage of coaches sent out of workshops without obtaining neutral control fit certificates was quite high in some workshops. It is disquieting that in the case of broad-gauge workshops at Matunga on the Central Railway, Kharagpur on the South-Eastern Railway and meter gauge workshops at Gorakhpur on the North-Eastern Railway, New Bongaigaon on the Northeast Frontier Railway, the number of coaches passed locally -without obtaining neutral control fit certificates had increased during 1978 as compared to 1970.

(Paras 587 and 588)

161 We also find that in some workshops where the percentage of coaches detained by neutural control staff due to non-completion of repairs Was high, the percentage of coaches passed without-obtaining neutral control fit certificates was also high. The workshops at Matunga (CR), Alambagh, Lallaguda, Kharagpur on the broad gauge and Gorakhpur and New Bongaigaon on the meter gauge stand out glaringly in this respect. The Railway Board should look into this and take urgent corrective action. **(Para 589)**

162 The maintenance of rolling stock has shown signs of deterioration in recent years. In the interest of safety of train operation, it is necessary that every effort should be made to improve the condition of rolling stock. Extension of the neutral control examination would appear to be an effective means to ensure this. The Railway Board are already seized of this matter, and we would stress the need for an expeditious decision.

(Paras 590 to 594)

163 The performance reckoned in terms of the percentage of wagon units with unattended rejectable defects by which the Railway Board indicated an improvement in 1967-68, has slipped back to the level obtaining in 1963-64. It is also clear that the high percentage of wagons found with rejectable defects has been persisting over these years on all the Railways.

(Paras 593 to 598)

164 Spot checks conducted by neutral control flying squads during the period 1974-75 to 1976-77 show that a large number of wagons with `rejectable defects having a direct bearing on safety', were left unattended on the broad and meter gauges. It is a matter of concern that even after the

wagons have been attended to by railway staff, a very high percentage of these remained with such defects. The spot checks, though limited in nature, show that a large number of wagons are running with such defects. This reveals a serious state of affairs and calls for urgent corrective action. **(Paras 599 and 600)**

165 The figures in respect of overaged coaches and wagons show that there has been reduction in their number on both the broad and meter gauges.

From the age-wise information of the overaged coaches furnished by the Railways, we find that a substantial percentage of the overaged coaches has exceeded the codal life by as much as 20 years on the broad and meter gauges. We hope that priority will be given to replacing these overaged coaches.

(Paras 602 to 606)

MISCELLANEOUS MATTERS AND RESEARCH, DESIGNS AND STANDARDS ORGANISATION

166 We find that double ended sidings for stabling of medical vans have not been provided at 12 stations on the Railways. The question of providing such sidings has been with the Railways for more than 15 years. We find no justification for

the failure to implement this accepted recommendation. **(Paras 607 to 610)**

167 Narrow gauge lines are still being worked with increasing preponderance of overaged locomotives and rolling stock; there are also heavy arrears of track renewals. We consider that to continue to work them under these conditions is hazardous. They must, therefore, either be closed down or fully rehabilitated. The Government should take an early decision in the matter. **(Paras 611 to 615)**

168 We note that at present only a skeleton documentation section is functioning in the RDSO and expansion of the scheme has been deferred due to financial stringency. Thus, the recommendation of the Wanchoo Committee remains unimplemented. We feel strongly that the absence of a well-equipped and modern documentation section is a severe handicap to any research organization, more so to the only such institution in the Railways. Economy in this can only hamper the effectiveness of the research organization and hence prove to be self-defeating.

(Paras 616 to 619)

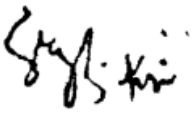
169 Operations research has not, so far, been employed by the Railways to improve the standard of safety as

was envisaged by the Wanchoo Committee. This recommendation, therefore, remains unimplemented. We feel that operations research will be a useful tool to improve the standard of safety in train operation and urge the Railway Board to take effective steps in this direction. The setting up of Operations Research Cells on the Railways will be a step in the right direction and should be expedited.

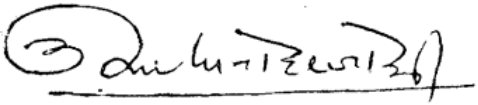
(Paras 620 to 626)

170 In our view the setting up of a vehicle dynamics test-rig and the laying of a test-track are essential to evaluate the performance of various design concepts to the limits of their operating capabilities under controlled and simulated conditions. We would impress upon the Railway Board the need to give priority to the setting up of these facilities at the earliest.

(Paras 627 to 630)



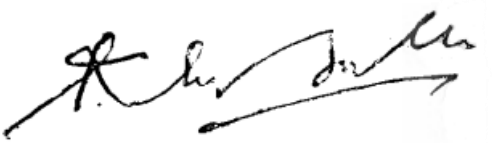
(S.M. SIKRI)
Chairman



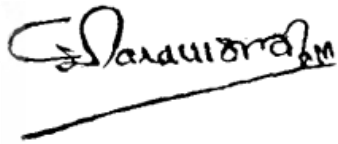
(DR. MURLI MANIHAR JOSHI)
M.P.
Member



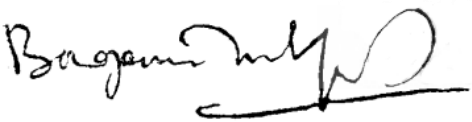
(P. SAHAI)
Member



(KHURSHID ALAM KHAN) M.P.
Member



(C.S. PARAMESHWARAN)
Member



(BAGARAM TUIPULE)
Member



(ARYA BHUSHAN)
Member



(R.S. SOIN)
Secretary

NEW DELHI
18th July, 1979

ANNEXURE I

Incidence of Accidents falling in Groups I, II and III

A- Number of accidents, B- Incidence per million train kilometers.

Year	Important accidents		Failure of railway equipment		Miscellaneous			
	Group I		Group II		Group III		Total accidents	
	A	B	A	B	A	B	A	B
1963-64	1642	3.9	4176	10.1	1617	3.9	7435	17.9
1964-65	1279	3.0	3602	8.5	1570	3.7	6451	15.2
1965-66	1200	2.7	3348	7.6	1468	3.3	6016	13.6
1966-67	1090	2.5	3225	7.3	1567	3.5	5882	13.3
1967-68	1105	2.5	2997	6.7	1394	3.1	5496	12.3
1968-69	908	2.0	2859	6.2	1266	2.7	5033	10.9
1969-70	963	2.0	2817	6.0	1253	2.6	5033	10.6
1970-71	840	1.8	3062	6.6	1016	2.2	4918	10.6
1971-72	864	1.8	3043	6.4	1052	2.2	4959	10.4
1972-73	813	1.7	5185	11.0	1179	2.5	7177	15.2
1973-74	782	1.8	6082	14.1	1206	2.8	8070	18.7
1974-75	925	2.2	8499	19.8	1301	3.0	10725	25.0
1975-76	964	2.0	9765	20.1	1071	2.2	11800	24.3
1976-77	780	1.5	7856	15.4	907	1.8	9543	18.7
1977-78	866	1.6	9256	17.6	867	1.7	10989	20.9

Note: Figures of Group I accidents for the period 1963-64 to 1967-68 have been extracted from Part I Report of the Wanchoo Committee.

ANNEXURE II

Number of important Accidents- Category wise

Year	Collisions	Derailments	Accidents to trains at level crossings	Fires in trains	Total
1963-64	86	1277	164	115	1642
1964-65	86	1028	133	32	1279
1965-66	79	951	128	42	1200
1966-67	68	865	104	53	1090
1967-68	70	879	114	42	1105
1968-69	47	684	129	48	908
1969-70	54	751	111	47	963
1970-71	59	648	121	12	840
1971-72	57	667	118	22	864
1972-73	59	598	131	25	813
1973-74	66	578	125	13	782
1974-75	66	696	140	23	925
1975-76	64	768	105	27	964
1976-77	45	633	86	16	780
1977-78	54	705	93	14	866

Note: Figures of important accidents for the period 1963-64 to 1967-68 have been extracted from Part I Report of the Wanchoo Committee.

ANNEXURE III

Serious Accidents-Cause-wise Analysis

A=Total number of accidents, B= 'A' taken as a percentage of the total number of accidents during the period.

S. No.	Causes	Period I		Period II		Period III		Period IV	
		A	B	A	B	A	B	A	B
1	Failures of Drivers (Drivers disregarding signals or running at excessive speeds or violating safety rules)	22	29.7	21	26.6	31	36.4	34	29.8
2	Failure of station staff (station staff responsible for incorrect setting of points or receiving/dispatching trains on blocked lines or sections)	18	24.3	13*	16.5	3	3.5	15	13.2
3	Accidents caused by wilful tampering with track or other acts of sabotage e.g. blowing up of tracks/bridges or vehicles	12	16.2	17	21.6	10	11.8	6	5.3
4	Accidents at road level crossings:					1			
	(i) Caused by failure of railway staff	1	1.4	Nil	..	2	1.2	Nil	..
	(ii) Caused by road users	3	4.1	5	6.3	1	2.3	9	7.9
5	Failure of engines	2	2.7	1	1.3	8	1.2	3	2.6
6	Failure of rolling stock	3	4.0	2	2.5		9.4	10	8.8
7	Failure of track	4	5.4	3	3.8	5	5.9	8	7.0

8	Fires in trains	2	2.7	3	3.8	10	11.8	12	10.5
9	Rash acts of travelling public or outsiders	2	2.7	3	3.8	5	5.9	1	0.9
10	Accidents caused by natural calamities e.g. unprecedented floods, tidal waves. Etc.	Nil	..	3	3.8	1	1.2	2*	1.7
11	Explosions in trains not caused with the intention of sabotage	Nil	..	2	2.5	1	1.2	Nil	..
12	Miscellaneous	5	6.8	4	5.0	7	8.2	9	7.9
13	Cause could not be determined by the Additional Commissioner of Railway Safety	Nil	..	2	2.5	Nil	..	4	3.5
14	Cause under consideration	Nil	..	Nil	..	Nil	..	1	0.9
		74	100.0	79	100.0	85	100.0	114	100.0

Note: 1. *One accident was enquired into by Commission of Inquiry.

5. Figures of number of accidents shown under column A of period IV do not include 20 serious accidents of the type mentioned in paragraph 49. The cause-wise breakup of these accidents is as under: -

S. No.	Cause	Number
(i)	Failure of drivers	3
(ii)	Failure of station staff	1
(iii)	Accidents at level crossings due to-	
	(a) Failure of railway staff	13
	(b) Failure of road users	2
(iv)	Failure of rolling stock	1
	Total	**20**

ANNEXURE

Casualties and Loss due to Damage to A- Number of casualties, B- 'A' taken as a percentage of total casualties

S. No.	Cause	1957-62 Period I						1963-64 to 1967-68 Period II			
		Casualties				Loss due to damage		Casualties			
		Killed		Injured		Rupees in thousands		Killed		Injured	
		A	B	A	B	A	B	A	B	A	B
1	Drivers disregarding signals or running at excessive speeds or violating safety rules	100	31.9	633	35.2	940	25.8	114	15.4	505	22.2
2	Station staff responsible for incorrect setting of points or receiving/ despatching trains on blocked lines or sections.	66	21.2	420	23.3	710	19.5	126	17.1	635	28.0
3	Accidents caused by willful tampering with track	103	32.9	578	32.0	1580	43.3	210	28.4	618	27.2
4	Accidents at road level crossings	4	1.2	27	1.5	29	0.8	10	1.3	54	2.4
5	Total of items 1 to 4	273	87.2	1658	92.0	3259	89.4	460	62.2	1812	79.8

6	Defects in engines										
7	Failure of rolling stock										
8	Failure of track										
9	Fires in trains	The Wanchoo Committee Report gives the figures of total casualties and loss due to damage which occurred in accidents due to causes as indicated against items 6 to 15, which has been given against itern 16 for ready comparison.									
10	Rash acts of travelling public or outsiders										
11	Accidents caused by natural calamities e.g. unprecedent- ed floods, tidal waves etc..										
12	Explosions in trains not caused with the intention of sabotage.										
13	Miscellaneous causes										
14	Cause could not be determined by the ACRS										
15	Cause under consideration										
16	Total of items 6 to 15	39	12.8	144	8.0	388	10.6	279	37.8	459	20.2
17	Total of items 5 and 16	312	100.0	1802	100.0	3764	100.0	739	100.0	2271	100.0

Note:- Figures given under Period IV do not include casualties and loss due to damage 49 in Chapter III

IV

Railway Property in Serious Accidents.
Loss due to damage
Loss due to damage during the period

		1968-69 to 1972-73 Period III						1973-74 to 1977-78 Period IV					
Loss due to damage		Casualties				Loss due to damage		Casualties					
Rupees in thousands		Killed		Injured		Rupees in thousands		Killed		Injured		Rupees in thousands	
A	B	A	B	A	B	A	B	A	B	A	B	A	B
2361	24.4	123	27.6	810	47.0	9438	68.5	184	32.7	748	45.8	5591	18.5
2743	28.4	104	23.3	138	8.0	761	5.5	49	8.7	188	11.5	1844	6.1
1898	19.6	104	23.3	308	17.8	2171	15.8	27	4.8	56	3.4	4596	15.2
13	0.2	2	0.4	81	4.7	4	0.03	11	2.0	45	2.8	121	0.4
7015	72.6	333	74.6	1337	77.5	12374	89.8	271	48.2	1037	63.5	12152	40.2
		Nil	-	1	0.1	43	0.3	4	0.7	30	1.9	526	1.8
		10	2.3	55	3.2	339	2.4	21	3.7	67	4.1	1316	4.4
		5	1.1	23	1.3	203	1.5	2	0.4	48	2.9	1005	3.3
		45	10.1	101	5.8	645	4.6	92	16.4	75	4.6	2203	7.3
		40	9.0	54	3.1	21	0.2	1	0.2	6	0.4	Nil	-
		Nil	-	3	0.2	3	0.02	87	15.5	118	7.2	1164	3.9

		4	0.9	19	1.1	8	0.1	Nil	-	Nil	-	Nil	-
		9	2.0	132	7.7	150	1.1	17	3.0	62	3.8	1399	4.6
		Nil	-	Nil	-	Nil	-	10	1.8	90	5.5	2999	9.9
		Nil	-	Nil	-	Nil	-	57	10.1	100	6.1	7423	24.6
2644	27.4	113	25.4	388	22.5	1412	10.2	291	51.8	596	36.5	18035	59.8
9659	100.0	446	100.0	1725	100.0	562	100.0	562	100.0	1633	100.0	30187	100.0

Which took place in 17 and 20 serious accidents of the types mentioned in paragraphs 46 and due to mismanagement by Engine Crew.

V

A- Total number of Engine Failures
B- Number of Engine Failures due to Mismanagement by Engine Crew
C- Percentage (B)/(A) x 100

SR			SCR			SER			WR			Grand Total		
A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
133	22	16.5	100	28	28.0	113	33	29.2	118	27	22.9	670	176	26.3
178	27	15.2	92	19	20.7	111	33	29.7	102	36	35.3	835	168	20.1
118	16	13.6	90	16	17.8	132	37	28.0	129	48	37.2	849	207	24.3
99	16	16.2	114	22	19.3	125	49	39.2	124	61	49.2	1129	295	26.1
86	12	14.0	112	20	17.9	159	41	25.8	141	40	28.4	1318	294	22.3
614	93	15.2	508	105	20.7	640	193	30.2	614	212	34.5	4801	1140	23.8
82	21	24.4	109	25	22.9	130	32	24.6	183	53	29.0	1967	404	20.5
80	12	15.0	79	9	11.4	363	120	33.1	175	52	29.7	2416	555	23.0

106	19	17.9	101	7	6.9	296	76	25.7	164	53	32.3	1921	439	22.9
98	154	14.3	78	12	15.4	183	31	16.9	164	20	12.2	1192	204	17.1
97	14	14.4	80	10	12.5	416	99	23.8	82	19	23.2	1438	287	20.0
463	80	17.3	447	63	14.1	1388	358	25.8	768	197	25.7	8934	1889	21.1

Failure of Meter Gauge Steam Locomotives

Railway Year	**CR**			**NR**			**NER**			**NFR**		
	A	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
1968-69	7	3	42.8	1	1	100.0	182	47	25.8	135	32	23.7
1969-70	36	10	27.8	1	1	100.0	156	40	25.6	99	15	15.2
1970-71	62	19	30.6	1	1	100.0	164	37	22.6	128	34	26.6
1971-72	35	8	22.9	39	11	28.2	125	23	18.4	205	42	20.5
1972-73	29	4	13.8	92	23	25.0	202	20	9.9	162	17	10.5
Total for 5 years	**169**	**44**	**26.0**	**134**	**37**	**27.6**	**829**	**167**	**20.1**	**729**	**140**	**19.2**
1973-74	19	6	31.6	456	69	15.1	275	30	10.9	206	25	12.1
1974-75	28	4	14.3	339	42	12.4	448	51	11.4	350	45	12.9
1975-76	23	4	17.4	317	48	15.1	535	64	12.0	299	36	12.0
1976-77	22	1	4.5	91	18	19.8	349	33	9.5	96	15	15.6
1977-78	26	9	34.6	22	3	13.6	334	26	7.8	103	14	13.6
Total for 5 years	**118**	**24**	**20.3**	**22**	**180**	**14.7**	**194**	**204**	**10.5**	**1054**	**135**	**12.8**

VI

Due to Mismanagement by Engine Crew

A- Total Number of Engine Failures.
B- Number of Engine Failures due to Mismanagement by Engine Crew.
C- Percentage-(B)/(A) x 100

SR			SCR			WR			Grand Total		
A	B	C	A	B	C	A	B	C	A	B	C
139	29	20.9	76	19	25.0	129	31	24.0	669	162	24.2
143	26	18.2	87	26	29.9	110	36	32.7	632	154	24.4
261	52	19.9	91	19	20.9	104	41	39.4	811	203	25.0
128	23	18.0	91	16	17.6	129	42	32.6	752	165	21.9
90	11	12.2	57	16	28.1	110	28	25.5	742	119	16.0
761	141	18.5	402	96	23.9	582	178	30.6	3606	803	22.3
95	6	6.3	46	10	21.7	138	49	35.5	1235	195	15.8
38	10	26.3	66	14	21.2	211	67	31.8	1480	233	15.7
86	17	19.8	74	10	13.5	280	87	31.1	1614	266	16.5
62	10	16.1	61	4	6.6	149	32	21.5	830	113	13.6
74	14	18.9	70	7	10.0	185	46	24.9	814	119	14.6
355	57	16.1	317	45	14.2	963	281	29.2	5973	926	15.5

ANNEXURE- VII

The incidence of more than 10 hours of running duty at a stretch of Steam, Diesel and Electric Locomotives Drivers during 1977-78 on the Indian Railways

	Driver Grade	Total number of trips	Trips with running day							
Railways			**10 to 12 hours**		**12 to 14 hours**		**14 to 20 hours**		**More than 20 hours**	
			Number	**Percentage**	**Number**	**Percentage**	**Number**	**Percentage**	**Number**	**Percentage**
Central	A+B	Nil	Nil	-	Nil	-	Nil	-	Nil	-
	C	326431	49178	15.1	27791	8.5	25620	7.8	3162	1.0
Eastern	A+B	Nil	-	-	-	-	-	-	-	-
	C	113379	13569	12.0	7101	6.3	3490	3.1	5	0.004
Northern	A+B									
	C	Information not furnished								
North-Eastern	A+B	Information not furnished								
	C	103555	17250	16.7	9869	9.5	6990	6.7	1190	1.1
Northeast Frontier	A+B	77014	Nil	-	Nil	-	Nil	-	Nil	-
	C	97617	9957	10.2	5478	5.6	Nil	-	Nil	-
Southern	A+B	180997	792	0.4	128		30	0.1	4	0.002
	C	190075	15765	8.3	7947	4.2	2836	1.5	8	0.004
Soth Central	A+B	-	Nil	-	Nil	-	Nil	-	Nil	-

	C	211583	26741	12.6	14294	6.4	10371	4.9	1824	0.9
South-Eastern	A+B	Information not furnished								
	C									
Western	A+B	-	Nil	-	Nil	-	Nil	-	Nil	-
	C	327306	29934	9.1	18103	5.6	6359	1.9	63	0.02

ANNEXURE

Failure of Broad-Gauge Steam Locomotives

Railway	**CR**			**ER**			**NR**			**NER**			**FR**		
Year	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
1968-69	189	58	30.7	..	..	..	..	..	..	..	..	..	17	8	47.1
1969-70	162	43	26.5	..	..	..	..	..	..	..	..	..	54	10	18.5
1970-71	157	42	26.8	184	40	21.7	..	..	..	..	..	..	39	8	20.5
1971-72	128	29	22.7	210	42	20.0	285	63	22.1	..	..	..	44	13	29.5
1972-73	126	35	27.8	285	60	21.1	387	81	20.9	..	..	..	22	5	22.7
Total for 5 years	762	207	27.2	679	142	20.9	672	144	21.4	..	..	..	176	44	25.0
1973-74	184	29	15.8	464	92	19.8	772	145	18.8	..	..	..	43	7	16.3
1974-75	284	52	18.3	569	124	21.8	677	143	21.1	..	..	..	189	43	22.8
1975-76	228	47	20.6	404	96	23.8	413	96	23.2	..	..	..	209	45	21.5
1976-77	135	32	23.7	223	34	15.2	293	57	19.5	4	1	25.0	14	3	21.4
1977-78	170	24	14.1	287	52	18.1	273	59	21.6	8	1	12.5	25	9	36.0
Total for 5 years	1001	184	18.4	1947	398	20.4	2428	500	20.6	12	2	16.7	480	107	22.3

ANNEXURE VIII

Shortage in Different Categories of Staff as Existing on 31-3-1968 and 31-3-1978

Category & Railway	As on 31-3-1968			As on 31-3-1978		
	Sanctioned Strength	**Vacancies**	**Percentage**	**Sanctioned Strength**	**Vacancies**	**Percentage**
Station Masters and Assistant Station Masters						
Central	3060	24	0.78	3713	129	3.47
Eastern	3005	23	0.76	3130	89	2.84
Northern	4547	74	1.6	4607	178	3.9
North-Eastern	2196	9	0.4	2387	56	2.3
Northeast Frontier	2169	42	1.93	2049	85	4.14
Southern	4026	148	3.67	2971	183	6.15
Soth Central	2844	47	1.65	3045	154	5.05
South-Eastern	3085	..	..	3257	51	1.5
Western	4170	35	0.8	4643	312	6.71
All Railways	**29102**	**402**	**1.38**	**29802**	**1237**	**4.15**
Switchmen						
Central				821	22	0.2
Eastern				1831	10	0.5
Northern	Negligible shortage.			1192	13	0.1
North-Eastern	There were only 22 vacancies					

Northeast Frontier	On all the Railways cut of sanctioned strength of 5197			This Category of staff does not exist.		
Southern				627	18	2.9
Soth Central				636	11	1.7
South-Eastern				1874	38	2.0
Western				495	3	0.60
				7476	115	1.53
Cabinmen						
Central	876	1	0.1	1715	30	1.74
Eastern	567	Nil	Nil	160	Nil	Nil
Northern	1960	5	0.2	1687	11	0.7
North-Eastern	764	8	1.0	990	21	2.1
Northeast Frontier	814	20	2.1	1315	74	5.62
Southern	1585	40	2.5	1396	48	3.43
Soth Central	1118	16	1.4	1241	37	2.98
South-Eastern	474	10	2.0			
Western	538	61	11.4	949	40	4.21
All Railways	**8696**	**161**	**1.8**	**9453**	**261**	**2.76**
Levermen and pointsmen						
Central	8235	143	1.7	7346	117	1.6
Eastern	3037	4	0.1	3450	66	1.9
Northern	4908	27	0.6	5566	69	1.2
North-Eastern	2971	23	0.8	2926	10	0.3
Northeast	3247	26	0.8	3428	201	5.9

Frontier						
Southern	4172	834	20.00	2810	159	5.7
Soth Central	4341	163	3.7	2790	147	5.3
South-Eastern	5010	-	-	Information not furnished		
Western	7337	69	0.94	7030	98	1.39
All Railways	**43258**	**1289**	**2.9**	**35346**	**867**	**2.45**
Shunting Jamadars/Gunners/Shunting Masters and Shuntmen						
Central	355	13	3.6	200	17	8.5
Eastern	3813	133	3.2	671	43	6.4
Northern	3608	37	1.0	698	9	1.3
North-Eastern	524	19	3.6	255	Nil	Nil
Northeast Frontier	853	48	5.6	250	47	18.8
Southern	707	12	1.7	382	6	1.6
Soth Central	1333	21	1.5	412	35	8.5
South-Eastern	1854	13	0.7	1258	41	3.3
Western	479	6	1.2	553	44	7.95
All Railways	**13526**	**302**	**2.2**	**4679**	**242**	**5.17**
Guards						
Central	1960	15	0.8	2814	103	3.7
Eastern	1477	13	0.8	2435	27	1.1
Northern	1573	50	3.1	Information not furnished		
North-Eastern	790	6	0.8	1249	3	0.2
Northeast Frontier	741	7	0.9	925	21	2.3

Southern	809	7	0.9	1638	45	2.7
Soth Central	1053	15	1.4	1696	60	3.5
South-Eastern	1979	44	2.0	2450	72	2.9
Western	1436	11	0.8	2487	81	3.25
All Railways	**11818**	**168**	**1.4**	**15694**	**412**	**2.62**
Drivers						
Central	2143	126	5.8	4699	339	7.2
Eastern	2235	141	6.3	4621	9	0.2
Northern	2741	19	0.69	5179	142	5.0
North-Eastern	1368	55	4.0	2522	10	0.4
Northeast Frontier	1030	23	2.2	1749	Nil	Nil
Southern	1611	57	3.5	2506	184	7.3
Soth Central	1452	73	5.0	2857	187	6.5
South-Eastern	2144	13	0.6	3140	14	0.4
Western	2214	12	0.6	4645	54	1.16
All Railways	**16938**	**519**	**3.0**	**37918**	**939**	**2.94**
Firemen						
Central	**4788**	**44**	**0.9**	**4360**	**98**	**2.3**
Eastern	**5038**	**48**	**0.9**	**5495**	**Nil**	**Nil**
Northern	**7508**	**89**	**1.0**	**5711**	**105**	**1.8**
North-Eastern	**2927**	**132**	**4.5**	**3133**	**Nil**	**Nil**
Northeast Frontier	**2128**	**35**	**1.6**	**1688**	**Nil**	**Nil**
Southern	**3504**	**93**	**2.6**	**2631**	**84**	**3.2**

Soth Central	**3637**	**168**	**4.6**	**3619**	**Nil**	**Nil**
South-Eastern	**2436**	**5**	**0.2**	Information not furnished		
Western	**5343**	**100**	**1.9**	**3109**	**56**	**1.8**
All Railways	**37309**	**714**	**1.9**	**29746**	**343**	**1.15**
Assistant Drivers						
Central	435	9	2.03	1254	42	3.3
Eastern	576	6	1.04	1247	1	0.1
Northern	207	Nil	Nil	1544	98	6.3
North-Eastern	No category					
Northeast Frontier	198	Nil	Nil	351	Nil	Nil
Southern	155	3	1.9	415	27	6.5
Soth Central	88	Nil	Nil	935	169	18.1
South-Eastern	755	134	17.8	Information not furnished		
Western	155	Nil	Nil	1306	12	0.9
All Railways	**2569**	**152**	**5.9**	**7052**	**349**	**4.94**
Permanent Way Inspectors						
Central	250	3	1.2	115	5	4.3
Eastern	237	Nil	Nil	318	Nil	Nil
Northern	315	4	1.2	345	5	1.4
North-Eastern	227	19	8.9	244	Nil	Nil
Northeast Frontier	109	Nil	Nil	180	Nil	Nil
Southern	233	8	2.4	325	2	0.6
Soth Central	242	Nil	Nil	368	2	0.5

South-Eastern	359	Nil	Nil	375	2	0.5
Western	437	6	1.4	488	2	0.4
All Railways	**2509**	**40**	**1.9**	**2758**	**18**	**0.65**

Train Examiners						
Central	803	17	2.1	1064	53	5.0
Eastern	982	Nil	Nil	1458	6	0.4
Northern	672	5	0.7	867	34	3.9
North-Eastern	242	34	14.0	308	12	3.9
Northeast Frontier	339	18	5.0	376	22	5.9
Southern	424	10	2.4	496	35	7.1
Soth Central	389	17	4.3	443	11	2.5
South-Eastern	714	2	0.28	1058	Nil	Nil
Western	589	9	1.5	761	9	1.18
All Railways	**5154**	**112**	**2.1**	**68319**	**235**	**3.44**

ANNEXURE IX
Leave Reserve Percentages

S. No.	Categories	Percentage
(i)	Operating staff requiring replacement even for short periods for normal working—Class III	**$16\frac{2}{3}$ *to* 30**
(ii)	Operating staff requiring replacement even for short periods for normal working--Class IV	**Do**
(iii)	Running staff of all grades.	**15 to 30**
(iv)	Commercial Staff, inspectorial or supervisory staff and such staff of all departments as require replacements even for short periods for smooth and efficient working—Class III.	**15 to 30**
(v)	Class IV staff of commercial and other departments as require re-placement even for short periods for smooth and efficient working.	**15 to 30**
(vi)	Office Clerks, workshop staff and such staff of all departments who need not be replaced for short period--Class III and skilled.	**12.5**
(vii)	Class IV and semi-skilled.	**12.5**
(viii)	Unskilled and other categories for whom substitutes can be engaged.	**12.5**

ANNEXURE X

Statement showing the time taken by Railway Service Commissions to complete selection of Candidates for Technical and other Categories.

	1974-75		1975-76		1976-77		1977-78	
	Technical categories	**Other categories**	**Technical categories**	**Other categories**	**Technical categories**	**Other categories**	**Technical categories**	**Other categories**
(TIME TAKEN IN MONTHS)								
Railway Service Commission								
Bombay	6.12	11	4.13	-	4.11	11.30	6-15	11-30
Calcutta	6.28	42	10.28	Up to 37	14-18	17	15-15	-
Madras	7-17	12-15	9	16.22	7-19	4.16	8.5-20	15-21
Muzaffarpur								3-17 Up to 21.5*

Note: 1. Information in respect of Railway Service Commission, Allahabad rand Recruiting Committee, Northeast Frontier Railway was not made available. Railway Service Commission, Secunderabad was inaugurated on 14-1-1978 and there was no recruitment up to 31-3-1978.
***2.** This information is for the period 1974-75 to 1977-78.

ANNEXURE XI
Progress of Welding of Rails on Indian Railways
(POSITION AS ON 31-3-1978)

Railways	Length of Running lines on broad and meter gauge	Length of track with short welded pancls (3/5)	Length of track with long Continuous welded Rails	Total Length of welded track (3)+(4)	Percentage $\frac{(5)X100}{(2)}$
1	2	3	4	5	6
		(In kilometers)			
Central	8700	3968	1693	5661	65.07
Eastern	6343	3412	829	4241	66.86
Northern	12336	4894	1243	6137	49.75
North-Eastern	6112	1896	192	2088	34.16
Northeast Frontier	3562	939	74	1013	28.44
Southern	7227	3051	210	3261	45.12
Soth Central	7582	3590	206	3796	50.07
South-Eastern	8280	1416	361	1822	22.00
Western	10589	4916	574	5490	51.85
Total	**70731**	**28127**	**5382**	**33509**	**47.38**

ANNEXURE XII

Requirement and Supply of Broad-Gauge Wooden Sleepers on Indian Railways

A=Quantity Required (Figures in thousands of sleepers), B=Quantity Supplied

Railway	**1973-74**		**1974-75**		**1975-76**		**1976-77**		**1977-78**		**Total 1973-78**		**Percentage** $\frac{(B)X100}{(A)}$
	A	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	
Central	478	148.2	425	119.8	300	149.7	222	128.5	160	83.8	1585	630	39.7
Eastern	260	123.6	290	134.4	400	168.1	230	43.1	223.6	65.5	1103.6	534.7	38.1
Northern	533	81.9	350	200.4	290	101.7	115	91.9	120	110.9	1408	586.8	41.7
North-Eastern	NA	10.5	Nil	Nil	NA	Nil	NA	2.8	NA	6	NA	19.3	..
Northeast Frontier	17	15	30	29.8	34	36.1	42	41	26	20.3	149	142.2	95.4
Southern	117	58.4	127.1	45.6	210	7.6	250	97.6	119.6	46	823.7	319.2	38.8
Soth Central	140	40.8	150	12.8	100	66.6	30	12.7	84.6	35.5	504.6	168.4	33.4
South-Eastern	365	193	370	149	200	86	150	93	153	96	1238	617	49.8
Western	183.5	41	187.5	38	193	32	225.9	103	245	85	1034.9	299	28.9
Total	**2093.5**	**712.4**	**1929.6**	**729.8**	**1727**	**711.8**	**1264.9**	**613.6**	**1131.8**	**540.0**		**3316.6**	**40.7**

ANNEXURE XIII

Requirement and supply of meter Gauge Wooden sleepers on Indian Railways.

A-Quantity required, B-Quantity supplied

Railway	**1973-74**		**1974-75**		**1975-76**		**1976-77**		**1977-78**		**Total 1973-78**		**Percentage** $\frac{(B)X100}{(A)}$
	A	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	
Central	40	13.6	NA	NA	NA	NA	5	4.2	5	3.1	50	20.9	41.8
Northern	178	52.7	145	54.8	195	106.1	93	60.1	50	56.1	661	329.8	49.9
North-Eastern	357.4	129	441.9	170.4	387.3	164	383.5	175	455.4	176.4	2025.5	814.8	40.2
Northeast Frontier	200	195.3	200	193	210	196.5	220	240.7	213	235.2	1043	1060.7	101.7
Southern	195	65.6	247.5	146.4	229	242.4	230	102.5	197.9	71.8	1099.4	628.7	57.2
Soth Central	150	83.3	175	50.3	100	106.5	115.9	88.4	105	141.8	645.9	470.3	72.8
Western	425	63.8	426	65.8	423	54.5	425	167.9	430	105.3	2129	457.3	21.5
Total	**1545.4**	603.3	1635.4	680.7	1544.3	870	1472.4	838.8	1456.3	789.7	7653.8	3782.5	49.4

ANNEXURE XIV

Length of track Laid with concrete sleepers on Indian Railways.

(Figures in kilometers of track)

Railway	**1973**	**1974**	**1975**	**1976**	**1977**	**1978**	**Total**
Central	4.5	1.6	16.3	31.0	29.0	22.6	105.0
Eastern	-	-	-	10.8	5.7	8.8	25.3
Northern	5.0	9.8	16.2	16.5	12.0	4.1	63.6
Southern	-	-	4.1	13.9	34.6	28.8	81.4
South Central	-	-	-	-	9.5	19.6	29.1
Western	-	-	-	-	-	4.6	4.6
Total	**9.5**	**11.4**	**36.6**	**72.2**	**90.8**	**88.5**	**309.0**

ANNEXURE XV

Total Quantity of Ballast procured on Railways.

(FIGURES IN THOUSAND CUBIC METERS)

Railway	1973-74	1974-75	1975-76	1976-77	1977-78	Average Quantity required per year from 1973-78
Central	5.7	589	399	570	590	531
Eastern	251	225	227	192	285	236
Northern	397	341	333	317	381	354
North-Eastern	162	118	127	131	280	164
Northeast Frontier	123	171	221	201	136	170
Southern	90	107	132	134	185	130
Soth Central	347	114	99	175	241	195
South-Eastern	N.A.	279	357	288	311	309
Western	810	458	549	560	N.A.	594
All Railways	**2687**	**2402**	**2444**	**2568**	**2409**	**2683**

*Figures against Eastern and Northeast Frontier Railways indicate quantity put in track.

ANNEXURE XVI

Progress of Primary Track Renewal on Indian Railway during 1968-69 to 1977-78 Through Rail Renewals

Railway	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Central	203	349	216	213	264	225	160	132	125	104
Eastern	329	223	178	113	109	79	126	100	102	69
Northern	480	239	177	166	305	259	225	205	186	131
North-Eastern	30	96	109	75	64	48	76	11	34	82
Northeast Frontier	74	112	111	1	59	77	32	58	57	46
Southern	331	326	233	194	183	85	95	177	200	95
Soth Central	73	145	112	134	158	95	37	59	21	142
South-Eastern	189	148	85	59	96	110	54	81	89	78
Western	250	235	204	214	223	120	123	193	206	146
All Railways	**1959**	**1873**	**1425**	**1169**	**1461**	**1098**	**928**	**1016**	**1020**	**893**

ANNEXURE XVII

Progress of Primary Track Renewals on Indian Railways during 1968-69 to 1977-78 through Sleeper Renewals

(Figures in track kilometers)

Railway	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Central	187	336	202	175	293	308	228	202	202	128
Eastern	277	244	179	156	131	96	122	98	96	57
Northern	505	296	185	221	345	292	239	343	286	223
North-Eastern	30	96	91	106	86	47	74	11	50	228
Northeast Frontier	27	53	38	1	32	89	70	116	99	59
Southern	289	293	217	118	143	92	79	209	195	86
Soth Central	62	137	150	207	306	189	84	32	27	68
South-Eastern	187	146	81	83	114	111	72	72	86	49
Western	361	318	216	304	235	207	171	179	254	200
All Railways	**1925**	**1919**	**1359**	**1371**	**1685**	**1431**	**1139**	**1262**	**1295**	**1098**

ANNEXURE- XVIII

Arrears of track renewals on Indian Railways

(As on 1-4-1978)

S. No.	Gauge & Group	Total length in kilometers	Arrears of Renewal (In kilometers)			
			Through rail renewal		Through sleeper renewal	
			Primary	Secondary	Primary	Secondary
	Broad Gauge					
1	Group A	12983	1418	-	1450	-
2	Group B	11304	1662	-	1943	-
3	Group C	1055	59	-	42	-
4	Group D	5384	497	-	447	-
5	Group E	18796	365	1360	352	1186
6	**Total (1 to5)**	**49522**	**4001**	**1360**	**4234**	**1186**
	Meter Gauge					
7	Trunk Routes	3532	521	-	646	-
8	Main Lines	11022	2218	53	1995	61
9	Suburban Lines	58	-	-	-	-
10	Branch Lines	11314	677	2092	1202	1358
11	**Total (7 to 10)**	**25926**	**3416**	**2145**	**3843**	**1419**
	NARROW GAUGE					
12	Main Lines	902	13	40	68	40
13	Branch Lines	3391	-	1155	-	1178
14	**Total (12 & 13)**	**4293**	**13**	**1195**	**68**	**1218**
15	**Grand Total (6+11+14)**	**79741**	**7430**	**4700**	**8145**	**3823**

ANNEXURE XIX

Length Speed Restriction Due to Obsolete or worn out track(As on 31-3-1978)

(Figures in kilometers of track)

Railway	Broad Gauge	Meter Gauge	Narrow Gauge	Total
Central	43	-	112	155
Eastern	63	-	-	63
Northern	9	17	-	26
North-Eastern	-	426	-	426
Northeast Frontier	-	396	-	396
Southern	6	281	-	287
Soth Central	-	-	-	-
South-Eastern	232	-	53	285
Western	4	307	47	358
All Railways	**357**	**1427**	**212**	**1996**

ANNEXURE- XX

Position of Distressed Bridges and their Rehabilitation.

Railway	Number of Bridges identified distressed up to 1977-78	Number of bridges rehabilitated up to 1977-78	Bridges remaining to be rehabilitated as on 31-3-1978
1	**2**	**3**	**4**
Central	389	113	276
Eastern	349	88	261
Northern	331	161	170
North-Eastern	1054	133	921
Northeast Frontier	1063	230	833
Southern	351	157	194
Soth Central	512	125	387
South-Eastern	406	49	357
Western	392	238	154
All Railways	**4847**	**1294**	**3553**

ANNEXURE XXI

Number of Rail Fractures on Running Lines on Indian Railways

Years	CR	ER	NR	NER	NFR	SR	SCR	SER	WR	All Railways
1963-64	230	149	73	12	1	40	23	26	95	649
1964-65	297	138	78	17	11	44	17	22	98	722
1965-66	134	161	124	16	5	68	26	56	113	703
1966-67	370	172	145	10	13	64	40	17	350	1181
1967-68	401	118	189	5	8	72	31	20	330	1174
Total for 5 Years	**1432**	**738**	**609**	**60**	**38**	**288**	**137**	**141**	**986**	**4429**
1968-69	NA	112	244	6	NA	10	19	80	NA	471
1969-70	NA	96	203	7	NA	14	20	228	NA	568
1970-71	NA	99	237	5	NA	44	21	114	NA	520
1971-72	392	61	300	18	3	42	25	167	154	1162
1972-73	425	69	267	20	..	17	26	129	140	1093
Total for 5 years	**817**	**437**	**1251**	**56**	**3**	**127**	**111**	**718**	**294**	**3814**
1973-74	450	53	247	17	1	36	76	186	130	1196
1974-75	252	120	245	13	32	13	16	260	153	1104
1975-76	221	102	326	8	278	18	118	414	180	1665
1976-77	396	165	315	9	126	20	130	626	276	2063
1977-78	354	198	374	16	107	31	147	775	391	2393
Total for 5 years	**1673**	**638**	**1507**	**63**	**544**	**118**	**487**	**2261**	**1130**	**8421**

Note: 1. NA- Information not Available.

2. The figures indicated under columns CR, SCR and WR are for the full calendar years, however in the table above these have been shown against the financial year which covers the major portion of calendar year.

3. Figures for the period 1963-64 to 1967-68 have been taken from the report of the Wanchoo Committee.

ANNEXURE- XXII

Traffic Blocks for working of Automatic 'On Tracks' Tie-Tamping Machine during the period 1976 to 1978

Railway	Year	Average holding of machines	Total Block per machine worked per month
			Hrs Mts.
Central	(78)	9	53-08
	(77)	8	95-26
	(76)	7	51-01
Eastern	(78)	10	51-26
	(77)	9	63-07
	(76)	9	61-22
Northern	(78)	12	57- 51
	(77)	10.7	44-26
	(76)	10	50-02
Southern	(78)	7	64-23
	(77)	3.7	61-46
	(76)	3	58-16
South Central	(78)	4	44-24
	(77)	3.7	34-10
	(76)	3	51-53
South-Eastern	(78)	5	39-42
	(77)	3.7	54-18
	(76)	3	51-05
Western	(78)	6	58-31
	(77)	4	62-17
	(76)	4	69-42
Average of all Railways	(78)	50	53-38
	(77)	42.8	51-17
	(76)	39	55-37

ANNEXURE- XXIII

Progress of Monitoring of Broad-Gauge Track with Track Recording Cars on the Indian Railways.

Railway	Length of track monitored during (In kilometers)							
	1970-71	**1971-72**	**1972-73**	**1973-74**	**1974-75**	**1975-76**	**1976-77**	**1977-78**
Central	6249	8226	13644	15493	15428	11524	19605	16788
Eastern	7601	5104	8047	4118	6711	9663	9576	9925
Northern	8878	7623	11358	7352	9837	13517	14052	14381
North-Eastern	Nil	Nil	Nil	Nil	Nil	Nil	153	146
Northeast Frontier	NA	NA	719	NA	485	1002	1034	1551
Southern	1292	2607	2311	4255	5434	5185	7785	6553
Soth Central	6908	7013	7585	7612	8910	8925	9351	9795
South-Eastern	6714	4488	10770	8271	15019	7592	11480	13759
Western	1935	2218	2216	2210	1613	2035	2185	1850
All Railways	**39577**	**37279**	**56650**	**49311**	**63437**	**59443**	**75221**	**74748**

ANNEXURE- XXIV

Progress of Monitoring of Meter Gauge Track with Track Recording Cars on the Indian Railways

Railways	Length of track monitored in each year (In kilometers)							
	1970-71	**1971-72**	**1972-73**	**1973-74**	**1974-75**	**1975-76**	**1976-77**	**1977-78**
North-Eastern	1100	1572	1095	1928	2369	1393	2532	2356
Northeast Frontier	630	-	1260	1774	1144	1144	1144	2288
Southern	398	880	1917	1025	1460	1030	1430	1671
South Central	599	601	604	585	-	1500	328	578
Western	NA	NA	907	904	920	930	1154	1102
Total	**2727**	**3053**	**5783**	**6216**	**5893**	**5997**	**6588**	**7995**

Note: 1. There is no meter gauge track on Eastern and South-Eastern Railways.
2. Central and Northern Railways did not furnish the requisite information.

ANNEXURE XXV

Progress of provision of telephone communications at crossings level on Indian Railway

A- Number of level crossings.

B- Number not provided with telephone communication.

			Type of the level crossing						Total	
Railway	**Special class**		**'A' Class**		**'B' Class**		**'C' Class**		**All Class**	
	A	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**
Central	8	Nil	115	5	306	122	1215	815	1644	942
Eastern	20	4	101	17	352	91	730	571	1203	683
Northern	49	Nil	192	9	387	78	1655	667	2283	754
North-Eastern	26	7	131	20	316	181	797	530	1270	738
Northeast Frontier	Nil	Nil	46	9	180	116	403	124	629	249
Southern	47	5	214	17	728	266	800	419	1789	707
Soth Central	20	Nil	116	7	433	89	561	133	1130	229
South-Eastern	5	Nil	148	13	508	89	219	152	880	254
Western	66	8	93	17	313	121	1030	77	1502	223
All Railways	**241**	**24**	**1156**	**114**	**3523**	**1153**	**7410**	**3488**	**12330**	**4779**

ANNEXURE- XXVI

Provision of lifting Barriers at Level Crossings

A- Number of Level Crossings

B- Number of Level Crossings provided with Lifting Barriers

Railway	Special class		'A' Class		'B' Class		'C' Class		Total	
	A	B	A	B	A	B	A	B	A	B
Central	8	4	115	73	306	91	1215	72	1644	240
Eastern	20	20	101	87	352	195	730	119	1203	421
Northern	49	42	192	121	387	151	1655	334	2283	648
North-Eastern	26	21	131	97	316	90	797	129	1270	337
Northeast Frontier	Nil	Nil	46	26	180	105	403	143	629	274
Southern	47	28	214	49	728	79	800	20	1789	176
Soth Central	20	20	116	33	433	95	561	54	1130	202
South-Eastern	5	3	148	129	508	351	219	146	880	629
Western	66	48	93	65	313	132	1030	26	1502	414
All Railways	241	186	1156	680	3523	1289	7410	1043	12330	3341
Percentage $\frac{(B)}{(A)} X\ 100$	**77.2**		**58.8**		**36.6**		**14.1**		**27.1**	

ANNEXURE- XXVII

Progress of provision of colour light signalling on Indian Railways during the period 1968-69 to 1977-78

A-Position as on 1-4-1969, B-Position as on 1-4-1978

	Broad Gauge				Meter gauge					
Railway	**Trunk Route**		**Main Line**		**Branch Line**		**Trunk Route**		**Main Line**	
	A	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**
Central	2	88	-	-	-	-	-	-	-	-
Eastern	60	171	-	-	17	41	-	-	-	-
Northern	-	106	-	14	-	18	-	2	-	-
North-Eastern	-	13	-	-	-	-	55	65	4	18
Northeast Frontier	-	-	-	-	-	-	19	19	2	2
Southern	13	33	-	15	-	27	-	33	-	-
Soth Central	-	39	-	8	-	-	-	-	1	7
South-Eastern	100	114	14	15	44	62	-	-	-	-
Western	-	72	-	19	-	3	-	-	-	3
All Railways	**175**	**636**	**14**	**71**	**61**	**151**	**74**	**119**	**7**	**30**

ANNEXURE- XXVIII

Progress of provision of multiple aspect signalling on Indian Railways as on 30-9-1978

		Trunk Routes		Main Lines		Branch Lines		Total	
		BG	**MG**	**BG**	**MG**	**BG**	**MG**	**BG**	**MG**
1	Total number of stations	1177	444	849	806	1353	1179	3379	2429
2	Number of stations provided with multiple-aspect signalling	943	357	237	340	322	70	1502	767
3	Number of stations where multiple aspect signalling has been programmed	81	67	84	137	46	4	211	208
4	Number of stations in Lower Quadrant territories:								
	(a) With modified Lower Quadrant signalling	78	-	-	-	20	-	98	-
	(b) Separate Warner in rear of the Outer	14	18	2	-	8	-	24	18
5	Balance number of stations where multiple aspect signalling has been neither provided nor programmed	187	15	532	329	986	1105	1705	1449

ANNEXURE XXIX

Provision of Multiple Aspect Signalling on Track Routes-Railway-wise as on 30-9-1978

Railway	Total Number of stations		Number of stations where MAS is provided		Number of stations where MAS is programmed		Number of stations provided with Modified Lower Quadrant Signalling		Number of stations where Warner is provided in rear of Outer Signal		Balance number of stations where MAS has neither been provided nor programmed	
	BG	**MG**	**BG**	**MG**	**BG**	**MG**	**BG**	**MG**	**BG**	**MG**	**BG**	**MG**
1. Central	320	Nil	258	..	29	..	..	..	10	..	33	..
2. Eastern	116	Nil	116	..	..	..	..	..	..	..	..	..
3. Northern	105	13	105	1	..	1	..	..	..	11	..	11
4. North-Eastern	22	119	20	112	2	2	..	..	..	..	..	..
5. Northeast Frontier	..	95	..	95	..	..	..	..	..	..	..	..
6. Southern	19	104	19	87	..	14	..	..	..	..	…	3
7. Soth Central	181	Nil	127	..	16	..	..	..	..	..	38	..
8. South-Eastern	320	Nil	108	..	34	..	78	..	..	..	112	..
9. Western	194	113	190	62	..	50	..	..	4	7	4	1
All Railways	**1177**	**444**	**943**	**357**	**81**	**67**	**78**	**..**	**14**	**18**	**187**	**15**

MAS-MULTIPLE ASPECT SIGNALLING

ANNEXURE XXX

Provision of Multiple -Aspect signalling on Main Lines- Railway-wise as on 30-9-1978.

Railway	Total Number of stations		Number of stations where MAS is provided		Number of stations where MAS is programmed		Number of stations where Warner is provided in rear of Outer Signal		Balance number of stations where MAS has neither been provided nor programmed	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.
1. Central	99	Nil	..	..	..	..	..	..	99	..
2. Eastern	184	Nil	48	..	..	..	..	..	136	..
3. Northern	253	Nil	38	..	22	..	..	..	193	..
4. North-Eastern	..	153	..	40	..	20	..	..	..	93
5. Northeast Frontier	33	104	1	78	36	..	..	..	..	26
6. Southern	95	155	74	103	17	39	..	..	4	13
7. Soth Central	84	210	57	91	8	5	..	..	19	114
8. South-Eastern	82	Nil	14	..	1	..	2	..	67	..
9. Western	19	184	5	28	..	73	..	..	14	83
All Railways	**849**	**806**	**237**	**340**	**84**	**137**	**2**	**..**	**532**	**329**

MAS- MULTIPLE-ASPECT SIGNALLING
ANNEXURE XXXI
Number of Failures of Signal and Interlocking Gears

Railway	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Eastern	1779	8332	8175	14153	16082	17658	16063	16768	14416	17442
Northern	..	..	..	..	..	..	..	..	9247	8445
North-Eastern	5678	4167	2958	2433	2035	4220	4160	3754	2827	2461
Northeast Frontier	1961	2197	2104	2680	2009	1749	1763	2065	1735	1320
Southern	..	..	..	..	..	..	..	738	555	614
Soth Central	5140	5233	5544	8188	2480	3319	3791	4917	2471	6504
South-Eastern	5533	5023	4997	6241	6362	8233	7830	5554	4772	4035
Western	995	1103	548	2534	3222	3128	2839	3545	3593	2099
All Railways	**21086**	**26055**	**24326**	**36229**	**32190**	**38307**	**36446**	**37341**	**39616**	**42620**

Note: Central Railway has not furnished information regarding failures of signal and interlocking gears separately.

ANNEXURE XXXII

Number of Failure of Block Instruments

Railway	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Eastern	..	..	470	693	709	584	989	691	1387	1796
Northern	..	..	..	..	..	..	..	..	1574	1404
North-Eastern	1948	2107	2679	3733	3309	3379	3213	2779	2075	1723
Northeast Frontier	981	985	1078	1404	1200	1005	838	1127	892	519
Southern	..	..	..	..	..	..	..	332	206	267
Soth Central	3247	2956	2689	1950	1448	2096	2206	2652	1057	2493
South-Eastern	958	954	940	1073	1095	1473	1481	1402	1162	1030
Western	397	298	77	789	1073	683	84	644	551	130
All Railways	**7531**	**7300**	**7933**	**9642**	**789**	**9220**	**8811**	**9627**	**8904**	**9362**

Notes: 1. Central Railway has not furnished the requisite information.

2. Years for which no information has been furnished are left blank.

ANNEXURE XXXIII

Number of failures of track circuits

Railway	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78
Eastern	..	..	101	..	829	456	491	648	845	949
Northern	..	..	..	..	..	..	..	..	1035	1046
North-Eastern	295	305	234	282	346	674	915	708	694	589
Northeast Frontier	129	144	608	753	714	517	432	539	528	415
Southern	..	..	..	..	..	..	..	169	92	145
Soth Central	309	267	213	287	166	384	349	351	143	560
South-Eastern	323	433	390	351	446	345	588	645	477	481
Western	828	856	937	1304	1331	1678	1886	1786	1027	751
All Railways	**1884**	**2005**	**2483**	**2977**	**3832**	**4054**	**4661**	**4846**	**4846**	**4936**

Notes: 1. The Central Railway did not furnish the information for track circuit failures separately.

2. Figures against Southern Railway do not include failures on Guntakal Division.

3. Years for which no information has been furnished are left blank.

ANNEXURE XXXIV

Shortfall in overhauling and replacement of lever frames.

A- Shortfall in overhauling of lever frames.

B- Shortfall in replacement of worn out lever frames.

Railway Year	CR		ER		NR		NER		NFR		SR		SCR		SER		WR		All Railways	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
1968-69	..	..	12	8	12	..	72	4	1	..	29	..	1	..	9	..	27	..	163	12
1969-70	..	..	17	18	15	..	63	1	8	..	12	..	..	..	7	..	26	..	148	19
1970-71	..	..	35	6	14	..	58	1	7	..	6	..	..	..	7	..	30	..	157	7
1971-72	..	..	73	13	85	..	55	..	5	..	6	..	9	18	47	2	26	..	306	33
1972-73	7	..	88	8	52	4	72	..	10	2	1	1	13	16	72	4	25	..	340	35
1973-74	6	..	68	6	76	26	64	1	5	2	32	..	15	..	87	6	23	1	376	42
1974-75	..	..	103	14	109	14	119	8	11	2	29	..	14	..	94	6	43	..	522	44
1975-76	15	..	95	4	92	42	92	6	17	2	6	..	13	..	7	6	16	..	353	60
1976-77	10	..	157	5	29	12	35	16	13	2	2	4	26	..	1	6	41	8	314	53
1977-78	8	..	216	21	36	54	40	6	..	2	23	5	48	..	30	6	31	7	432	101

Note: Dash (-) Denotes Nil.

ANNEXURE XXXV

Shortfall in overhauling and replacement of block instruments.

A- Shortfall in Overhauling of block instruments.

B- Shortfall in replacement of block instruments

Railway Year	CR		ER		NR		NER		NFR		SR		SCR		SER		WR		All Railways	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
1968-69	..	..	8	..	7	..	117	14	10	..	..	..	..	..	2	..	..	..	144	14
1969-70	..	..	6	..	16	..	108	..	8	..	15	..	..	..	2	..	..	16	155	16
1970-71	..	..	28	..	9	..	95	..	9	..	..	..	6	..	9	..	..	20	156	20
1971-72	..	..	129	..	3	..	97	..	21	..	..	..	8	..	11	..	..	..	269	..
1972-73	..	..	75	..	13	..	74	..	34	..	..	..	8	..	23	..	5	30	232	30
1973-74	18	..	138	..	16	..	87	..	16	..	23	..	45	..	27	..	28	16	398	16
1974-75	..	..	183	..	20	..	150	..	38	..	..	..	23	..	3	..	46	16	463	16
1975-76	..	..	169	..	10	..	196	..	42	..	8	..	28	..	7	..	2	20	462	20
1976-77	18 (NG)	..	144	..	2	..	351	2	28	..	3	4	54	..	4	..	..	..	604	6
1977-78	18 (NG)	..	82	..	5	..	266	..	32	..	10	...	45	..	..	..	12	4	470	4

Note: Dash (-) denoted Nil

ANNEXURE

Incidence of failures of steam

Railway Year	CR		ER		NR		NER	
	A	B	A	B	A	B	A	B
1968-69	189	164000	..	..	231	183198	..	..
1969-70	162	198000	136	180000	189	218326	..	..
1970-71	157	185000	184	125000	225	169987	..	..
1971-72	128	213000	210	112000	285	129880	..	..
1972-73	126	199000	285	82000	337	94536	..	..
1973-74	184	129000	464	48000	772	40114	..	..
1974-75	284	85000	569	42000	677	44053	..	..
1975-76	228	105000	404	57000	413	81761	..	..
1976-77	135	152000	223	98000	293	120023	4	79000
1977-78	170	126000	287	46000	273	124942	8	70000

ANNEXURE XXXVI
Locomotives on broad gauge

A- Number of engine failures.

B- Average engine kilometers per engine failure.

NFR		SR		SCR		SER		WR		All Railways	
A	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**
17	155667	133	123651	100	199000	118	209000	118	209000	901	180000
54	53757	178	88188	92	201000	102	201000	102	244000	1024	178000
39	71869	118	118503	90	161000	129	161000	129	177000	1074	158000
44	56625	99	141448	114	163000	214	163000	214	100000	1219	136000
22	113023	86	138828	112	131000	141	131000	141	143000	1268	120000
43	47508	82	113947	109	143000	183	143000	183	99000	1967	73000
189	10499	80	112562	79	54000	175	54000	175	97000	2416	59000
209	12743	106	98090	101	65000	164	65000	164	92000	1921	76000
14	152624	98	106401	78	83000	82	83000	82	161000	1110	122000
25	87527	97	100134	80	34000	65	34000	65	201000	1421	87000

ANNEXURE XXXVII

Incidence of Failures of Steam Locomotives on Meter Gauge

A- Number of engine failures.

B- Average engine kilometers per engine failure.

Railway Year	CR		NR		NER		NFR		SR		SCR		WR		All Railways	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
1968-69	7	186000	49	288474	182	157000	135	63494	139	197384	76	208000	129	216000	717	172000
1969-70	36	39000	47	195837	156	191000	99	86174	143	190885	87	180000	110	246000	678	175000
1970-71	62	24000	37	237847	164	183000	128	62072	261	102433	91	168000	104	261000	847	138000
1971-72	35	51000	39	805200	125	236000	205	37174	128	210673	91	150000	129	205000	752	182000
1972-73	29	56000	92	137838	202	147000	168	46749	90	255851	57	211000	110	234000	748	146000
1973-74	19	81000	456	19097	275	87000	206	30543	95	180453	46	240000	138	144000	1235	71000
1974-75	28	53000	329	26034	448	50000	350	11266	38	327982	66	168000	211	82000	1470	52000
1975-76	23	67000	317	34145	535	49000	299	26109	36	207195	74	161000	280	72000	1564	55000
1976-77	22	79000	91	139254	349	80000	96	80592	62	289246	61	193000	149	139000	830	121000
1977-78	26	26000	22	498596	334	81000	104	75357	74	220131	70	213000	185	112000	815	120000

Note: There is no meter gauge on the Eastern and South-Eastern Railways.

ANNEXURE XXXVIII

Incidence of Failures of Diesel Locomotives on Broad Gauge

A- Number of engine failures.

B- Average engine kilometers per engine failure.

Railway Year	CR		ER		NR		SR		SCR		SER		WR		All Railways	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
1968-69	106	191000	28	292000	37	275581	..	..	..	..	..	..	25	197900	196	222000
1969-70	162	130000	50	161000	34	318491	..	..	..	..	..	..	50	150000	296	160000
1970-71	232	99000	90	88000	59	230504	85	100301	..	..	115	128375	83	101000	664	114000
1971-72	245	107000	137	58000	90	179501	80	117185	..	..	137	92401	106	97000	795	104000
1972-73	238	114000	92	85000	164	102505	46	217093	..	..	231	54585	154	76000	925	93000
1973-74	230	117000	88	82000	301	56351	65	161967	..	..	182	68755	134	91000	1000	86000
1974-75	350	76000	153	47000	506	35810	55	172280	..	..	252	59604	198	63000	1514	58700
1975-76	403	71000	262	34000	229	88803	49	224148	74	102000	172	83276	191	70000	1380	75400
1976-77	428	78000	259	50000	160	127188	67	198986	86	123000	212	96675	175	88000	1387	91000
1977-78	440	79000	140	94000	174	15785	69	201388	111	143000	520	34747	160	98000	1614	70700

Note: Wherever the requisite information has not been furnished by the Railways the columns are left blank.

ANNEXURE XXXIX

Incidence of failures of Diesel Locomotives on Meter Gauge

A- Number of engine failures

B- Average engine kilometers per engine failure.

Railway Year	NR		NFR		SR		SCR		WR		All Railways	
	A	B	A	B	A	B	A	B	A	B	A	B
1968-69	..	..	77	78086	..	..	..	..	63	126000	140	99000
1969-70	..	..	65	100389	..	..	..	..	69	137000	134	119000
1970-71	..	..	78	83309	..	..	..	..	54	187000	132	125000
1971-72	..	..	95	75690	..	..	..	..	42	253000	137	130000
1972-73	26	35500	94	82976	..	..	..	..	97	117000	217	92000
1973-74	148	18703	89	76929	..	..	..	..	009	98000	356	60000
1974-75	141	25532	149	45536	..	..	..	..	190	69000	480	48000
1975-76	125	32441	157	52835	24	177009	..	..	124	108000	430	69000
1976-77	76	54753	84	110038	30	165669	13	325060	112	131000	315	118000
1977-78	71	72000	57	167037	14	376918	35	110000	100	143000	277	137000

Notes: 1. Central, Eastern, North-Eastern and South-Eastern Railways had no meter gauge diesel locomotives.

2. Wherever the requisite information has not been furnished by the Railways the columns are left blank.

ANNEXURE XL

Incidence of failures of Electric Locomotives on Broad Gauge

A- Number of engine failures

B- Average engine kilometers per engine failure.

Railway Year	CR		ER		NR		SER		WR		All Railway	
	A	B	A	B	A	B	A	B	A	B	A	B
1968-69	..	..	..	..	176	38010	184	70336	..	..	360	54000
1969-70	522	12000	278	76000	102	73354	230	65401	..	..	1132	44000
1970-71	528	10000	363	61000	84	85501	385	49852	..	..	1360	47000
1971-72	523	12000	350	55000	82	98568	348	54474	..	..	1303	40000
1972-73	426	15000	383	48000	286	32721	407	47376	..	..	1502	35000
1973-74	450	14000	441	39000	313	28971	345	47725	20	..	1569	31000
1974-75	668	8000	570	31000	285	37552	511	38858	29	..	2063	26000
1975-76	718	8000	396	53000	250	50477	575	41823	32	254800	1971	36000
1976-77	510	13000	281	78000	193	80132	782	37287	41	247400	1807	46000
1977-78	313	22000	364	62000	143	134447	983	26653	75	247000	1878	49000

Note: 1. Whenever the requisite information has not been furnished by the Railways the columns are left blank.

2. There was no broad-gauge electric locomotive on the North-Eastern, Northeast Frontier, Southern and South-Central Railways.

ANNEXURE- XLI

Overage Steam Locomotive on Indian Railways

Position as on March 31 of	Broad Gauge			Meter Gauge		
	Holding	Number Overaged	Percentage $\frac{(3)}{(2)} X\ 100$	Holding	Number Overaged	Percentage $\frac{(6)}{(5)} X\ 100$
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1964	6700	2084	31.10	3709	792	21.35
1965	6668	1994	29.90	3645	702	19.26
1966	6619	1883	28.45	3600	618	17.17
1967	6425	1638	25.49	3603	586	16.26
1968	6228	1417	22.75	3593	562	15.64
1969	6056	1254	20.71	3593	587	16.34
1970	5862	1118	19.07	3448	531	15.40
1971	5599	994	17.75	3398	502	14.77
1972	5475	948	19.31	3355	496	14.78
1973	5372	817	15.21	3202	391	12.21
1974	5307	780	14.70	3154	368	11.67
1975	5189	688	13.26	3108	359	11.55
1976	5096	617	12.11	3024	312	10.32
1977	4921	525	10.67	2977	291	9.77
1978	4899	432	8.82	2966	285	9.61
(Provisional)						

ANNEXURE- XLII

Results of Examination by Neutral Control Flying Squads of Wagons in Yards during 1976-77

Gauge and Railway	Number of wagons examined	Number of wagons found with rejectable defects during examination		Percentage of wagons found with rejectable defects during examination	
		Initial	Final	Initial (3)/((2) X 100	Final (4)/(2) X 100
		(Figures are in units)			
(1)	(2)	(3)	(4)	(5)	(6)
Broad Gauge					
Central	7854	7513	4836	95.7	61.6
Eastern	6537	5883	1131	90.0	17.3
Northern	1522	1222	870	80.3	57.2
Northeast Frontier	809	771	513	95.3	63.4
Southern	670	635	290	94.8	43.3
South Central	936	894	120	95.5	12.8
South-Eastern	6282	5559	1483	88.5	23.6
Western	3542	3372	2574	95.2	71.9
Meter Gauge					
Central	893	862	391	96.5	43.8
North-Eastern	1325	1273	115	96.1	8.7
Northeast Frontier	496	448	49	90.3	9.9
Southern	863	826	73	95.7	8.5
South Central	838	736	51	87.8	6.1
Western	2935	2819	1028	96.0	35.0

ANNEXURE- XLIII

Result of Examination by Neutral Control Flying Squads of Terminating Trains in Marshalling yards during 1976-77

Marshalling yards and gauge	Total Number of trains examined	Average daily number of trains examined (2)/365 days	Total Number of wagons examined (In units)	Total Number of wagons rejected (In units)	Percentage of wagons rejected (5)/(4) X 100
(1)	(2)	(3)	(4)	(5)	(6)
Broad Gauge					
New Katni	3895	10.7	249,622	47249	18.9
Andal	3666	10.0	211,716	25373	12.0
Kanpur (G.M.C)	1417	3.9	93,137	9728	10.4
Tondiarpet	3581	8.9	150,256	32626	20.8
Vijaywada	2967	8.1	204,618	54976	26.0
Waltair	4141	11.3	233,478	57819	24.7
Bhilai Marshalling yard	3799	10.4	176,693	34068	19.2
Bandra Marshalling yard	2713	7.4	122,175	12541	10.3
Total	**26179**	**71.7**	**1441,697**	**274380**	**19.8**
Meter Gauge					
Garhara	2903	8.0	179,230	23721	13.2
Siliguri	1713	4.7	91,027	17490	19.2
Guntakal	2163	6.0	79,195	12135	15.3
Phulera	3262	9.0	157,520	16667	10.5
Total	**10041**	**27.5**	**506,972**	**70013**	**13.8**

ANNEXURE- XLIV
Overloading of Box Wagons

Depot	Month	Number of wagons weighed	Number of wagons overloaded	Number of wagons overloaded			Maximum quantity of overload
				Range of overload (in tonnes)			
				4-6	6-8	Over 8	(In tonnes)
Pathardih	May ‘78	11394	906	199	177	103	16.4
	June ‘78	809	580	139	84	64	15.7
Kasunda	May ‘78	1137	751	237	54	28	17.3
	Ju0ne ‘78	1109	733	139	56	62	13.3
Katrasgarh	May ‘78	908	432	76	22	21	13.1
	June ‘78	1128	572	149	62	40	14.0
Andal	May ‘78	5531	3569	140	67	185	16.8
	June ‘78	7572	3305	185	128	104	14.7

ANNEXURE- XLV

Representative Colliery-wise Samples of Overloading of Box Wagons

Depot	Month	Colliery	Number of wagons weighed	Number of wagons found overload	Number of wagons overloaded by				Maximum quantity of overload (tonnes)
					0-4	4-6	6-8	Above 8 (tonnes)	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Pathardih	May '78	Ghanwadih	177	147	37	29	24	57	15.0
	May '78	Chasnala	616	521	282	130	76	33	16.4
	June '78	Ghanwadih	203	149	66	34	20	29	14.4
	June '78	Chasnala	207	176	81	41	30	24	14.7
	June '78	Dhansar	179	103	57	26	16	4	15.7
Kusunda	May '78	Nichitpur	62	51	17	19	5	10	17.3
	June '78	Busseriya	160	119	100	12	2	5	9.5
	June '78	Nichitpur	78	64	36	13	8	7	13.0
	June '78	Sendra Bansjara	151	107	41	28	19	19	13.3
Katrasgarh	May '78	Nudkurkee	119	95	56	23	11	5	13.1
	June '78	Angarpatrhra	225	99	56	16	13	14	11.5
	June '78	Nudkurkee	100	87	38	25	18	6	14.0
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Andal	May '78	Behula	268	192	71	30	14	77	16.8
	May '78	Kumardih-A	584	551	516	9	6	20	10.0
	May '78	Paracea OCP	221	174	106	17	4	47	14.0
	June '78	Behula	130	92	34	6	10	42	14.7
	June '78	Haripur	96	72	50	6	2	14	13.0
	June '78	Paracea OCP	107	68	46	2	1	10	11.7
Satna	May '78	New Damagoria	220	110	46	20	15	29	16.6
	June '78	New Damagoria	310	171	83	35	29	24	12.7
Asansol	May '78	Kalipahari	83	50	41	6	-	3	16.6
Barakar	June '78	Chapapur (Two)	161	114	91	16	5	2	8.9

ANNEXURE- XLVI

Incidence of hot Boxes on broad and meter gauge Coaching Stock on Indian Railways (During 1963-64 To 1967-68 and 1973-74 To 1977-78)

Gauge and Railway	Incidence of hot boxes per 10 million vehicles kilometers									
	1963-64	1964-65	1965-66	1966-67	1967-68	1973-74	1974-75	1975-76	1976-77	1977-78
1	2	3	4	5	6	7	8	9	10	11
Broad Gauge										
Central	1.79	1.57	1.78	1.72	1.90	0.80	0.94	0.90	0.87	0.57
Eastern	0.33	0.40	0.22	0.43	0.41	0.21	0.13	0.31	0.66	0.67
Northern	0.92	1.0	0.96	1.16	2.01	0.71	1.05	0.35	0.37	0.46
North-Eastern	-	-	-	-	-	-	-	-	-	-
Northeast Frontier	-	-	-	0.43	-	0.41	1.55	0.88	0.68	0.46
Southern	1.01	1.49	1.69	1.70	1.07	0.50	1.09	0.42	0.33	0.24
South Central	-	-	-	1.4	1.39	0.64	0.29	0.37	0.32	0.53
South-Eastern	1.34	1.95	1.40	1.24	0.87	1.59	1.43	1.14	0.43	0.67
Western	0.39	0.23	0.33	0.18	0.44	0.58	0.77	0.27	0.35	0.05
All Railways (BG)	**1.02**	**1.12**	**1.09**	**1.11**	**1.24**	**0.71**	**0.82**	**0.53**	**0.52**	**0.43**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Meter Gauge										
Central	9.90	5.23	5.96	5.89	2.89	-	-	-	-	-
Northern	3.28	3.28	3.00	3.59	3.61	3.25	2.54	3.96	3.40	3.30
North-Eastern	3.06	3.55	2.37	3.24	9.17	6.40	6.95	7.05	2.53	2.15
Northeast Frontier	3.46	3.4	1.75	3.43	4.73	8.52	11.5	8.28	5.30	2.73
Southern	2.55	1.33	2.50	3.49	6.77	1.57	1.46	3.48	1.37	1.56
South Central	-	-	-	7.35	7.78	2.56	1.50	1.08	0.87	1.25
Western	1.77	2.82	2.23	4.27	4.34	2.77	2.72	1.67	1.29	1.39
All Railways (MG)	**2.94**	**2.82**		**3.92**	**6.41**	**4.03**	**4.29**	**4.29**	**2.23**	**1.94**

ANNEXURE XLVII

Incidence of Hot Boxes on Broad and Meter Gauge Goods Stock on Indian Railways (during 1963-64 to 1967-68 and 1973-74 to 1977-78)

Railway	Incidence of hot boxes per million wagon kilometers.									
	1963-64	1964-65	1965-66	1966-67	1967-68	1973-74	1974-75	1975-76	1976-77	1977-78
1	2	3	4	5	6	7	8	9	10	11
Broad Gauge										
Central	3.76	11.0	7.63	4.16	3.55	3.38	2.86	2.67	2.24	2.04
Eastern	9.27	8.53	8.0	6.1	6.25	8.69	7.05	5.32	3.83	4.62
Northern	6.85	4.20	2.94	2.71	2.84	4.65	4.83	3.66	2.10	2.50
North-Eastern	..	..	..	..	..	..	..	..	..	..
Northeast Frontier	6.68	3.19	2.59	2.03	1.58	5.44	3.76	2.19	2.07	1.75
Southern	5.55	3.30	3.60	2.38	2.63	2.54	2.26	2.41	1.67	1.86
South Central	..	..	..	2.86	2.5	2.14	1.97	1.55	1.19	1.30
South-Eastern	8.71	7.25	5.17	3.58	3.17	3.0	3.0	4.3	3.6	4.0
Western	6.59	5.43	5.01	3.63	3.44	1.99	2.20	2.08	1.67	2.01
All Railways (BG)	**6.9**	**7.3**	**5.7**	**3.9**	**3.7**	**4.30**	**3.86**	**3.36**	**2.58**	**2.75**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Meter Gauge										
Central	6.41	3.12	3.23	3.61	0.86	0.12	..	..	..	..
Northern	1.92	0.35	0.22	0.46	0.26	0.79	2.17	2.18	1.25	1.35
North-Eastern	1.55	0.68	0.65	0.64	0.92	1.06	1.32	1.38	1.51	1.41
Northeast Frontier	0.79	0.63	0.60	0.64	0.73	1.34	1.73	1.74	1.09	0.94
Southern	4.64	1.27	2.11	2.21	1.26	0.76	0.63	0.57	0.44	0.31
South Central	..	..	..	3.29	2.21	0.74	0.48	0.38	0.36	0.41
Western	3.67	2.25	2.17	2.25	2.46	1.25	1.28	1.65	1.16	0.95
All Railways (MG)	**2.9**	**1.3**	**1.4**	**1.5**	**1.5**	**1.09**	**1.31**	**1.46**	**1.06**	**0.93**

ANNEXURE XLVIII

Results of Checks by Neutral Control Flying Squads of Effective Brake Power of Trains in 12 Broad Gauge Yards (Date of Check: 5-17 March 1973)

Railway and Yard	Originating Trains		Terminating trains	
	Number examined	Percentage of effective brake power (Range)	Number examined	Percentage of effective brake power (Range)
Central				
Ajni	12	38.5 to 76.5	12	62.3 to 89.6
Bhusaval	10	59.2 to 71.7	16	34.3 to 75.9
Eastern				
Asansol	10	65.2 to 83.0	10	23.7 to 74.0
Mughalsarai	16	39.2 to 63.2	14	45.7 to 70.4
Northern				
Khanalampura	8	53.0 to 60.6	13	40.6 to 65.4
Cheoki	11	50.0 to 88.0	13	43.5 to 67.9
Southern				
Jolarpettai	12	51.4 to 88.0	12	49.2 to 73.0
South Central				
Kazipet	12	44.9 to 72.6	12	50.7 to 82.7
South-Eastern				
Bonda Munda	12	70.7 to 85.2	12	45.8 to 78.0

Nimpura	12	65.8 to 86.6	12	50.7 to 85.4
Western				
Ratlam	9	66.6 to 76.6	13	46.5 to 80.0
Baroda (Vadodara)	13	54.0 to 75.7	11	60.0 to 73.5
Summary of the above results showing the number of originating and terminating trains in different ranges of effective brake power.				
Percentage of effective brake power (Range)			**Originating trains (Number)**	**Terminating trains (Number)**
23 to 38			1	3
39 to 45			3	7
46 to 55			23	32
56 to 65			40	49
66 to 75			42	45
76 to 84			18	11
85 and above			10	3
Total			**137**	**150**

ANNEXURE XLIX

Results of Checks by Neutral Flying Squads of Effective Brake Power of Trains at Mughalsarai and Kanpur

(Date of Check: 9-11, June, 1974)

	Number of trains examined	**Percentage of Effective Brake Cylinders (Range)**
Mughalsarai		
Originating trains (ER to NR)	17 (2BOX + 15 Mixed)	51.9 to 71.6(BOX) 60.3 to 79.3(Mixed)
Through trains (ER to NR)	15 (9BOX + 6 Mixed)	57.7 to 77.7(BOX) 60.3 to 78.7(Mixed)
Terminating trains	31 (6 BOX + 25 Mixed)	25.9 to 73.0(BOX) 50.0 to 76.2(Mixed)
Kanpur		
Originating trains (ER to NR)	18 (6 BOX + 14 Mixed)	78.3 to 83.8 (BOX) 68.8 to 95.2 (Mixed)
Through trains (ER to NR)	10	45 to 65
Terminating trains	22 (6 BOX + 16 Mixed)	49.3 to 76.1 (BOX) 64 to 83.3 (Mixed)
Summary of the above results showing the number of originating and terminating trains having different ranges of effective brake power.		

Percentage of effective brake cylinders (Range)	Originating trains	Terminating trains
1	**2**	**3**
Mughalsarai		
44 and below	..	1
45 to 54.9	1	5
55 to 64.9	3	11
65 to 74.9	10	13
75 to 84.9	3	1
85 and above	..	..
Total	**17**	**31**
1	**2**	**3**
Kanpur		
44 and below	..	..
45 to 54.9	..	1
55 to 64.9	..	6
65 to 74.9	4	11
75 to 84.9	11	3
85 and above	3	1
Total	**18**	**22**

ANNEXURE- L

Results of Checks by Neutral Control Flying Squads of Effective Brake Power of Trains at 12 Broad Gauge Yards

(Date of Check February 1975)

Railway and Yard	Originating Trains		Terminating Trains	
	Number examined	Percentage of Effective Brake Power (Range)	Number examined	Percentage of Effective Brake Power (Range)
CENTRAL				
Ajni Nagpur	16	69.0 to 89.7	16	51.5 to 79.6
Bhusaval	20	44.4 to 84.4	20	46.8 to 82.3
EASTERN				
Mughalsarai	25	46.3 to 74.0	24	38.3 to 74.4
Asansol	21	46.3 to 89.7	12	40.3 to 82.6
NORTHERN				
Khanalampura	14	59.4 to 86.9	13	49.2 to 72.9
Kanpur (GMC)	16	47.7 to 82.4	20	35.2 to 79.1
SOUTHERN				
Jolarpettai	10	65.5 to 91.5	9	56.0 to 75.0
SOUTH-CENTRAL				
Kazipet	15	87.5 to 96.2	10	55.4 to 80.6

SOUTH-EASTERN				
Nimpura	18	70.0 to 90.4	19	53.3 to 80.6
Bonda Munda	21	68.4 to 88.7	19	50.0 to 80.5
WESTERN				
Baroda (Vadodara)	18	39.1 to 76.4	16	48.2 to 77.9
Bandara Marshalling Yard	11	60.4 to 90.8	3	56.9 to 73.9
Summary of the above results showing the number of originating and terminating trains having different ranges of effective brake power.				
Percentage of Effective Brake Power (Range)			**Originating Trains**	**Terminating Trains**
			(Number)	**(Number)**
39 to 45			4	8
46 to 55			17	23
56 to 65			38	59
66 to 75			65	75
76 to 84			49	16
85 and above			32	-
Total			205	181

ANNEXURE- LI

Results of Checks Made by Neutral Control Flying Squads of Effective Brake Power of Trains (Date of Check: 7-8-1978 and 8-9-1978)

1. Name of yard train originated/terminated	**Bhusaval to Igatpuri**		**Igatpuri to Bhusaval**		**Asansol to Mughalsarai**		**Mughalsarai to Asansol**		**Moradabad to Lucknow**		**Lucknow to Moradabad**		**Tughlakabad to Gangapur City**		**Gangapur City to Tughlakabad**	
2. Load (Number of wagon units)	58.5		76		74		53.5		72		65		68.5		62	
3. Type of examination given at originating yard	Safe to run				Intensive		Intensive		Safe to run		No examination as through load		Intensive		Safe to run	
4. Amount of vacuum in engine (in cms)	54	50	47	44	49	52	49	50	52	50	45	49	46	50	45	52
5. Amount of vacuum in brake van (in cms.)	40	32	36	34	-	-	-	-	-	-	-	-	38	38	37	-
6. Whether vacuum gauge was available with the Guard as personal equipment.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7. Whether vacuum gauge was in working order.	No	Yes	No	Yes	-	-	-	-	No	Yes	Yes	Yes	Yes	Yes	Yes	No
8. Whether vacuum gauge was fixed by Guard in brakevan.	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No
9. Percentage of effective brake power	89.3	80.2	84.0	68.1	82.2	70.0	65.6	58.1	72.4	59.1	76.4	81.6	64.0	56.0	79.0	73.0

ANNEXURE- LII

Number and Percentage of Coaching Vehicles Overdue POH on the Broad Gauge of all Indian Railways

	Position as on			
	31-3-1976	**31-3-1977**	**31-3-1978**	**31-10-1978**
	(IN VEHICLE UNITS)			
1. Passenger Carrying Vehicles (PCVs)				
(a) Holding	29598	29360	30032	30411
(b) Number Overdue POH	3098	3727	3591	3478
(c) Percentage of overdue POH to holding	10.5	12.7	12.0	11.4
2. Other Coaching Vehicles (OCVs)				
(a) Holding	6419	6594	6722	6837
(b) Number Overdue POH	1467	1392	1499	1484
(c) Percentage of overdue POH to holding	22.9	21.1	22.3	21.7
3. Total of PCVs and OCVs				
(a) Holding	36017	39954	36754	37248
(b) Number Overdue POH	4565	5119	5090	4962
(c) Percentage of overdue POH to holding	12.7	14.8	13.9	13.3

ANNEXURE- LIII

Number and Percentage of Coaching Vehicles overdue POH on the Meter Gauge of all Indian Railways

	Position as on			
	31-3-76	**31-3-77**	**31-3-78**	**31-10-78**
	(Figures are in vehicle units)			
1. Passenger Carrying Vehicles (PCVs)				
(a) Holding	20193	20088	20113	20071
(b) Number Overdue POH	977	1441	1004	856
(c) Percentage of overdue POH to holding	4.8	7.2	5.0	4.3
2. Other Coaching Vehicles(OCVs)				
(a) Holding	4955	4990	4992	5076
(b) Number Overdue POH	629	599	563	470
(c) Percentage of overdue POH to holding	12.7	11.2	11.3	9.3
3. Total of PCVs and OCVs				
(a) Holding	25148	25078	25105	25147
(b) Number Overdue POH	1606	2000	1567	1326
(c) Percentage of overdue POH to holding	6.4	8.0	6.2	5.3

ANNEXURE- LIV

Number and percentage of coaching vehicles overdue POH on the Broad Gauge of different Railways

A= Holding, B= Number overdue POH, C= 'B' taken as percentage of A,

(Figures are in vehicle units)

Railway Position as on	Passenger Carrying Vehicles (PCVs)			Other Coaching Vehicles (OCVs)			Total (PCVs+OCVs)		
	A	B	C	A	B	C	A	B	C
1	2	3	4	5	6	7	8	9	10
1. Central									
31-3-1977	4196	612	14.6	949	231	24.3	5145	843	16.3
31-3-1978	4112	456	11.1	964	246	25.5	5076	702	13.8
31-10-1978	4112	410	9.9	970	212	21.8	5082	622	12.2
2. Eastern									
31-3-1977	5297	888	16.7	1436	278	19.3	6733	1166	17.3
31-3-1978	5341	794	14.8	1526	321	21.0	6867	1115	16.2
31-10-1978	5361	780	14.5	1544	361	23.3	6905	1141	16.5
3. Northern									
31-3-1977	5985	758	12.5	1350	400	29.3	7335	1158	15.7
31-3-1978	5966	920	15.4	1377	412	29.6	7343	1332	18.1
31-10-1978	6052	600	9.9	1388	361	26.0	7440	961	12.9
4. Northeast Frontier									

31-3-1977	804	106	13.2	103	15	14.5	907	121	13.3
31-3-1978	814	60	7.4	195	14	13.3	919	74	8.0
31-10-1978	900	36	4.0	110	10	9.1	1010	46	4.6
5. Southern									
31-3-1977	3781	448	11.8	897	143	15.9	4678	591	12.5
31-3-1978	4145	532	12.8	885	149	14.8	5030	681	13.5
31-10-1978	4136	520	12.6	901	146	16.2	5037	666	13.2
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
6. South Central									
31-3-1977	2476	184	7.43	281	66	23.5	2757	250	9.1
31-3-1978	2486	312	12.6	301	125	41.5	2787	437	15.7
31-10-1978	2686	356	13.3	355	106	29.8	3041	462	15.1
7. South-Eastern									
31-3-1977	3812	451	11.8	662	96	14.5	4474	547	12.2
31-3-1978	4128	325	7.9	640	114	17.8	4678	439	9.2
31-10-1978	4154	522	12.5	653	118	18.1	4807	640	13.3
8. Western									
31-3-1977	3009	280	9.3	916	163	19.5	3925	443	11.3
31-3-1978	3040	192	6.8	824	118	14.9	3964	310	8.0
31-10-1978	3010	254	8.4	916	170	20.4	3926	424	11.6

ANNEXURE- LV

Number and percentage of coaching vehicles overdue POH on the Meter Gauge of different Railways

A= Holding, B= Number overdue POH, C= 'B' taken as percentage of A

(Figures are in vehicle units)

Railway Position	Passenger Carrying Vehicles (PCVs)			Other Coach Vehicles (OCVs)			Total (PCVs+OCVs)		
	A	B	C	A	B	C	A	B	C
1. Northern									
31-3-1977	1750	46	2.6	621	82	13.2	2371	128	5.4
31-3-1978	1750	154	8.8	621	98	15.8	2371	252	10.6
31-10-1978	1785	96	5.4	614	74	12.0	2399	170	7.8
2. North-Eastern									
31-3-1977	5165	823	15.9	1655	207	12.5	6820	1030	15.1
31-3-1978	5166	346	6.7	1583	251	15.9	6749	597	8.9
31-10-1978	5156	168	3.3	1592	149	9.4	6748	317	4.7
3. Northeast Frontier									
31-3-1977	2703	182	6.6	866	112	13.0	3569	294	8.2
31-3-1978	2720	76	2.7	858	61	7.1	3578	137	3.8
31-10-1978	2729	40	1.4	843	36	4.3	3572	76	2.1
4. Southern									
31-3-1977	3533	164	4.6	786	95	12.1	4319	259	6.0

31-3-1978	3549	140	3.9	738	74	10.0	4287	214	5.0
31-10-1978	3425	214	6.3	723	106	14.7	4148	320	7.7
5. South Central									
31-3-1977	1902	64	3.4	201	34	16.9	2103	98	4.6
31-3-1978	1950	102	5.2	197	26	13.2	2147	128	6.0
31-10-1978	1942	110	5.7	207	28	13.5	2149	138	6.4
6. Western									
31-3-1977	5035	162	3.2	861	29	3.3	5896	191	3.2
31-3-1978	4978	186	3.7	995	53	5.3	5973	239	4.0
31-10-1978	5034	228	4.5	1097	77	7.0	6131	305	4.9

ANNEXURE- LVI

Number and Percentage of Wagons Overdue POH on the Broad and Meter Gauge of all Indian Railways

Gauge	Position as on			
	31-3-1976	31-3-1977	13-3-1978	31-10-1978
	(Figures are in wagon units)			
Broad Gauge				
(a) Holding	389232.5	392762	403865	407262.5
(b) Number overdue POH	67825	42238	37258	40299
(c) Percentage of overdue POH to holding	17.4	10.8	9.2	9.9
Meter Gauge				
(a) Holding	111357	114563	115124	113341
(b) Number overdue POH	15371	11623	9813	9315
(c) Percentage of overdue POH to holding	13.8	10.1	8.5	8.2

ANNEXURE LVII

Number and percentage of wagons overdue POH on the broad and meter gauges of different Railways.

A= Holding, B= Number of wagons overdue POH, C= 'B' taken as a percentage of 'A'

Gauge and Railways	Position as on								
	31-3-1977			31-3-1978			31-10-1978		
	A	B	C	A	B	C	A	B	C
Broad Gauge									
Central	63098	7704	12.2	64065	6995	10.9	64048.5	6989.5	11.0
Eastern	79200	8331.5	10.5	81893	6161	7.5	82379	7669	9.3
Northern	74800	13075.5	17.5	73205.5	10478	14.3	72846.5	10122.5	13.9
Northeast Frontier	159	5	3.1	158	5	3.2	158	2	1.3
Southern	32797	2462	7.5	31617	2194	6.9	31250	2277	7.3
South Central	4046	..	..	10693.5	..	..	13158	..	..
South-Eastern	92830	4686	5.0	96193	5808	6.0	97082.5	7886	8.1
Western	45832	5924	12.9	46040	5617	12.2	46331	5353	11.2
Meter Gauge									
Northern	8411	2371	28.2	8399	1395	16.6	8566	1264	14.8
North-Eastern	34327	2343	6.8	35807	1835	5.1	33699	1822	5.4
Northeast Frontier	16090	1517	9.4	14784	1020	7.0	14996	831	5.5
Southern	11629	980	8.4	11664	790	6.8	11691	994	8.
South Central	16348	2172	13.3	16550	2470	14.9	16341	2038	12.
Western	27758	2240	8.0	27920	2303	8.2	28048	2306	8.

Note: - All figures are in wagon units.

ANNEXURE LVIII

Failure of Spherical Roller Bearings on coaching stock (ICF) during 1977

A= Number of failures on line, B= Number of bearings replaced in workshops due to damage/defects during inspection.

Type of Coaching stock	CR		ER		NR		NER		NFR		SR		SER		WR		Total		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A+B
ICF(BG)	15	158	9	100	31	79	..	*	..	*	3	304	5	284	5	48	68	973	1041
ICF(MG)	..	..	No	MG	30	197	14	104	15	..	..	394	No	MG	..	371	59	1066	1125
IRS(MG)	..	..	No	MG	..	..	..	..	1	..	..	..	No	MG	..	..	1	..	1
Total	15	158	9	100	61	276	14	104	16	..	3	698	5	284	5	419	128	2039	2167

***POH was not undertaken on North-Eastern and Northeast Frontier Railways**

Incidence of roller bearing failures on Coaching Stock during 1977

Type of Coaching stock	Number of Roller Bearings on Coaching Stock in use	Number of Roller Bearing failures on line plus replacements in workshops	Percentage of failures $\frac{(3)}{(2)} X$ 100
(1)	(2)	(3)	(4)
ICF(BG)	49432	1041	2.105
ICF(MG)	17192	1125	6.544
IRS(MG)	742	1	0.13
ICF(BG + MG)	66624	2166	3.25
-do-(on line)	"	127	0.19
-do-(in Workshops)	"	2039	3.06

ANNEXURE LIX

Failure of Cylindrical Roller Bearings on Broad Gauge Coaching Stock (BEML) during 1977

Railway	Number of failures on line	Number of bearings replaced in workshops	Total
Central	9	8	17
Eastern	15	..	15
Northern	8	..	8
Southern	6	91	97
South-Eastern	11	87	98
Western	..	16	16
All Railways	**49**	**202**	**251**
Incidence of failure of Cylindrical Roller Bearings on Coaching Stock			
Total Number of Cylindrical Roller Bearings on BEML(BG)		47264	
Total Number of failures		251	
Percentage failure (Total)		$= \frac{251\ X\ 100}{47264} = 0.531$	
Percentage failure on line		$= \frac{49\ X\ 100}{47264} = 0.104$	
Percentage failure in workshops		$= \frac{202\ X\ 100}{47264} = 0.427$	

ANNEXURE LX

Failures of Roller Bearings on BOX Wagons during 1976.

A-Number of failures on line, B- Number of bearings replaced in workshops due to damage/defects during inspection

Make of Roller	CR		ER		NR		SR		SCR		SER		WR		All Railways		Total
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	(A+B)
NBC	198	915	152	145	41	1	13	100	4	-	153	516	67	833	628	2510	3138
FAG	39	36	21	16	-	-	2	16	2	-	25	80	4	64	93	212	305
KOYO	12	30	9	8	-	-	1	5	2	-	14	12	-	24	38	79	117
PRETIS	24	36	8	10	-	-	1	5	2	-	5	26	1	22	41	99	140
Total	**273**	**1017**	**190**	**179**	**41**	**1**	***17**	***126**	***10**	**-**	**197**	**634**	**72**	**943**	**800**	**2900**	**3700**

*Assumed figures on the basis of reports for the years 1974 and 1975

Incidence of roller bearing failures on BOX wagons	
Total number of roller bearings on BOX wagons	491320
Total number of failures of roller bearings on line plus replacements in workshops during 1976	800 + 2900= 3700
Failures and replacements taken as a percentage of total number of roller bearings	$\frac{3700\ X\ 100}{491320} = 0.75$

ANNEXURE LXI

Failure of Roller Bearings on BOX Wagons during 1977.

A-Number of failures on line, B- Number of bearings replaced in workshops due to damage/defects during inspection.

Make of Roller Bearing	CR		ER		NR		NFR		SR		SCR		SER		WR		All Railways		Total
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	(A+B)
NBC	47	1345	151	323	50	483	2	..	11	78	23	..	199	1322	75	790	558	4341	4899
FAG	2	101	9	42	1	..	1	..	1	8	..	..	12	192	4	48	30	391	421
KOYO	4	48	7	7	..	..	..	..	2	1	1	..	9	32	..	13	23	101	124
PRETIS	1	50	4	9	1	..	..	..	..	3	..	..	5	126	4	33	15	221	236
Total	**54**	**1544**	**171**	**381**	**52**	**483**	**3**	**..**	**14**	**90**	**24**	**..**	**225**	**1672**	**83**	**884**	**626**	**5054**	**5680**

Incidence of roller bearing failures on BOX wagons	
Total number of roller bearings on BOX wagons	= 5,35,050
Total number of failures of roller bearings on line plus replacements in workshops	626 + 5054 = 5,680
Failures and replacements taken as a percentage of the total number of roller bearings	$= \frac{5680\ X\ 100}{535050} = 1.06$

ANNEXURE LXII
List of Coaching Workshops on Indian Railways

S. No.	Name of Workshop	Railway
Workshops where Neutral Control Examination is in force.		
1	Matunga	Central
2	Lilluah	Eastern
3	Alambagh	Northern
4	Jodhpur	Do
5	Bikaner	Do
6	Gorakhpur	North-Eastern
7	Dibrugarn	Northeast Frontier
8	New Bongaigaon	Do
9	Perambur	Southern
10	Golden Rock	Do
11	Mysore	Do
12	Lallaguda	South Central
13	Hubli	Do
14	Kharagpur	South-Eastern
15	Raipur	Do
16	Parel and Mahalaxmi	Western

17	Ajmer	Do
Workshops where Railway's own Inspection is in force		
18	Jhansi	Central
19	Kanchrapara	Eastern
20	Jagadhari	Northern
21	Kalka	Do
22	Izatnagar	North-Eastern
23	Samastipur	Do
24	Tindharia	Northeast Frontier
25	Kurduwadi	South Central
26	Nagpur	South-Eastern
27	Udaipur	Western
28	Morvi	Do
29	Gondal	Do
30	Pratapnagar	Do
31	Bhavnagar	Do

ANNEXURE LXIII

Results of Examination by Neutral Control Staff of Broad-Gauge Coaches after P.O.H. in workshops period: October to December.

Name of Workshop (Railway)	Total Number of Coaches offered for examination	Total Number of Coaches noticed with defects on final examination	Total Number of Coaches detained for further attention	Tootal Number of coaches passed	Percentage of coaches detained $\frac{(4)X100}{(2)}$	General Service Coaches passed by Workshop staff without obtaining neutral control fit Certificate	
						Number	Percentage $\frac{(7)X100}{(2)}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Matunga (C)	844	320	147	697	17.4	91	10.8
Lilluah (E)	661	237	325	336	49.2	319	48.3
Alambagh (N)	554	267	161	393	29.1	167	30.1
Perambur (S)	768	288	34	734	4.4	Nil	Nil
Lallaguda (SC)	342	341	44	297	12.9	177	51.8
Kharagpur (SC)	713	626	147	566	20.6	Nil	Nil
Parel (W)	465	262	47	418	10.1	8	1.7

ANNEXURE LXIV

Result of Examination by Neutral Control Staff of Meter Gauge Coaches after POH in Workshops

Period: October to December, 1970.

Name of Workshop (Railway)	Total Number of Coaches offered for examination	Total Number of Coaches noticed with defects during final examination	Total Number of Coaches detained for further attention	Tootal Number of coaches passed	Percentage of coaches detained $\frac{(4)X100}{(2)}$	General Service Coaches passed by Workshop staff without obtaining neutral control fit Certificate	
						Number	Percentage $\frac{(7)X100}{(2)}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bikaner(N)	104	4	Nil	104	Nil	77	74.0
Jodhpur(N)	276	110	29	247	10.5	2	0.7
Gorakhpur (NE)	930	356	56	874	6.0	48	5.2
New Bongaigaon (NF)	360	112	26	334	7.2	Nil	Nil
Mysore South(S)	144	70	12	132	8.3	4	2.8
Golden Rock(S)	817	787	16	801	1.9	Nil	Nil
Hubli(SC)	559	447	16	543	2.9	Nil	Nil
Ajmer(W)	747	432	87	661	11.5	3	0.4

ANNEXURE LXV

Result of Examination by Neutral Control Staff of Broad-Gauge Coaches after POH in Workshops.

		Period “ “	A : January to March, 1978 B : April to June, 1978 C : July to September, 1978		
Name of Workshop (Railway)	**Period**	**Total Number of coaches turned out as per workshop records.**	**Total Number of coaches passed by Neutral Control Staff.**	**Percentage of Coaches passed by Workshop Staff without obtaining Neutral Control fit certificates.** $\frac{(3)-(4)}{(3)} X\ 100$	**Percentage of Coaches once offered but detained due to defects during Final Examinatiom**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Matunga(C)	A	668	628	6.0	12.1
	B	638	527	17.4	31.7
	C	658	440	33.1	60.4
Lilluah(E)	A	803	665	17.2	15.3
	B	781	556	28.8	13.8
	C	709	665	6.2	6.3
Alambagh(N)	A	589	340	42.3	80.6

	B	587	486	17.2	69.4
	C	560	448	20.0	57.0
Perambur(S)	A	734	698	4.9	5.0
	B	776	732	5.7	5.7
	C	856	756	11.7	11.7
Golden Rock(S)	A	3	3	Nil	Nil
	B	14	11	21.4	Nil
	C	22	19	13.6	Nil
Lalaguda(SC)	A	438	250	42.9	36.8
	B	419	315	24.8	23.0
	C	451	325	27.9	29.5
Kharagpur(SE)	A	702	658	6.3	12.0
	B	648	610	5.9	12.0
	C	627	528	15.8	24.7
Raipur(SE)	A	36	36	Nil	Nil
	B	44	42	4.5	Nil
	C	48	48	Nil	Nil
Parel(W)	A	431	377	12.5	16.6
	B	446	357	20.0	23.4
	C	486	415	14.6	15.2

ANNEXURE LXVI

Results of Examination by Neutral Control Staff of Meter Gauge Coaches after POH in Workshops.

		Period **“** **“**	**A : January to March, 1978** **B : April to June, 1978** **C : July to September, 1978**		
Name of Workshop (Railway)	**Period**	**Total Number of coaches turned out as per workshop records.**	**Total Number of coaches passed by Neutral Control Staff.**	**Percentage of Coaches passed by Workshop Staff without obtaining Neutral Control fit certificates.** $\frac{(3)-(4)}{(3)} X\ 100$	**Percentage of Coaches once offered but detained due to defects during Final Examinatiom**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Bikaner (N)	A	138	134	2.9	Nil
	B	138	138	Nil	Nil
	C	132	130	1.5	Nil
Jodhpur (N)	A	270	231	14.4	12.6
	B	271	226	16.6	14.7
	C	246	234	4.9	4.9
Gorakhpur (NE)	A	694	664	4.3	4.3
	B	668	594	11.1	3.9
	C	632	446	29.4	29.4

New Bongaigaon (NF)	A	478	310	85.1	32.8
	B	429	298	30.5	52.2
	C	358	159	55.6	56.1
Dibrugarh (NF)	A	475	375	21.0	Nil
	B	84	84	Nil	Nil
	C	78	76	2.6	2.6
Mysore South (S)	A	176	163	7.4	7.4
	B	199	195	2.0	Nil
	C	232	230	0.9	Nil
Golden Rock (S)	A	515	496	3.7	0.4
	B	441	315	28.6	21.4
	C	540	461	14.6	8.0
Hubli (SC)	A	391	391	Nil	1.5
	B	426	426	Nil	2.5
	C	417	417	Nil	3.2
Ajmer (W)	A	598	598	Nil	12.1
	B	624	624	Nil	Nil
	C	602	602	Nil	19.9

ANNEXURE LXVII

Results of Spot Checks Conducted by Neutral Control Flying Squad, Showing Number of Wagons on Broad Gauge with Rejectable Defects Having a Direct Bearing on Safety, In Final Examination During 1974-75 to 1976-77.

A-Number of wagons in units examined, B-Number of wagons in units found with rejectable defects having direct bearing on safety (Prefixed 'S'), C-Percentage = B/A x 100.

Railway	1974-75			1975-76			1976-77		
	A	B	C	A	B	C	A	B	C
Central	2319	1885	81.3	2614	2077	79.5	1280	810	63.3
Eastern	3148	2335	74.2	6308	3905	61.9	7569	4757	62.8
Northern	2393	1823	76.2	1357	1255	92.5	1520	1234	81.2
Northeast Frontier	593	478	80.6	-	-	-	252	220	87.3
Southern	640	578	90.3	674	508	75.4	230	194	84.3
South Central	1208	987	81.7	178	137	77.0	-	-	-
South-Eastern	1570	1216	77.5	6754	4047	59.9	5198	3019	58.1
Western	1279	923	72.2	1859	1615	87.0	736	392	53.3
All Railways	**13150**	**10225**	**77.8**	**19744**	**13544**	**68.6**	**16785**	**10626**	**63.3**

Note : No checks were carried out on the North-Eastern Railway

ANNEXURE LXVIII

Results of Spot Checks Conducted by Neutral Control Flying Squad, Showing Number of Wagons on Meter Gauge with Rejectable Defects Having a Direct Bearing on Safety, In Final Examination During 1974-75 to 1976-77.

A-Number of wagons in units examined, B-Number of wagons in units found with rejectable defects having direct bearing on safety (Prefixed 'S'), C-Percentage = B/A x 100.

Railway	1974-75			1975-76			1976-77		
	A	B	C	A	B	C	A	B	C
Central	129	121	93.8	-	-	-	-	-	-
North-Eastern	2808	2117	75.4	1599	1427	89.2	1555	1227	78.9
Northeast Frontier	882	735	83.3	1056	937	88.7	685	573	83.6
Southern	1134	900	79.4	1264	1021	80.8	571	496	86.9
South Central	475	384	80.8	520	444	85.4	971	768	79.1
Western	136	134	98.5	422	396	93.8	669	526	78.6
All Railways	**5564**	**4391**	**78.9**	**4861**	**4225**	**86.9**	**4451**	**3590**	**80.7**

Note: No checks were conducted on the Northern Railway and on the Central Railway during 1975-76 to 1976-77.

ANNEXURE LXIX

Number and Percentage of Overaged Coaches on Broad and Meter Gauges of all Idian Railways

A-Holding in vehicle units, B-Number of overaged coaches, C-'B' taken as a percentage 'A'

Position as on 31st March of	Broad Gauge			Meter Gauge		
	A	B	C	A	B	C
1964	16,341	5,077	31.1	12,605	3,128	24.8
1965	16,433	4,726	28.8	13,127	2,967	22.6
1966	16,438	4,434	27.0	13,371	2,779	20.8
1967	16,519	4,035	24.4	13,461	2,654	19.7
1968	16,931	3,831	22.6	13,633	2,855	20.9
1969	17,239	3,583	20.8	13,785	2,730	19.8
1970	17,421	3,285	18.9	13,971	2,649	19.0
1971	17,626	3,057	17.3	14,027	2,587	18.4
1972	17,978	2,797	15.6	13,974	2,311	16.5
1973	18,294	2,478	13.5	14,179	2,090	14.7
1974	19,932	2,275	11.4	13,912	1,900	13.7
1975	19,178	2,045	10.7	13,648	1,646	12.1
1976	19,433	1,702	8.8	13,509	1,451	10.7
1977	19,449	1,485	7.6	13,486	1,401	10.4

ANNEXURE- LXX

Number and Percentage of Overaged Wagons on Broad and Meter Gauges of all Indian Railways.

A-Holding (in wagon units), B-Number of overaged wagon, C-'B' taken as a percentage of 'A'

Position as on 31st March of	Broad Gauge			Meter Gauge		
	A	B	C	A	B	C
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1964	2,47,247	29,103	11.8	91,023	12,863	14.1
1965	2,58,464	25,885	10.0	93,763	13,292	14.2
1966	2,68,678	25,079	9.3	95,581	13,669	14.3
1967	2,73,363	23,185	8.5	96,492	13,919	14.4
1968	2,74,873	18,005	6.6	97,069	13,549	14.0
1969	2,79,472	15,701	5.6	96,724	13,492	13.9
1970	2,80,930	14,491	5.2	97,000	13,055	13.5
1971	2,82,684	13,429	4.8	95,804	12,512	13.1
1972	2,82,398	12,235	4.3	94,682	11,896	12.6
1973	2,84,925	11,319	4.0	93,598	11,143	11.9
1974	2,90,289	12,054	4.2	92,545	10,462	11.3
1975	2,94,642	12,626	4.3	90,950	9,684	10.6
1976	3,00,192	14,452	4.8	89,760	8,918	9.9
1977	3,03,357	13,589	4.5	89,336	8,574	9.6

ANNEXURE- LXXI

Number and Percentage of Overaged Coaches on Broad and Meter Gauges of Different Railways.

Gauge position as on	CR	ER	NR	NER	NFR	SR	SCR	SER	WR
Broad Gauge									
31-3-1976									
Holding	2746	3703	3841		415	2421	1563	2650	2094
Number of overaged	211	363	465		5	144	109	216	188
Percentage	7.7	9.8	12.1		1.2	5.9	7.0	8.2	9.0
31-3-1977									
Holding	2723	3585	3945		461	2404	1571	2622	2064
Number of overaged	188	330	413		5	112	98	191	147
Percentage	6.9	9.2	10.5		1.1	4.7	6.2	7.3	7.1
Meter Gauge									
31-3-1976									
Holding				1302	3525	1908	2413		1319
Number of overaged				248	433	176	150		203
Percentage				19.0	12.3	9.2	6.2		15.4
31-3-1977									
Holding				1256	3579	1881	2278		1304
Number of overaged				196	551	161	122		163
Percentage				15.6	15.4	8.6	5.4		12.5

Note : *There was no holding of broad gauge coaches on the North-Eastern Railway and of meter gauge coaches on the Central, Eastern and South-Eastern Railways.

@The Northern Railway did not furnish the requisite information for meter Gauge coaches.

ANNEXURE- LXXII

Number and Percentage of overaged wagons on Broad and Meter Gauges of Different Railways.

Gauge position as on	CR	ER	NR	NER	NFR	SR	SCR	SER	WR
Broad Gauge									
31-3-1976									
Holding	56127	65774	60011		79	25680	1394	5973	36154
Number of overaged wagons	2407	4290	2866		10	898	78	2834	1069
Percentage	4.3	6.5	4.8		12.7	3.5	5.6	5.2	3.0
31-3-1977									
Holding	56894	65395	59116		79	24792	7279	55606	36196
Number of overaged wagons	2161	3710	2915		7	958	77	2606	1155
Percentage	3.8	5.7	4.9		8.9	3.9	10	4.7	3.2
Meter Gauge									
31-3-1976									
Holding			6491	27922	11986	8346	13826		21189
Number of overaged wagons			438	2950	938	760	2277		1555
Percentage			6.7	10.6	7.8	9.1	16.5		7.3
31-3-1977									
Holding			6369	27879	11991	5177	13716		21204
Number of overaged wagons			359	2868	957	674	2104		1612
Percentage			5.6	10.3	8.0	13.0	15.3		7.8

Note : *There was no holding of broad gauge wagons on the North-Eastern Railway and of meter gauge wagons on the Eastern and South-Eastern Railways.

APPENDIX

Recommendations and observations of the Wanchoo Committee, along with the action taken and the presnet position, as advised by the Railway Board in respect of the recommendations not dealt with in Chapted IV of this Report.

Item no.	Item Recommendation/observation No. made by the Railway Accidents Inquiry Committee-1968.	Action taken and the present posi- tion as advised by the Railway Board. Note: Remarks given within brackets, i.e. ( ) are by the Railway Accidents Enquiry Committee-1978.
PART I CHAPTER I- INTRODUCTORY		
1	We have decided to take a period of five years commencing from 1st April, 1963 and ending on 31st March, 1968 for the purpose of re- view of the position of accidents.	This is an observation. No action was considered to be necessary.
2	We have decided to include in Part I of our Report (a) a statistical appreciation of the trend of accidents since the setting up of the Kunzru Committee and (b) an appreciation of the action taken by the Government on the Kunzru Committee's	This is an observation. No action was considered to be necessary.

	recommendations and our evaluation in regard to these. These cover item (i) of the terms of reference set down for us.	
	Note: The Ministry of Railways (Railway Board) had given their con-sidered views (hereinafter referred to as the 'initial views') on each of the observations and recommendations made by the Wanchoo Committee, which were placed on the table of both Houses of Parliament. In response to the enquiry of this Committee the Railway Board have advised the action taken and the present position, railway-wise in respect of the accepted recommendations of the Wanchoo, Committee which has been given in column 3 of this Appendix. The position as now advised to this Committee has been supplemented with the 'initial views of the Railway Board wherever considered necessary. In items where the 'Initial views' have been given, the present position has been shown against 'final views'. Items for which the 'initial views' have not been further supplemented by the Railway Board have been shown as such only. In respect of recommendations of the Wanchoo Committee which have been dealt with in Chapter IV of this report the relevant paragraph number has been indicated for reference.	
3	We have decided that the second part of our Report would be devoted to suggestions to minimize accidents further as required in item (ii) of the terms of reference. We may find it necessary to	This is an observation. No action was considered to be necessary.

	amplify in Part II of cur Report some of the observations made in the light of further information and elucidation,	
CHAPTER II- STATISTICAL APPRECIATION OF IMPORTANT CATEGORIES OF TRAIN ACCIDENTS		
4	We have decided to confine our study mainly to the four principal categories of accidents, namely, collisions, derailments (including those caused by train wrecking), accidents at level crossings and fires in trains. In addition, other categories which are accidents only technically but are otherwise potential hazards, like averted collisions, breach of block rules and drivers passing signals at danger have been surveyed in broad terms.	This is an observation. No action was considered to be necessary.
5	The Kunzru Committee had surveyed the incidence of certain categories of accidents from 1957-58 to 1962-63. In order, therefore, to bring out a comparative perspective, we have, where	This is an observation. No action was considered to be necessary.

	possible, juxtaposed the corresponding figures for the years 1957-58 to 1962-63 in our study.	
6	There was a significant decrease in the number of accidents in each of the four categories, namely, collisions, derailments, accidents at level crossings and fires in trains during the five years ending 1967-68 as compared to the 6-year period ending 1962-63. The decline over these years was fairly steady except for a slight reversal of the trend during 1967-68.	This is an observation. No action was considered to be necessary
Collisions		
7	The number of collisions on both the broad and the meter gauges came down considerably on all the Railways individually during the years 1963-64 to 1967-68 as compared to the preceding six years.	This is an observation. No action was considered to be necessary.
8	We find that the wide gap in the incidence of collisions per million train	This is an observation. No action was considered to be necessary.

	kilometers between the broad gauge and the meter gauge, pin-pointed by the Kunzru Committee, has been considerably narrowed down during the last five years primarily because of the improvement on the broad gauge, even though the incidence on the meter gauge continued to be lower than on the broad gauge.	
9	We see no reason fer fixing different targets for the broad gauge and meter gauge in respect of collisions and we are unable to sub- scribe to the view that the higher incidence of collisions on the broad gauge is inevitable.	The Railways were advised that it was no longer necessary to prescribe tar- gets for accidents. The Railways should continue to aim at progressive elimination of all categories of accidents and to that end the targets as far as accidents are concerned should be considered as zero.
10	The incidence of goods train collisions per million goods train kilo- meters has been showing a more or less downward trend; the position in regard to passenger train collisions has been fluctuating. The incidence of passenger train collisions per	The observation is noted. No action was considered to be necessary.

	million passenger train kilometers on both the broad and the meter gauges showed an in- crease in 1967-68.	
11	The largest proportion of collisions on the broad gauge during the period 1963-64 to 1967-68 was bet- ween 'two trains or between a train and light engine. Such collisions constituted 50.6 per cent of the total number of collisions on the broad gauge. The incidence of such collisions shot up in 1962-63 and though since then, some decline has been registered, the incidence has continued to be high.	The observation is noted. No action was considered to be necessary.
12	The percentage of collisions "bet- ween a train and a rake or load or vehicles stabled on a running line' during the period 1963-64 to 1967-68 was substantial. This is a pointer to the fact that lever collars and similar reminder appliances do not seem to be in regular use and this habit needs to be ingrained into the station staff.	Necessary instructions in this regard had already been issued to the Rail- ways vide Railway Board's letter No. 62/W3/SGA/1 dated 2-2-1963 wherein it was desired that the provision of lever collars at all inter-locked stations on their system should be checked and it should be ensured that these are provided with adequate number of lever collars. However, these

		instructions were once again reiterated to the Rail- ways vide Railway Board's letter No. €9/Safety/RAIC-68/Items 12-16 dated 16-6-1969 for strict compliance.
13	The incidence of collisions between 'a train and a trolley or a lorry' on the broad gauge registered a substantial decrease in the last five years when compared with the preceding six years. Considering that in most of such collisions responsibility rests squarely on the official in-charge of the trolley or lorry who is usually a responsible railway official, there is consider able scope to reduce and, if possible, eliminate such accidents.	The Railways were advised that in compliance with the recommendation, they should enforce the rules regarding running of trollies, motor trollies and lorries stringently and endeavour to eliminate such accidents.
14	The incidence of collisions between 'a train and buffer ends or other stationary objects' on the broad gauge has been fluctuating over the last 11 years and in particular during the first four years of the five-year period reviewed by us, the incidence has registered a rise from one	Merely an observation. No action was considered to be necessary.

	to six.	
15	There has been decline in the number of collisions on the meter gauge under each group except these between 'a train and buffer ends or other stationary objects' when comparing the five years 1963-64 to 1967-68 with the previous six years ending 1962-63.	Merely an observation, no action was considered to be necessary.
16	Our observations about the use of lever cellars and reminder appliances, made earlier in the case of broad gauge, apply equally to meter gauge also.	Remarks given against item-12 hold good in this case also.
17	The average number of collisions caused by the reception of trains on blocked lines or despatching them into blocked sections in the years 1963-64 to 1967-68, taking the broad and the meter gauges together, remained more er less the same as during the preceding six years.	Merely an observation, No action was considered to be necessary.
18	The average number of collisions caused by drivers disregarding signals or failing to control traits during the five years	This is an observation.

	ending 1967-68 remained more or less the same as during the preceding six years.	
19	The incidence of collisions due to failures of the station staff was the heaviest on the Central, the Northern and the South-Eastern Railways; due to failures of drivers on the South-Eastern and the Eastern Railways, and due to non-protection of trollies or lorries on the Southern Railway.	The attention of the Central, Eastern, Northern. Southern and South-Eastern Railways was drawn to the Wanchoo Committee's observation and also Rail-way Board's letter No. 65/Safety - 1/1 / 1 dated 30-3-1967.
20	Of the total number of collisions attributable to failures of station staff, nearly 71 per cent of these occurred at the time of reception of trains and 21 per cent at the time of despatch of trains. Of the collisions caused at the time of reception of trains, nearly half were due to lines being occupied and of the collisions which occurred at the time of despatch of trains. more than half of the collisions occurred due to obstruction of line.	This is a factual analysis. No action was considered to be necessary.

21	Of the total number of collisions caused by the failures of drivers more than half occurred due to the drivers disregarding or over- shooting the signals governing them.	This is a factual analysis. No action was considered to be necessary.
22	The factor of speed has no mark- ed correlation with the incidence of collisions within the authorized speed ranges.	This is an observation. No action was considered to be necessary.
Derailments:		
23	The incidence of derailments shows a generally declining trend over the years on both the broad and meter gauges, though on the broad gauge the position has been more or less static since 1965-66.	Initial views: On the broad gauge the derailments per million train kilometers have been: Average per year during: 1957-58 to 2.3 1962-63 -- 1963-64 --2.3 1964-65 --1.6 1965-66 --1.3 1966-67 --1.2 1967-68 --1.2 1968-69 --1.0

		(Upto December, 1968) The improvement has been 48 per cent both over the average of the period 1957-58 to 1962-43, as also between 1963-64 and 1967-68 i.e. within 3 years which is a substantial improvement, The position has not remained quite static since 1965-66 as there was 7 per cent improvement during 1968-69 (Upto December 1988). Besides, during 1966-67 to 1967-68 the number of derailments has averaged 353 per year against the 5 years' average of 433 derailments between 1963-64 to 1967-68- an improvement of 18 per cent. **Final views:** No action was considered to be necessary.
24	The incidence of derailments on the meter gauge has continued to be consistently higher than on the broad gauge despite the lesser train kilometrage on the former. This has been there all through and was so even during the years	Initial views: Precisely for this reason two special studies have already been conducted in connection with the higher incidence of derailments on the meter gauge on the Central and South- ern Railways. A special probe was al- so

	1957-58 to 162-63.	undertaken personally by two Di- rectors of the Railway Board in respect of high incidence of derailments on the Northeast Frontier Railway, particularly on the long and difficult hill sections of the Lumding District of that Railway. As a result of these probes, certain corrective measures have been taken and working practices improved upon. This has already yielded results and there has been a continuous downward trend in the number of derailments on the meter gauge sections. Final views: No action was consider- ed to be necessary.
25	While overall, there has been an improvement in the incidence of derailments, the position, relating to mid-section derailments has not kept pace with the improvement as registered in station derailments.	This observation was brought to the notice of all Indian Railways vide letter No. 69/Safety/RAIC-68/Item 15 dated 27-6-1969 and it was desired that they, particularly the Northern, North-east Frontier, Southern and South Eastern Railways should make a note of the observation of the Wanchoo Committee

		and take all possible preventive measures to improve the position of mid-section derailments.
26	The deterioration in position in regard to the mid-section derailments on the broad gauge during the five years ending 1967-68 was contributed by the Northern, the Southern and the South-Eastern Railways.	Merely an observation. No action was considered to be necessary.
27	There was a sharp rise in the mid-section derailments on the meter gauge on the Northeast Frontier Railway.	This item being merely an observation required no further action in view of the fact that the position on the North- east Frontier Railway had already im- proved.
28	There was an increase in the number of passenger train derailments on both the gauges and of goods train derailments on the broad gauge during 1967-68 as com- pared to the previous year.	Initial views: The higher incidence of passenger derailments on both gauges was due to failure of certain components of passenger stock which have since been replaced by components of Improved design and material. Final views: Component improvement is a continuous process, and as and when any component is observed to give unreliable

		performance, the RDSO and the Railways make a special study, and suitable modifications are undertaken. If necessary, many of the modifications are discussed at Loco Standards Committee, Carriage and Wagons Standards Committee, Diesel Maintenance Group and Electrical Standards Committee meetings also.
29	The Southern Railway on the bread gauge and the Northeast Frontier Railway on the meter gauge are at the top in respect of passenger as well as goods train derailments per million passenger and goods train kilometers respectively.	While drawing the attention of the Southern and Northeast Frontier Railways to this observation of the Wanchoo Committee, it was desired that these Railways should make all out efforts to improve the position.
30	On the broad gauge, the incidence of passenger train station and mid-section derailments was the highest on the Northern Railway and of goods train station and mid-section derailments on the Central and the South-Eastern Railways.	In directions issued to the Norther Railway (Ref. No. 89/Safety/RAIC-68/ 30 dated 12-6-1969) it was desired that the factors responsible for the higher incidence of passenger train derailments should be located and adequate remedial measures taken to minimize the incidence

		of such accidents. The Central and South-Eastern Railways were also advised (Ref. No. 69/Safety/RAIC- 68/30 dated 12-5-1969) that though the position in regard to the goods train derailments had improved on their systems during 1968-69, it is considered that there is ample scope for further reducing the number of derailments both at stations and in the mid-section involving goods trains by taking more stringent and adequate measures.
31	On the meter gauge, the derailments involving both passenger and goods trains at stations were e heaviest on the North-Eastern Rail way and in mid-section on Northeast Frontier Railway.	Pursuant to this recommendation a reference was made to the North East- ern and Northeast Frontier Railways. While the position on the North-Eastern Railway has already improved a lot, the Northeast Frontier Railway had written that due to special topographical features on the Lumding-Badarpur section and introduction of dieselization the derailments on this section had gone up

		but consequent upon strengthening of track, the incidence of derailments has come down. A Committee of Deputy Heads of Departments was ap pointed to go into this matter and had covered all these points. A D.O. letter was also written to the General Manager, Northeast Frontier Railway desiring to have the position of mid-section derailments reviewed by a Committee consisting of Chief Operating Superintendent, Chief Mechanical Engineer and Chief Engineer. They were required to review the recommendations made by the Committee of Deputy Heads of Departments and the extent to which the recommendations made by them, had been effectively implemented and suggest further steps that may be required to minimize the incidence of mid-section derailments on the Northeast Frontier Railway.
32	The incidence of derailments attributable	Necessary modifications have already

	to each of the broad causes viz. staff failures, permanent way failures, carriage and wagon defects, engine defects and miscellaneous causes declined substantially both on the broad and meter gauges in the five years ending 1967-68 as compared to the preceding six years, except in the case of engine defects on the meter gauge; the number of derailments on the meter gauge due to engine defects increased from 164 in the six years ending 1962-63 to 228 in the sub- sequent five years.	been carried out.
33	The mid-section derailments attributable to staff failures rose on the broad gauge from 66 during the six years ending 1962-63 to 95 during the five years ending 1967-68. On the meter gauge, the total number of mid-section derailments attributable to this cause came down from 269 to 202.	Initial views: From March 1966 the classification of causes attributable to mechanical and other failures and to the Railway staff was slightly revised, in that even for mechanical failures or permanent way failures, in case staff were held responsible for neglect leading to such failures, the cause was to be shown under the heading "staff failures" and not under

		"failures of mechanical equipment". This change has to a large extent, accounted for the increase under this head. **Final views:** No further action was considered to be necessary.
34	The total number of derailments attributable to permanent way failures came down substantially during the period under review as compared to the preceding six years the number of mid-section derailments attributable to this cause, however, increased significantly,	The observation of the RAIC-1968 was brought to the notice of the concerned Railways, Le., Southern, South-Eastern and Northeast Frontier Railways. Necessary instructions were also issued to these Railways vide Railway Board's letter No. 69/W6 /TK/2 in February, 1969 advising them to pay greater attention to maintenance of track and to take suitable precautions to avoid inci- dents of sinkage of track.
35	The number of derailments attributable to carriage and wagon defects both station and mid-section showed a decrease on both the broad and the meter gauges during the five years ending 1967-68 as compared with the preceding six years.	This is an observation. No action was considered to be necessary.

36	The incidence of derailments attributable to engine defects showed a clear decline in the five years ending 1967-68 as compared with the previous six years on the broad gauge. On the meter gauge, the incidence due to this factor went up in respect of both mid-section and station derailments.	**Initial views:** The modifications already carried out on meter gauge locomotives, as suggested by the RDSO, have reduced such derailments at stations. **Final views:** No further action was called for.
37	There was a substantial reduction in the incidence of station and mid-section derailments attributable to miscellaneous causes during 1963-64 to 1967-68 as compared with 1957-58 to 1962-63 on both the broad and the meter gauges on all the Railways except the Northeast Frontier Railway.	Vide Railway Board's letter No. 69/ Safety/RAIC-68/37 dated 6-6-1969 to the General Manager, Northeast Fron- tier Railway, it was desired that the Northeast Frontier Railway should take note of the observation of the Wanchoo Committee and make genuine efforts to bring down the incidence of station and mid-section derailments due to 'miscellaneous causes'. In this connection, attention was also invited to Railway Board's letter No. 69/Safety/RAIC-68/ 47 (Para 2) dated 20-5-1969, wherein it was directed that the officers holding departmental inquiries

		should always endeavour to arrive at precise findings. Such findings as "the accident being caused by a combination of factors none of which individually could have caused an accident" etc., should be avoided, to the extent possible and that where inevitably a combination of factors is held to blame, an attempt should be made to quantify the relative contribution of each of the factors.
38	3+We have studied further the broad causes of derailments by classifying them according to their nature in order to have a closer look at each of the causes.	Merely an observation. No action was considered to be necessary.
39	A large proportion of derailments attributable to staff failures on both the gauges caused by incorrect setting or non-locking or faulty operation of points. Disregard of the approach and departure signals and failure to regulate or control trains on the broad gauge. excessive speed and faulty driving on the meter	Merely an observation. No action was considered to be necessary.

	gauge were the other main.	
40	The largest number of derailments due to incorrect setting or non-locking of points and due to drivers' failures occurred on the Central Railway on broad gauge and on the North-Eastern Railway on the meter gauge.	Vide Railway Board's letter No. 60/ Satet 5 /RGIC-68/Item 40 dated 17-5- 1969, the Central and North-Eastern Railways were asked to take note of the observation of the Wanchoo Committee and endeavour to bring down the incidence of such derailments.
41	A substantial number of derailments attributable to permanent way failures on both the gauges was caused by sinkage of track and other causes which are manifestations of unsatisfactory maintenance of track.	It is the constant endeavour of the Railways to improve maintenance of track so as to keep it in fit and safe condition to meet the present day needs of traffic as well as the future demands keeping in view the introduction of heavier axle loads and higher speed. On heavy density and high-speed routes the track structure is being progressively modernized by laying heavier section long welded rails on concrete/steel sleepers with elastic fastenings. Improved methods of track maintenance such as measured shovel packing, directed track maintenance and

		mechanized maintenance are being introduced to increasing lengths of track. On important routes parameters and track various track geometry are being monitored regularly by Track Recording and Oscillograph cars. Track defects noticed during such runs of these inspection cars are attended to promptly. Ultrasonic rail flaw detectors are being used on important routes and sections, where incidence of rail fractures is high, to periodically inspect the track rails so as to detect internal flaws in the rails not visible to the naked eye, which could result in a sudden rail fracture. Defective rails detected during such ultrasonic tests are promptly replaced. All possible remedial measures which include patrolling of track on vulnerable sections in heavy rainfall areas, during the monsoon seasons, are taken to prevent

		incidents of sinkage of track.
42	The incidence of derailments de to poor maintenance of track has been the heaviest on the Southern and the South-Eastern Railways and due to sinkage of track on the South-Eastern and the Northeast Frontier Railways.	Instructions were issued vide Railway Board's letter No.69/W6/TK/2 dated 13-2-1969 to the Sothern, South-Eastern and Northeast Frontier Railways to pay more attention towards maintenance of track and also for taking suit- ab measures to check incidents of sinkage of track.
43	The chief carriage and wagon defects responsible for derailments on both the gauges were defective or broken springs or suspensions, broken axles or journals, defective wheels or tyres and breakage of undergear vacuum or brake fittings.	**Items 43 and 44:** The quality of springs has been improv. ed and their performance is being closely watched on the Railway. Testing of axle journal by non-destructive methods is being done to ensure detection of flaws in time. The undergear parts and brake fittings are also being critically examined during repair schedules, Special care is taken regarding the examinations of roller bearings used on coaching stock.
44	The incidence of derailments due to defective or broken springs or suspensions was the highest on the South-	

	Eastern and the Southern Railways due to broken axles and journals on the Northern and West- ern Railways and due to breakage of undergear and brake fittings on the South-Eastern and the North-Eastern Railways.	
45	45. The largest single primary factor in derailments due to engine defects on the bread gauge was defective wheels and tyres. On the meter gauge too, this was the longest single factor next to other engine detects.	Regular periodical inspection is being done on the Railways to ensure that there are no defects on wheels and tyres of locomotives, there has been improvement in the position with regard to failures of these parts.
46	The incidence of derailments due to detective wheels and tyres was the highest on the Southern Railway on the broad gauge and the Western Railway on the meter gauge.	For meter gauge, the Western Railway and for broad gauge, the Southern Railway have intensified inspection of wheels and tytes. This has resulted inconsiderable improvement in the incidence of derailments due to defective wheels and tyres.
47	We find that in a large number of cases of derailments, the cause is shown as 'accidental'. We apprehend that by	While bringing this to the notice of all Indian Government Railways vide Rail-way Board's letter No. 69/Safety/ RAIC-

	treating the causes of derailments wholesale as occidental, the administration's attention is unlikely to be pin pointed on the source of trouble. It would appear to indicate as if the enquiring officers were bringing a depart-mental approach to bear on the question and avoiding the fixing of pointed responsibility.	68/Item 47 dated 20-5-1969, the attention of the Railways was invited to Railway Board's circular letter No. 63-TTV/5/1 dated 25-2-1963 issued as a result of Kunzru Committee's recommendation wherein it was desired that the officers holding departmental enquiries should always endeavour to arrive at precise findings in all cases Such findings as "the accident being caused by a combination of factors none of which individually could have caused an accident" etc. should be avoided to the extent possible and that where inevitably a combination of factors is held to blame, an attempt should be made to quantify the relative contribution of each of the factors to the extent possible, Instructions on the subject were reiterated to the Railways vide Railway Board's letter No. 63- TTV/5/1 dated 15-8-1965. Vide letter No. 88/Safety/ 35/1 dated 7-11-1968, the Railways were again

		advised that they should avoid indiscriminate grouping of various types of accidents under the category 'accidental, and it was explained in detail, as to what type of accidents are to be categorized as 'accidental. The Railways were asked to take action accordingly in the light of the above directives.
48	We find that the speed factor docs not have a direct correlation with the incidence of derailments. Accidents at level crossings.	Merely an observation. No action was considered to be necessary.
49	Nearly 69 per cent of the accidents at level crossings during the last five years occurred at unmanned level crossings which constitute 62 per cent of the total number of level crossings. The remaining 31 per cent of the accidents took place at manned level crossing which constitute 38 per cent of the total number of level crossings. This broadly confirms the	Merely an observation. No action was considered to be necessary.

	conclusion, earlier drawn by the Kunzru Committee also, that the manning of level crossings does not provide a completely satisfactory remedy against the accidents at level crossings.	
50	The incidence of accidents per manned and unmanned level crossing taken separately as well as together has been reduced appreciably during the last five years as compared with the six years ending 1962-63.	Merely an observation. No action was considered to be necessary.
51	The number of passenger trains involved in accidents at level crossing was more than of goods trains on both the broad gauge and the meter gauge systems; the disparity was greater in the case of meter gauge.	Merely an observation. No action was considered to be necessary.

52	The number of accidents at manned level crossing involving passenger trains increased from 9 to 14 on the broad gauge and from 1 to 5 on the meter gauge during 1967-68 as compared to the previous year. This is a disturbing feature.	In view of the deteriorating situation of accidents at level crossing, the Railways were asked vide Railway Board's letter No. 68/Safety/35/3 dated 28-12-1968, to launch a special drive during the first fortnight of January, 1969 to arrest the deteriorating trend. Instructions had also been issued vide Railway Board's letters No. 63/WI/AC/1 dated 29-1-1963, 63/WI/LX/32 dated 3-3-1964, and No. 67/Safety - I / 26 / 1 dated 20-10-1967 that in addition to the regular census of traffic passing through level crossing gates, census should also be taken immediately after the occurrence of an accident at a particular level crossing gate to decide whether the gate, if unmanned, required manning or if manned required upgrading. In this connection, the duty rosters of the gatemen and the working instructions should also be reviewed. Efforts should also be made by the Railways to contact

		the local authorities in order to persuade them to meet their share of the cost expeditiously where manning or upgradation of level crossings pending on this account. On Railways, like the Northern Railway, where a large number of tractors have been involved in accidents at unmanned level crossings, special efforts should be made for wide publicity among the farmers through the rural programmes of the All India Radio, Block Development Officers, Village Heads. Village Panchayats and the local agriculture and cooperative societies etc.
53	53. In the accidents at manned level crossing during the last five years, about 53 per cent railway staff and 47 per cent road users were involved in acts of omission and commission.	Actually, the failure of railway staff used to be much more and has come down to 53 per cent. No further action was considered to be necessary.
54	The largest proportion of the accidents at both manned and unmanned level crossings involved motor trucks, the	No further action was considered to be necessary.

	bullock carts coming next. Between themselves, these two were involved in about two- thirds of all the accidents at level crossing during the last five years.	
55	55. The number of accidents at manned level crossings was the highest during 00.00 to 04.00 hours, closely followed by that during 20.00 to 24.00 hours; during these 8 hours of night, 42 per cent of the total number of accidents at manned level crossings occurred. The need for intensive and surprise checks of gates at night is, thus clearly indicated.	Vide Raway Board's letter No. 69 / W * I / AC/1 dated 18-2-1969, instructions were reiterated to the Railways to intensify surprise inspections of level crossing night. Those instructions are being followed.
56	The largest number of accidents unmanned level crossing i.e., about 38 per cent of the total number of accidents at unmanned level crossing occurred during the day. viz, from 08.00 to 16.00 hours, and another 37 per cent during the hours of partial daylight, viz 14.00 to 08.00 hours and 16.00 to 20.00 hours.	Nothing significant seems to have emerged out of the analysis of the Wanchoo Committee. Hence ne action was considered to be necessary.
Fires in Trains		

57	The incidence of fires in trains showed a steep fall on both the gauges during the years 1963-64 to 1967-68, primarily because of the revised definition of fires in trains: the comparison with the six-year period ending 1962-63 is. however, not tenable.	Merely an observation. No further action was considered to be necessary.
58	The number of fires in trains on the broad gauge was nearly double of that on the meter gauge; the incidence of fires in trains per million train kilometers was, however, identical on both the gauges.	This is an observation. No further action was considered to be necessary.
59	During the years 1966-67 and 1967- 68, the incidence of fires in passenger trains per million passenger train kilometers was much higher on the meter gauge than that on the broad gauge, considering that overall the passenger train kilometers on the broad gauge are nearly twice that on the meter gauge; the relatively higher incidence of fires in trains on the meter gauge cannot but be viewed with concern.	Necessary action regarding anti-fire measures on trains including meter gauge sections has been taken. Electrical fires on meter gauge coaches are now fewer.

60	The incidence of fires in this correlated to the density factor has been substantial on the Southern, the Central, the Eastern and the South-Eastern Railways.	Fires due to electrical causes on these Railways have shown a decrease.
61	We had that three-fourths of the cases of fires in trains took place on passenger trains and only one-fourth on the goods trains.	No further action was considered to be necessary.
62	We find that 32 per cent of fire in passenger trains resulted from defects or failures of electrical equipment or short-circuiting of wires. This cause continued to the most important single factor resulting in fires in trains. This was pin-pointed by the Kunzru Committee also during their review of the six year period ending 1962-63.	Railways continue to be watchful of all factors likely to contribute to electrical fires as brought out in RDSO's study report. Regular checking is done in depots for earth leakage and short circuits.
63	Sparks from engines were responsible for about 11 per cent of the Ares in passenger trains.	In addition to fitting of spark arrestors extensive modifications to coaches are being done to minimize spread of fire.
64	Negligence of passengers and railway staff was responsible for 18 per cent and	The Railways were asked to intensity their means of propaganda about the hazards of

	12 per cent respectively of fires in passenger trains during the last five years. The need for punitive action against defaulting staff, intensification of propaganda about the hazards of careless acts on the part of the passengers, etc. are, thus clearly indicated.	careless acts on the part of the passengers through posters etc. and ensure that staff held responsible for are cases are punished adequately. (Railway Board's letter No. 69/Safety/ RAIC-68/Item 84 dated 23-7-1969).
65	In 41 cases, i.e., nearly one-fifth of the total number of fires in passenger trains, the cause could not be established. The Central Railway could not determine the cause of Ares in 21 out of these 41 cases. We are unable to see any special reason why the Central Railway should be less able to locate the cause of fires in passenger trains than its other counterparts and should accept that position with complacency.	No action was taken in view of the fact that this has been engaging the Rail- way Board's attention.
66	66. The highest contributory factor of fires in goods trains was the negligence of railway staff and the next highest the negligence of outsiders.	This is an observation, No action was considered to be necessary.

Accidents on Narrow Gauge Lines		
67	The number of accidents on the narrow gauge came down substantially during the last five years as compared to the six-year period ending 1962-63. The decline is reflected in the incidence of all categories of accidents except collisions; the incidence of collisions during the two periods was more or less equal.	This is an observation. No action was considered to be necessary.
68	There were nine collisions all in- volving passenger trains on the narrow gauge during the last five years; six of these were between two trains including a train and a light engine. Six of the collisions were caused by reception of trains on blocked lines or incorrect set- ting of points.	This is an observation. Vide letter: No. 69/Safety/RAIC-68/Item 68 dated 94-1969 the Railways were asked to take note of the observation of the Committee and endeavour to bring down the incidence of collisions on the narrow gauge by reception of trains on blocked lines or incorrect setting of points, particularly by exercising greater checks on exchange of line labels and line badges etc. prior to the reception of trains.
69	Derailments constituted nearly 83 per cent of all the important accidents on the	This is an observation. No action was considered to be necessary.

	narrow gauge during the last five years	
70	The number of station and mid- section derailments on the narrow gauge was 68 and 247 respectively during the last five years.	This is an observation. No action was considered to be necessary.
71	71. Out of the 315 derailments, 74 occurred due to staff failures, 31 due to track defects, 70 due to carriage and wagon defects, 31 due to engine defects and 109 due to miscellaneous causes.	This is an observation. No action was considered to be necessary.
72	(i) (See Chapter IV, Para 611) to (iii).	
73	All the accidents at level crossings on the narrow gauge occurred at unmanned level crossings; the number of passenger trains in- volved in such accidents was about twice that involving goods trains.	This is an observation. No action was considered to be necessary.
Breach of block rules		
74	A steadily falling trend is noticed in the number of cases of breach of block rules as also the incidence per million train kilometers on both the broad and the meter gauges.	This is an observation. No action was considered to be necessary.

75	The high incidence of breach of block rules on the broad gauge and the meter gauge respectively was on the Central and the Southern Railways.	While bringing the observation to the notice of the Central and Southern Railways vide letter No. 69/Safety/ RAIC - 1968/1 Item 75 dated 18-2-1969 the Railways were asked that the Safety Organization should further intensify its campaign in educating the staff, impressing upon them the inherent dangers involved in the breach of block rules and that an analytical study of cases of breach of block rules during the last five years should be under- taken.
76	More than half, i.e., 53 per cent of the cases of breach of block rules were comprised of drivers' entering the block section with- out an authority or with an in- correct authority to proceed, In another 39 per cent cases the irregularities were on the part of the station staff who received trains on blocked lines or despatched them into occupied sections or closed the line when	This is an observation. No action was considered to be necessary.

	the section was not clear etc.	
77	We find that the block irregularities take place pre-ponderingly on the single line.	This is an observation. No action was considered to be necessary.
	Disregard of signals by drivers	
78	We find that out of 895 cases of disregard of signals, 266 resulted in mishaps Le. collisions, derailments or accidents at level crossings and 48 of the 266 cases related to passenger trains.	This is an observation. No action was considered to be necessary.
79	There has been a substantial re duction in the average number of cases of disregard of signals over all as also on the broad gauge On the meter gauge, however there was a marginal deterioration.	The Northern, Central, North-Eastern, Northeast Frontier, Southern, South Central and Western Railways vide Hathway Board's letter No. 63/Safety/ RAIC-68/Item 79 dated 29-5-1969 were there was a marginal deterioration to take note of the Committee's observation and make all possible efforts to bring down the incidence of cases of disregard of signals meter gauge.
80	The incidence of disregard of signals in respect of both passengers and goods trains was the heaviest on the Western	This was brought to the notice of North-Eastern and Western Railways vide Railway Board's letter No. 69/

	Railway on the broad gauge and the North-Eastern Railway on the meter gauge.	Safety/RAIC - 68/80 dated 18-2-69. A number of directives have been issued for talking various measures to eliminate the incidence of disregard of signals by the drivers which have been responsible for some very serious collisions.
81	On the broad gauge, the average number of cases in respect of each type of signals came down during the last five years when compared with the preceding six years except where two or more signals were disregarded together.	Merely an observation. No action was considered to be necessary.
82	On the meter gauge there was an increase in the incidence of disregard of approach signals and a marked deterioration in respect of departure signals. This de-serves due notice of the Railways concerned.	Drawing attention to the earlier directions issued the Railways were directed to make all out efforts in the light of the observations of the Wan- chou Committee to minimize the incidence of disregard of signals. The earlier directives, inter-aila, required intensive counselling of drivers particularly the diesel and electric loco-motive drivers, reviewing the position regarding visibility of signals, calling out

		aspect of signals by the drivers and firemen, exchange of signals with the station staff, holding meetings with senior subordinates of Operating and Mechanical Departments, scrutinizing the past history of drivers, deterrent punitive action etc. A further analysis undertaken on the basis of the position for 1918-69 and 1969-70 did not Indicate any improvement in this regard and revealed that in half of such cases the drivers lost control over their in while entering the stations, it was further emphasized upon the Railways that besides ensuring adequate brake power, more effective steps should be taken to inculcate in the drivers the habit of keeping their trains as fully under control while approaching the stations. All supervisory and inspecting officials were required to be alert to check and report any violation of speed restrictions.

83	Signals on automatic territory were disregarded to the extent of nearly 7 per cent of the total number.	This is an observation. No action was considered to be necessary.
84	There was some deterioration in the incidence of disregard of signals on the South-Eastern, the Western, the Southern and the Northern Railways during the years 1963-64 to 1967-68 as compared with the preceding six years.	Initial views: While attention of the Western and South-Eastern Railways has been drawn to the deterioration in the incidence of disregard of signals, there appears to have been some statistical error in regard to the position obtaining on the Southern and the Northern Railways. Final views: No action was considered to be necessary.
85	During the last five years, three or more signals were disregarded together on no less than 19 occasions and all the four signals of a station were ignored at the same time in 6 cases, The dis- regard of two signals or more at the same time by the drivers indicates not merely a momentary lapse but a total aberration of the faculties of perception and control. We suggest that this would be a fruitful	The Psyche-Technical Cell conducted the study into two phases, first seeking to explore the relationship between various personnel environmental factors and disregard of two or more consecutive signals and the second aiming to identify the level of visual vigilance of the drivers who disregard two or more consecutive signals at the same time and compare their vigilance performance with those who

	field for study by the Psycho-Technical Cell.	disregarded only one or no signals. Necessary instructions were issued to the Zonal Railways vide Railway Board's letter No. 69/Safety/RAIC-68/ Item 85 dated 9/15-12-1970 for implementing the suggestions made by the Psycho-Technical Cell which, interaila, included (a) rational persuasion and safety counselling of drivers with a view to changing their attitude towards driving, duly explaining the consequences arising out of such lapses and showing slides etc. of major mis- haps, (b) focusing attention on super- vision, personalized contacts, safety counselling, safety education etc. on drivers who have low level of education, the emphasis being more on helping rather than finding faults with the, (c) making drivers aware of the likely hazards of train working during mid-night early morning time zone, specially on the second consecutive night or beyond. (d)

		avoidance of consecutive night duties being given to drivers, particularly diesel drivers to the extent possible, as this category of drivers was found relatively more vulnerable to disregard of two or more consecutive signals. In regard to the second phase of the study, a special purpose equipment viz. vigilometer was designed and develop ed by the Psycho-Technical Cell collaboration with the Council of Scientific & Industrial Research. This equipment became available to the Psycho-Technical Cell in 1974 and was put to field trials involving testing of drivers held responsible for disregard of signals.
86	Nearly 81 per cent of the cases of disregard of signals on the broad gauge and 78 per cent of such cases on the meter gauge took place at stations provided with lower quadrant two aspect	Merely an observation, No action was considered to be necessary.

	signalling.	
87	On a number of occasions, signals were disregarded at stations equipped with multiple aspect up per quadrant and colour light signals on both the gauges, The need for educating the drivers in correctly observing the aspects of multiple-aspect signals and correctly reading their indications is. thus, highlighted.	The Railways were asked to direct the Safety Organization to take a special note of the Wanchoo Committee's re-commendation and educate the drivers in regard to the correct observance of the various combinations of multiple- aspect signals.
88	In relation to the total service of errant drivers, we find that the largest number of instances involved drivers with less than 5 years' service followed by drivers whose length of service ranged from 5 to 10 years. Drivers with more than 15 years of service were involved in disregard of signals oftener than those with service ranging from 10 to 15 years. This phenomenon presents another useful field for study for the Psycho-Technical Cell.	**Initial views:** Noted. Psycho-Technical study of the effects of ageing on drivers has already been carried out and a programme of counselling drivers in the age group of 45 plus has been drawn up as a result of this study.
89	We consider that a driver who disregards	It would be possible to remove the driver

	a signal is an incipient accident maker and should be classified 88 accidents prone. Public safety demands that he should not, as far as possible, be placed on driving duty therefore.	from footplate in all cases of signals passed at danger. Instructions have already been issued that in all such cases normally a major penalty should be imposed. As such no further action is considered necessary.
90	We find that of the 682 drivers held responsible for the disregard of signals, over 60 per cent were in the age group of 45 years or less. More than half of the drivers, 367 in all, were using spectacles. These figures also furnish useful data for a clinical study of drivers by the Psycho-Technical Cell.	A study on the lines of the recommendations made by the Wanchoo Committee and the Railway Board's initial views thereon was made by the Psycho-Technical Cell. The observation of the Wanchoo Committee that the drivers. in the age group of 45 years and above were less vulnerable to disregard of signals than those below 45 years could not be substantiated. Instead, the former were found to be more vulnerable to the said lapses. In this context, the pilot project on periodical psychological checkup of Mail/Express drivers aged 15 years plus and their counselling, formulated by the Psycho-Technical Cell, was pursued with

		a great sense of urgency. A following of this programme revealed that the drivers who are given appropriate counselling on their having shown ageing effect on "Form Perception" ana "reaction time" registered on improvement in their safety and time kipping record. Such an improvement occurred in about 76 per cent cases. The Railway Board have approved the programme and necessary action is being taken to enforce the scheme on all the Zonal Railways. In regard to association between dis regard of signals and e f spectacles by drivers, the study confirm that drivers using spectacles showed higher incidence of disregard of signals. As the problem required investigation Medical Experts, having necessary experience in the field, the Central Labour Institute. Bombay (Union Ministry of Labour) were asked to investigate the problem further. They took

		about two years to make a preliminary assessment which did not indicate any clear trends. It was therefore decided to tackle the problem departmentally with the assistance of Medical department. A report in this connection was sent to the Railway Board on 22.4.76; further an exhaustive study covering all the possible causative factors to arrive at definite conclusions, The study is under progress in collaboration with the Medical department of the Northern Railway and the report is expected to be finalised very soon.
91	There was a marked reduction in the number of averted collisions on both the gauges during the last five years as compared with the six years ending 1962-63.	This is an observation. No action was considered to be necessary.
92	The largest number of averted collisions occurred between 'two trains including between a train and a light engine' on	Remarks furnished against Item 12 and 16 would hold good in this case also. No further action is considered necessary.

	both the gauges. Next came averted collisions between 'a train and a rake or vehicles or load stabled on a running line'. This highlights the need for enforcing the use of lever and slide collars until track circuiting becomes available.	
93	The incidence of each type of averted collisions was higher on the broad gauge as compared to the meter gauge.	This is an observation. No action was considered to be necessary.
94	We find that of the staff found responsible for averted collisions, nearly 78 per cent were trame staff and 14 per cent loco running staff.	This is an observation. No action was considered to be necessary.
CHAPTER III- SERIOUS ACCIDENTS DURING THE YEARS 1963-64 TO 1967-68 CAUSES AND CONSEQUENCES		
95	During the years 1963-64 to 1967-68, 79 serious accidents occurred on the Railways. In 78 of these accidents, statutory inquiries were held by the Commission of Railway Safety and in	This is an observation. No action was considered to be necessary.

	one case by a commission appointed under the Commissions of Inquiry Act, 1952.	
96	The serious accidents during the last five years constituted 1 per cent of the total number of important accidents; these contributed 89 per cent of the deaths, 61 per cent of the injuries and 19 per cent of the damage caused by all the important accidents involving passenger and goods trains.	This is an observation. No action was considered to be necessary.
97	The number of serious accidents increased from 74 in the five years-1957 to 1962 to 79 in the five years 1963-64 to 1967-68.	This is an observation. No action.
98	The accidents attributable to failures of drivers and station staff, sabotage and accident at level crossings were equal in number, namely, 56 during the two live year periods.	This is an observation. No action was considered to be necessary.
99	99. A study of the 56 accidents during the years 1963-64 to 1967-68 reveals that:-	

	This is an observation. No action was considered to be necessary. **(a)** the drivers caused 38 per cent of these, either by disregarding signals or by running at excessive speeds or by violating other safety rules. **(b)** Station staff were responsible 1er 23 per cent of these by incorrect setting of points or by receiving trains on sections: or despatching blocked lines or **(c)** 30 per cent of these resulted from wilful tampering with track or other acts of sabotage; and **(d)** 9 per cent were level crossing accidents for all of which road users were found to be responsible.	
100	The number of serious accidents due to failure of drivers and station staff for defects in track, rolling stock, engines and fires in trains registered a reduction during the last five years as compared to the preceding five years.	This is an observation. No action was considered to be necessary.

101	The increase in the number of serious accidents was almost entirely due to rise in the number of cases attributable to acts of sabotage, failures of road users and other miscellaneous causes, like rash acts of outsiders, natural calamities, explosions and undetermined causes.	This is an observation. No action was considered to be necessary.
102	The increase in the number of accidents caused by tampering with track or other acts of sabotage is a continuance of rising trend over the last 15 years which rose from 6 cases In the years 1952-57, to 12 cases in next five years, and to 17 during the years 1963-64 to 1967-68. This evidence of lawlessness in our national life cannot but be viewed with dis quiet.	The following measures have been taken to prevent tampering with track or other acts of sabotage:- **(i)** track partrolling by Railway Protection Force (11,000) and gangmen (13,000) was introduced in sensitive areas; **(ii)** besides patrolling of the track in vulnerable sections by Rail Protection Force and gangmen, Gujarat, Maharashtra, Uttar Pradesh, Punjab and Haryana mobilized State Police personnel/Home Guards/ Village Chowkidars for patrol-ling the track in sensitive areas) **(iii)** State Governments of Punjab and Haryana invoked the previsions of Village

		and Small Town Patrol Act, 1918, thereby asking villagers to keep a watch on the track: **(iv)** important cases of sabotage are being investigated by special squads of the CID of the concerned States; and
		(v) The State Governments have also geared up the intelligence machinery. Close liaison is maintained with all investigating and intelligence agencies, as well as the Special Cell in the Intelligence Bureau (Ministry of Home Affairs). At all levels, available information is frequently exchanged so that coordinated efforts are made to prevent and detect cases of sabotage. **(vi)** Due to timely action taken by Railway Protection Force and gangmen patrolling the track since November, 1977, 26 cases of tampering with track were promptly noticed fill March 1978 which led to prevention of serious accidents.

103	The large increase in the number of casualties in serious accidents during the last five years as com- pared to the preceding 5 years was mainly on account of the two accidents on the Northeast Fron- tier Railway due to sabotage and a case in which the whole train was washed away by a tidal wave on the Southern Railway.	This is an observation. No action was considered to be necessary.
CHAPTER IV- AN APPRECIATION OF THE RECOMMENDATIONS MADE BY THE KUNZRU COMMITTEE AND OF ACTION THEREON		
104	A precise assessment as to what extent the declining tendency in the incidence of accidents was a direct result of the implementation of the recommendations of the Kunzru Committee is difficult to make Nonetheless, it is clear that the recommendations of the Kunzru Committee did make an impact in promoting safety in train operation on the Railways during the last five years.	This is an observation. No action was considered to be necessary.
105	**(i)** Our review of the more important of	This is an observation. Ne action was

	the recommendations made by the Kunzru Committee is based primarily on the information furnished to us by the Rail- way Board; out wherever we had in our possession data relevant to the implementation of any of the recommendations gathered either from the Railway Administrations or from other sources, such data have been used to amplify our comments.	considered to be necessary.
105	**(ii)** The other observations of the Kunzru Committee which are factual in nature or are suggestions which emphasize the observance of existing procedures and practices have been placed in an Appendix along with action taken as reported by the Railway Board and without our comments there on.	This is an observation. No action was considered to be necessary.
STAFF		
106	(i), (ii) (See Chapter IV, Para 149).	
107	We find that while on some of the Railways no educational qualifications	**Initial views:** Necessary instructions were issued by the

	have been laid down for switchmen, on others different standards of education have been prescribed.	Railway Board in May 1967 prescribing minimum educational qualifications fer switchmen. **Final views:** Since then, there has been no change in the position.
108	We are unable to appreciate the wide variations in the duration of initial and refresher courses on different Railways for certain categories of sail. We suggest that a uniform practice in this regard should be adopted on all the Railways taking into account the requirements of the average employee in each category.	The Railway Board have accepted these recommendations and prescribed the standard syllabi for the staff in following departments for uniform application on all the Railways:- **Mechanical Department.** No. E (Trg)-73(30)14 dated 3rd April, 1976. **Civil Engineering Department** **1.** (Trg)-73(30) 16 dated 4-3-1974 **2.** E(Trg)-75(30)1 dated 17-1-1975 **3.** E T(Trg) - 74(30) 15 dated 15-5-1976. **Stores** E(Trg) - 73(30) / 17 dated 3-1-1974. Electric E(Trg) - 73(30) / 18 dated 7-4-1975. **Singnalling and Telecommunication**

		1. E(Trg) - 73(30) / 13 dated 29 - 8 - 1975 **2.** E(Trg) - 76(30) / 30 / 2 dated 12-8-1977. **Operating** **1.** E(Trg) - 72(30) / 13 dated 19-12-1972 **2.** E(Trg) - 72(30) / 11 dated 22-12-1972 **3.** E(Trg) - 72(30) / 9 dated 30-12-1972 **4.** E(Trg) - 74(30) / 9 dated 7-9-1974 **5.** E(NG) I - 74 - C * FP / 45 dated 3-10-1974 **6.** E(Trg) - 75(30) / 16 dated 24-11-1975 The standard syllabi are being applied on all the Railways.
109	We consider that certain minimum educational qualifications and the duration and nature of training to meet the job requirements should be prescribed for the maintainers who have actually to maintain the sophisticated signalling gadgets. We find that at present, there is no uniformity on the different Railways. The frequency of re- fresher training for	**Initial views:** Minimum educational qualifications both for direct recruitment as also for promotional categories have already been prescribed in the Indian Railways Establishment Manual. The frequency of refresher training has also, been prescribed. **Final views:** No fresh action is considered

	them also needs to be specified.	necessary.
110	It is necessary that the training of staff should be examined in all its aspects, stream lined and rationalized.	Same remarks as against Item 108.
111	We find that many Instructors in the Training Schools are those who had been selected on ad hoc basis. We were informed that many of them are "rejects" from the open line. Some of the Instructors in the Schools are there for more than a decade. We consider these aspects unhealthy and suggest that only persons with outstanding record of work to their credit on the open line should find their way into the schools as Instructors. In our view, the tenure of Instructors should be three to five years so that training in the schools is not divorced from practical working on the line.	It has been reiterated that the tenure of Instructors should be for four years.
112	We find that in heads of the some cases the Zonal Training Schools remained at their pests for less than three years. We	This being an observation was noted. In October, 1967, General Managers were advised demi-officially that the heads of

	some that whenever such pre-transfers are ordered, the interests of training of staff are kept in view.	training establishments should be hand-picked officers with good record of service. They were also, requested to make a quick review of the present incumbents of the posts. The matter was, therefore, reviewed to ensure that officers considered suitable for the assignments are posted as Principals of the Zonal Training Schools on the Railways. It was considered that only in a few cases there would have been transfers within 3 years and such transfers would have been effected in the administrative interest.
113	There is no uniformity in the practice of giving refresher courses to certain categories of staff on the different Railways. We consider that the categories of staff in need of refresher training should be given such training on all the Railways without any exception.	Same remarks as against Item 103.
114	(See Chapter IV, Para 155)	
115	(See Chapter IV, Para 185)	

116	(See Chapter IV, para 190)	
117	(See Chapter IV, Para 195)	
118&119	(See Chapter IV, Para 175)	
120&121	(See Chapter IV, Para 200)	
122	122. We are informed that the procedure for recruitment of Class IV staff is cumbersome and results in delays. We are of the view that this aspect needs consideration and simplification of procedure for recruitment of Class IV staff and elimination of undue restraints in this behalf would be a step in the right direction.	Class IV vacancies on the open line are now filled from Casual Labour after screening by a Committee of two railway officers and direct recruitment from open market is seldom resorted to, except in workshops.
123	There was a unanimity in the views furnished by the Railways and the evidence tendered before us emphasizing the need for giving weightage to the sons of rail way employees for recruitment to Railway service in order to ensure loyalty and efficiency through continuity of tradition of service We shall advert to this in Part- II of our Report.	Noted, No action was considered to be necessary.

124	We find that the Northern Rail- way has fixed the percentages for direct recruitment in case of traffic apprentices and assistant signal and block inspectors higher than the respective percentages prescribed by the Railway Board. The Railway has not furnished any reason for adopting the enhanced percentages	**Initial views:** In respect of Traffic Apprentices, the actual percentage of direct recruitment adopted by the Northern Railway is only 25 which is in accordance with the percentage prescribed by the Railway Board. In regard to Assistant Signal and Block Inspectors, the percentage of 66-2/3 which was in force on the Northern Railway has since been changed to 40 per cent, which is in accordance with the Railway Board's orders. It will also be noticed that in both these cases the actual quantum of recruitment on the Northern Railway has been well within 25 and 40 per cent respectively. **Final views:** No fresh action is called for.
125	We find that the Railways have in several cases made direct recruitment in certain categories in excess of the percentages prescribed by the Railway Board. In our view, direct recruitment should be	No excess recruitment has been made by the Railway Administrations.

	regulated judiciously so that reasonable chances of promotion of staff already in service are not diminished in a particular year as is likely to be the case if an al- tempt is made to clear the accumulated deficiencies in one or two years.	
126	(See Chapter IV, Para 79)	
127	(See Chapter IV, Para 207)	
128	In our view, the programme of personalized training on man-to-man basis needs to be re-oriented with an emphasis on the personal contact and understanding between the officer or supervisor and the individual worker and specific in- dividual attention to the latter.	This recommendation is linked with recommendation No. 40 in Part I of the Report of the Railway Accidents Committee, 1962, for which instructions were issued to the Railways vide Rail- way Board's letter No. E(Trg)/62/TR1/ 14 dated 7-3-1963. Since the recommendation is of continuous nature, instructions were once again reiterated to the Railways vide Railway Board's letter No. 69/Safety/RAIC-68/128 dated सन्यव3-6-1969 desiring that the functioning of the safety counsellors be directed on the lines envisaged when these posts were created

		and to see that they net only function as intended, but their image is also rehabilitated.
129	(See Chapter: IV, Para 94)	
130	We find that nearly 60 per cent of the employees held responsible for causing two or more accidents were in the category of drivers. In our view, this study may provide a pointer for psychological counselling and rational persuasion of these and other staff so that in future they may be able to render a relatively accident free service.	**Initial views:** Necessary action on these lines has already been initiated. RDSO were asked to make a detailed personality study of drivers involved in disregard of signals with a view to locating causative factors and charling appropriate line of action.
131	(See Chapter IV, Para 163)	
132	The morale of officers and impact it has on the running of an organization are indeed matters to which we attach great importance. Instances of intervention by Influential outsiders in routine decisions taken by officers were brought to our notice. We agree that such factors inevitably tell on the morale of officers	Noted. No action was considered to be necessary.

	and their disposition to take right decisions. We intend to give further thought to this in Part II of our Report.	
133&134	(See Chapter IV, Para 75)	
135&136	(See Chapter IV, Para 107) Safety organization rules and other operating matters.	
137	We are informed that the functions performed by the Safety Organization are in the nature of "internal audit" on the aspects concerning safety in train operation and are highly useful and important.	Merely an observation. No action was considered to be necessary.
138	We have been advised that the Railway Board have appointed a Committee of officers recently to go into the general rules with a view to revising and simplifying these. We hope that the views expressed by the Kunzru Committee about the multiplicity of rules and the need for standardizing the working practices will be kept in view while	No action was considered to be necessary.

	revising the rules.	
139	In our view the minimum distance necessary for the protection of a trolley or a lorry should be uniform on all the Railways.	Relevant General Rules were amended vide notification No. 68/Safety/ 29/6 / (53) dated 5-10-1970 to lay down mini- mum distances necessary for protection of lorries and trolleys, on a uniform basis, on the Railways.
140	We find that from the anomalies and the deficiencies in the Working Timetables of the Railways pointed cut by the Kunzru Committee still persisted in the April 1968 issues. We urge that the Working Timetables should be subjected to a thorough scrutiny before issue so that such anomalies and deficiencies do not recur.	The margin of about 10 per cent is kept between the booked and maxi- mum permissible speed unless a lower margin is specifically sanctioned by the Railway Board. Since the Working Timetables are prepared and notified every six months, a review is always carried out of the various information contained so that the same are up- dated with the fresh issue. Whenever specific cases of anomalies are brought to the notice of this Ministry, suitable action is taken to have the same rectified.
Permanent Way		
141	(See Chapter IV, Para 249)	
142	(See Chapter IV, Para 221)	

143	(See Chapter IV, Para 225)	
144	(See Chapter IV, Para 229)	
145	(See Chapter IV, Para 246)	
146	(See Chapter IV, Para 269)	
147	In our view the replacement of the mate's diary by the 'gang inspection register was quite unnecessary. We are informed that instructions have since been issued dispensing with 'gang inspection register'.	This was an observation. No further action was called for in view of Rail- way Board's letter No. 68/ W l/ TK/ Register dated 2-9-1968.
148	We consider it important that the results of the trials of the improved methods of track maintenance, like measured shovel packing', directed maintenance, etc. are assessed early so that the Railways may be in a position to modernize their methods of maintenance of permanent way.	Various trials to assess the improved methods of maintenance have been introduced, and as a result of that these methods are progressively being introduced on more and more length of track.
149	(See Chapter IV, Para 284)	
150	(See Chapter IV, Para 292)	
151	(See Chapter IV, Para 289)	
152	We find that the RDSO was asked to look into the question of track recording	Two track recording trollies were pro- cured from abroad. However, track

	trollies only recently in April 1968. It seems that action on this part of the recommendation of the Kunzru Committee had not been taken earlier. We understand that the proposal has since been given up.	recording cars were considered superior in performance and as such the proposal regarding track recording trollies was dropped:
153	(See Chapter IV, Para 306)	
Level Crossings		
154	We are of the view that the five yearly censuses should not given up.	Instructions have already been issued to the Railways vide Railway Board's letter No. 64/W1/LX/39 dated 9-3-1971 to conduct periodical census of traffic at each unmanned level crossing and census-cum-job analysis at each manned level crossing once in five years. These instructions are being followed on the Railways.
155,156 &157	(See Chapter IV, Para 316)	
158	(See Chapter IV, Para 338)	
159	We consider the amendment to Motor Vehicles Act in States making it	Instructions have been issued by the Ministry of Shipping and Transport vide

	obligatory for drivers of passenger buses before passing an unmanned level crossing to stop and to cross them with the conductor of the bus walking ahead of the bus a wise provision and hope that the violation of this pro- vision of the Law would be sternly viewed and the offenders brought to book.	their letter No. 37 / T * AG / (43) / 69 dated 25-7-69 to all the State Governments/Union Territory Administrations that they should take positive steps to enforce strict adherence to the law by the driver of the passenger buses and to proceed sternly against those violating the law. Railways arrange to conduct surprise inspections jointly with the State Governments periodically, at unmanned level crossings, as a preventive drive against violations of the law.
160&161	(See Chapter IV, Para 342).	
162	(See Chapter IV, Para 332).	
163	In our view, it is desirable that the responsibility for avoiding accidents should rest with the road users in the case of unmanned level crossings. We would not, therefore, advocate installing of bells and road flasher signals as it would result in unnecessary waste of money without comparable advantage in the matter of	The Railway Board vide their letter No. 62/ W3/SG/116 dated 15-9-1970 directed the Railways that warning bells and flashing lights may not be provided at any more unmanned level crossings.

	avoiding accidents in our conditions.	
	Signalling	
164	The, assurance given by the Rail- way Board that all signalling and interlocking works brought for- ward from Second Five Year Plan and those included in the works programmes during the first three years of the Third Five Year Plan would be completed by the end of the Third Five Year Plan has not been completely fulfilled. The factors enumerated for delay cannot be deemed as unanticipated or such as could not be visualized, a the time of planning and programming these works.	All such works have been completed.
165	(See Chapter IV, Para 407).	
166	We find that a number of stations on the double line on some Railways are either not provided with block instruments or are provided with block instruments with control on last stop signals only and not	**Initial views:** The recommendation of Kunzru Committee in regard to provision of lock and block' working on double line sections has already been implemented. The sections referred to by the Wanchoo

	complete lock and block working. We feel that the recommendation of the Kunzru Committee in this behalf should have been fully implemented long ago in the interests of safety.	Committee as not having been provided with complete lock and block' working are mainly the new lines on sections under doubling, where the newly laid line is worked as slow line. Such sections will be provided with lock and block' working when converted into proper double line sections. **Final views:** nil
167	(See Chapter IV. Para 358).	
168	We consider the achievements in respect of the provision of modern techniques of signalling to be in- adequate in view of the increasing speed and density of traffic. In our view, the recommendation of the Kunzru Committee assumes urgency with the increasing intro- duction of diesel and electric traction and running of heavier trains at higher speeds. We urge that special efforts should be made to accelerate the progress in the use of modern signalling techniques.	**Initial views:** The progress in regard to provision of modern techniques of signalling has necessarily been restrict- ed in its scope on account of the limit- ed availability of foreign exchange and the capacity of indigenous firms for manufacturing sophisticated signalling equipment. Nevertheless, special efforts will continue to be made to accelerate the pace of modernization taking advantage of indigenization. **Final views:** (As advised to this

		Committee by the RDSO: Execution of works with modern signalling techniques depends upon the works sanctioned and funds provided by the Railway Board. Substantial percentage of modern signalling equipment are now indigenously produced.)
169	(See Chapter IV, Para 375). Rolling Stock	
170	(See Chapter IV, Para 389).	
171	(See Chapter IV, Para 412).	
172	(See Chapter IV, Para 416).	
173&174	(See Chapter IV, Para 420)	
175	We suggest that the final trial of an overhauled locomotive should be carried out, as far as possible, at a speed 5 to 10 per cent higher than the maximum permissible speed of the locomotive, and a speedometer used for the purpose.	**Initial views:** Maximum permissible speeds of locomotives are fixed on the basis of oscillation trials which reveal the inter-action between the locomotive and the track. In the speed range higher than the maximum permissible under uncontrolled conditions, there is danger of derailment. Moreover, after periodical overhaul, the trials are conducted

		essentially to ensure that all assemblies and fittings are functioning properly and to run in the bearings of the locomotives. It is, therefore, not advisable to run trials of locomotives after POH at speeds beyond the maximum permissible. As regards fitting of speedometers during trials, instances already exist that locomotives which are normally required to have speedometers should be sent out on trials after overhaul with speedometers in working order. **Final views:** in view of the above, no further action was called for.
176&177	(See Chapter IV, Para 364).	
178	(See Chapter IV, Para 438)	
179. (i), (ii)&180	(See Chapter IV, Para 430).	
181	We find that the handbooks for drivers in use on the Eastern and the Northern Railways do not contain information about the defects likely to develop on	The Northern Railway has issued a trouble shooting Handbook for drivers. This covers the common defects likely to develop on the locomotives on run. The

	engines on the run, The North-east Frontier Railway has yet to bring out a handbook for drivers.	Eastern Railway has also taken the necessary action.
182	(See Chapter IV, Para 465).	
183	(See Chapter IV, Para 471)	
184	**(i)** (See Chapter IV, Para 583). **(ii)** (See Chapter IV, Para 595).	
185&186	(See Chapter IV, Para 519).	
187	(See Chapter IV, Para 555).	
188&189	(See Chapter IV, Para 602).	
190	We note that there has been an improvement in respect passenger train partings of on both the gauges. There has also been a considerable improvement in the incidence of goods train partings on the broad gauge and a slight improvement on the meter gauge. We hope that the measures which brought about the improvement in the position of train partings will be sustained and intensified.	Instructions were issued vide Railway Board's letter No. 68/M(N) 7/8 dated 3-1-1969 and followed up by further instructions since then to the effect that measures to reduce train partings should be sustained and intensified. These efforts are continuing. On the basis of experience gained, RDSO has evolved an im- proved design of meter gauge draw bar (larger diameter) and springs metal bounded (Rubber springs of higher capacity than the earlier steel springs).

	Stores, post-accident relief measures and other matters.	
191	We consider that though there has been some improvement in the availability of stores, there is considerable scope for further improving the position,	Railways have been instructed to submit quarterly efficiency statistics from the stores department which includes percentage compliance of demand of purchase components and shop manufactured components. The position of compliance percentage could improve only slowly as there are constraints such as ban on creation of ministerial posts. The takeover of the purchase work from the DGS&D has also been authorized by the Government on the understanding that no extra staff will be created either in the Railway Board's office or on the Railways.
192	In our view, the over-dependence of the Ministry of Railways on the Directorate General of Supplies and Disposals for their requirements and the effect this has on the availability and procurement of	As decided in consultation with the Ministry of Supply, the purchase of items specially required by the Rail- ways have been taken away from the DGS&D, and out of these items only a selected group of

	stores is a matter of considerable concern.	18 items have been kept for centralized purchase by the Railway Board, the remaining are being procured directly by the Railways.
193	We find that while the extant rules do not preclude non- acceptance of the lowest tender if it is otherwise not acceptable, in practice such discretion is rarely used in favour of reliable firms. We feel that a bolder attitude in such cases will be in public interest.	Instructions were issued vide Railway Board's letter No. 68/RS(G)/645/1 dated 28-6-1969 indicating that the extant rules did not preclude passing over of the lowest tender on the various grounds but specific reasons should be recorded when the lowest tender is not accepted. There is no ground to feel that the lowest tender, not acceptable on specific grounds, continue to be accepted merely because the offer is the lowest. In this connection it is pointed out that the decision to purchase in all cases above Rs. 50,000/- is based on Tender Committee recommendations where the members on the executive and procurement side have a direct responsibility to ensure the availability of proper materials. Such being the case

		these officers will always ensure consideration of the offers in the light of the possible timely availability of the same consistent with the quality requirement and are not likely to be influenced by the sole criterion of lowest quotation. On the other hand it is also to be pointed out that merely because a tenderer has quoted the lowest rate, it does not mean that the material offered will not be of the acceptable quality.
194	We found that some of the Rail- ways were ignorant of the existence of the standardized lists of safety items of stores as prescribed by the Railway Board. We hope the Railway Board would clarify the position to the Railways.	Vide Railway Board's letter No. 68/ RS(G)/645 dated 13 - 3 - 1969 linking the earlier letters issued on 18-1-1963 and 20-6-1963 under which list of safety items were sent to the Railways, the Railways were requested that supply of the safety items should be uninterrupted. Under Railway Board's letter No. 68/RS(G)/645 dated 28-5-1969 comments of the Railways were called for to re-examine the lists of items in the context of

		augmentation of newer types of rolling stock. Under letter No. 68/ RS(G)/645 dated 11 - 6 - 1970, the final list of safety items was issued, and Railways were instructed to amplify the lists giving NL Card number and to circulate the list to their units, such as running sheds, etc., to see that at no time such items were out of stock.
195	We consider that inventory control in an enormous undertaking like the Indian Railways is a vital factor. It is apparent that modern methods will have to replace many of the old stores procedures.	Under the Chairmanship of the then Minister of State for Railways, Shri M.S. Qureshi, a High-Powered Committee on Inventory Management was constituted to go into all the aspects of Materials Management and the Committee had given their first Report in 1976 and the Final Report in April 1977. The recommendations of the Committee have been accepted by the Government, and in case of review of organization, training pro- gramme, lateral requirement etc. the decisions are under implementation by

		sub-committees. In this connection it is however, pointed out that the augmentation of the staff strength of the Stores department on the Railways will not be possible in view of the Government's ban on creation of ministerial posts chargeable to Demand No. 4 to which the pay and allowances of staff of the Stores department are chargeable.
196	It would appear that the measures suggested to prevent tampering with track have proved ineffective. We are not unaware of the complex and difficult nature of this problem. We would urge that the steps for the security of the track against the dangers posed by the saboteurs will have to be preserved in and implemented with vigour. In our view, there must be close and continuous coordination between the Ministry of Home Affairs, State Governments and the	Following measures have taken to prevent tampering with track or other acts of sabotage: - **(i)** Track patrolling by Railway Protection Force (11,000) and gangmen (13,000) was introduced in sensitive areas. **(ii)** Besides patrolling of the track in vulnerable sections by Railway Protection Force and gangmen, Gujarat, Maharashtra, Uttar Pradesh, Punjab, and Haryana mobilized State Police personnel/ Home Guards/Village Chowkidars for patrolling

	Railways if the designs of the saboteur are to be kept under restraint if not thwarted.	the track in sensitive areas. **(iii)** The State Governments of Punjab and Haryana have invoked the provisions of Village and Small-Town Patrol Act, 1890, thereby asking villagers to keep a watch on the track. **(iv)** Important cases of sabotage are being investigated by special squads of the CI.D. of the concerned States. **(v)** The State Governments have also geared up the intelligence machinery. Close liaison. is maintained with all investigating and intelligence agencies as well as the special cell in the Intelligence Bureau (Ministry of Home Affairs). At all levels, valuable information is frequently exchanged so that co- ordinated efforts are made to prevent and detect sabotage cases; and **(vi)** Due to timely action taken by Railway Protection Force and Gangmen patrolling the track, since November 1977, 26 cases

		of tampering with track were promptly noticed till March 1978, which led to prevention of serious accidents.
197	We find that the work of rewiring of some coaches according to the revised wiring circuit remains to be completed on the Western Railway.	The work has since been completed.
198	We hope that the Kunzru Committee's recommendations in regard to the replacement of 4-wheeler medical vans with the bogie medical vans will be fully implemented within the shortest possible time.	All four-wheeler medical vans have been replaced by bogie medical vans.
199	(See Chapter IV, Para 607).	
200	**(i)** & **(ii)** (See Chapter IV, Para 611).	
CHAPTER V- RESEARCH DESIGNS AND STANDARDS ORGANISATION (RDSO)		
201	We find that the work done in the RDSO in recent years has been notable and we would like to record our appreciation.	Noted- No action was considered to be necessary.
202	We suggest that formal planning and	This practice is in force as far as

	allocations of resources should be arranged well in advance in respect of important items to avoid time lags.	practicable.
203	We feel that the recommendation of the Kunzru Committee regarding the bifurcation of the research organization into two separate research directorates is no longer a live issue as the range of expansion of the RDSO during the last five years has more than covered the field that the Kunzru Committee had in mind.	This is an observation. No action was considered to be necessary.
204	We consider that the equipment and capacity of non-railway research and technical bodies including Universities to undertake the solution of problems peculiar to Railways is very limited in India.	Noted- No action was considered to be necessary.
205	We agree that a 12-monthly frequency for meetings of the Central Board of Railway Research seems justified. We note that a three-year tenure of membership of this body has been adopted.	Noted- No action was considered to be necessary.

206	We find that the delays in finding Noted. solutions to certain problems highlighted by the Kunzru Committee have in most cases been overcome. We would stress that there should be no slackening of efforts for still further improvements, particularly towards greater safety in all aspects of railway working. We consider that in the case of sophisticated and costly items, special measures including utilizing the most expert advice obtainable are called for.	Noted.
207	We have satisfied ourselves that the Railway Board have given full weightage to the observations made by the Kunzru Committee for modernizing the techniques regarding the design and building of bridges.	Noted.
208	We find that there is a separate directorate in the RDSO which handles all aspects of signalling and is currently engaged in introducing several modern	This is an observation.

	developments.	
209	The need for Railways to colla- borate technically with foreign firms in the manufacture of electrical and signalling equipment in India is no longer as great as before due to growing in-deserialization in both the public and private sectors.	This is an observation.
210	(See Chapter IV, Para 630).	
211	In our view, the prescribing of a rigid percentage to be spent on the RDSO is not a feasible pro-position. We agree that rigid sub-division of budgetary allotments between the various section within the RDSO are also unnecessary.	Noted. No action was considered to be necessary.
212	We accept the view that suit- ability for discharging their duties efficiently plus some flair for designing and research should be the criterion for selecting railway officers for the RDSO. We urge that the Railway Ministry should do its best to staff the RDSO with the most	No further action is called for as this policy continues to be in force.

	suitable men available.	
213	213. We think that a period of 4 to 5 years should be the normal tenure of officers in the RDSO. We would leave the age of superannuation to be considered in the wider context of public and 'service' considerations.	This is already the policy. Regarding superannuation, no departure from Government's policy of normal retirement at the age of 58 years could be made.
214	We agree with the Railways that the creation of liaison organization in the RDSO for the purpose of carrying out test checks on the quality of maintenance and standards of manufacture of railway equipment on the Railways will tend to dilute the responsibility already placed on supervisory and inspecting authorities and also result in some duplication.	**Initial views:** Pursuant to the recommendations of the Kunzru Committee, inspecting officers of the rank of Deputy Directors have been posted to carry out test checks on the standards of manufacture of railway equipment, whether manufactured by the railway production units or by the Private Sector. These officers are not meant to check the quality of repairs executed by the Railways which is the Railway's own responsibility. **Final views:** In the light of the above views no further action was called for.
215	215. (See Chapter IV, Para 616).	

216	We consider that an early revival of the liaison between the RDSO and the manufacturers of railway equipment is very much in the interests of the Railways themselves.	**Initial views:** Necessary liaison is maintained. **Final views:** In the light of the above views no further action was called for.
217	We recommend that the results of the performance research studies, under actual working conditions, be carefully examined by the Railway Board, at Director's and higher levels for improving the standard servicing and maintenance practices on Zonal Railways.	Instructions were issued to the Rail- ways vide Railway Board's letter No. 69 / M(W) / 7 / 8 dated 14-10-1970 desiring that running shed and carriage and wagon depot should be brought under purview of works studies so as to improve methods of working with a view not only to improving the efficiency and productivity but also general condition of working. While formulating plans for undertaking work studies, it was desired that studies of sheds and depots should also be included. A watch is, however, being kept by the Railway board.
218	We agree with the Kunzru Committee that we should not hesitate to import equipment which is not readily available	**Initial views:** Accepted. Implementation of such measures will necessarily have to depend upon priorities and availability of

	in the country as otherwise we shall be depriving ourselves of the most progressive and up-to-date ideas embodied in such equipment.	foreign exchange. **Final views:** In the light of the above views no further action was called for.
219	We feel that there will be considerable advantage if experts in safety measures answering well on railways in advanced countries, can be invited to visit Indian Railways in the near future to give their appreciation of the present position and of how train operation can be made safer.	Noted. This is an observation, hence no action is called for.
220	We find that the Railway Board have accepted the recommendations of the Kunzru Committee regarding the status and powers of the Director General of the RDSO.	Noted. No action was considered to be necessary.
221	We suggest that the tenure re-commended for other responsible posts in the RDSO should also apply to its head, who should always be closely associated with the selection of individuals to fill important posts in the organization,	Adequate tenure is ensured for the incumbent of the post of Director General/RDSO within the policy of the Government regarding superannuation.

222	We express our appreciation of the detailed examination by the Kunzru Committee of various aspects of the RDSO and are of the view that many of the improvements made during the past five years in this organization largely due to this factor.	Noted. No action was considered to be necessary.

PART II
CHAPTER I- INTRODUCTION

1	Part I of our Report was devoted mainly to a review of the position of accidents on the Indian Railways since the appointment of the Kunzru Committee in the light of recommendations made by it and their implementation.	This is an observation, No action.
2	In this part of our Report, we have addressed ourselves to suggesting measures for further minimizing accidents.	This is an observation, No action.
3	We consider that the record of safety of rail travel on the Indian Railways must be judged in the context of the task that the Railways are called upon to perform. Any sweeping generalizations which may be drawn from our observations on specific issues, itemized for the sake of clarity, in the first part of our Report or in this part, would be unjustified.	Noted. No action
4	We do not wish our remarks to be taken to mean that nothing remains to be done to promote safety in rail travel. We feel that	Noted. No action,

	with increased axle loads, speeds and more intensive operation, the need for attention to the maintenance of track and rolling stock would be greater. The future may, therefore, necessitate a higher degree of safety precautions and conscious- ness than at present. The quest for safety in rail travel will, thus, have to be an unending one.	
5	Notwithstanding the use of modern technological safety devices, we believe that the steps which the Railway administration may take not only to instill a higher degree of safety consciousness in its men but also to raise the general level of morale and keep the sense of duty pitched at a high level will pay rich dividends.	Agreed. No action.
6	Apart from direct causes of accidents as brought out in the accident enquiry reports, we have addressed ourselves to the more deep-rooted factors which even though largely latent do, in course of time, give rise to conditions which cumulatively have the	The observation is noted. No action.

	effect of eroding whatever makes for organizational and individual efficiency; any drop in one or both of these assuredly makes an impact on the safety of rail travel.	
7	We have gone into matters whose link with train operations though seemingly indirect is, nevertheless in our view of a basic character, particularly the aspects concerning the human element as viewed from a wider perspective.	The observation is noted. No action.
8	We are convinced that the extent to which the Railway administration is able to locate and remedy the factors-whether latent or apparent, remote or direct-which give rise to failure of the human element, to that extent a greater measure of safety in rail travel would follow.	Noted. No action.
9	We wish to strike a note of caution against exaggerated notions of economy which on occasions are apt to assail the railways as accidents result not only in direct costs but in indirect costs also and to these costs got	The Railway Board have issued directives that the observations of the Wanchoo Committee may be brought to the notice of all officers concerned, particularly those connected with

	added the sufferings of the victims of accidents and the loss of the fair name of the railways which cannot be re-ckoned in terms of money.	planning and execution of works, with financial management and control.
CHAPTER II- YHE HUMAN ELEMENT		
10	We have, in Part I of our Report, shown that a large number of accidents is caused directly by failure of the human element. Even out of the remaining, a good number can be traced in- directly to the failure of staff to carry out properly their duties of maintenance of track, engines, rolling stock or signals. The mechanical devices and safeguards which may be employed by the Railway administration in its various fields of operation have still to rely for their operation or maintenance on the human mind and hand.	The observation is noted. No action.
		Items 12 & 13.
11	We are of the view that unless the standards of service discipline are of a high order, the eventual result of corporate effort would be	The recommendation is only an observation which is kept in mind. No specific orders have been issued in the

	indifferent and in a field of work like railway operation it would be attended with hazard.	matter.
		Items 12 & 13.
12	We are convinced that while the Railway administrations and their core of dedicated workers have striven hard to increase the measure of safety and to improve their performance generally, the position would have been better and the level of safety and efficiency even higher but for the factors which have affected discipline adversely.	The observations are of a general nature. No specific issue is involved which can be solved or answered by any executive order. The Railways have the normal D & A Rules (Discipline and Appeal Rules) to take up acts of indiscipline. Further, as far as labour relations are concerned, there exists proper negotiating machinery at all levels to sort out irritants and problems that arise.
13	We think that the factors which generate indiscipline among the staff have also an effect on the morale of executives; in fact, whatever engenders one makes for erosion of the other.	
14 to 19	(See Chapter IV, Para 63)	
20	We welcome the policy adopted both by the Railway Administrations and the recognized unions on the Railways of not favouring	There has been no change in the policy of the Government of not favouring sectional unions.

	recognition of sectional (category- wise) unions.	
21	**(i)** to **(iii)** (See Chapter IV, Para 63)	
22 to 26	(See Chapter IV, Para 67)	
27	We appeal to the Ministers that they should do all they can to insulate the officers within their charge from outside influence. We hope that the Minister of Railways would be equally anxious to sustain the morale of his officers and would set precedents whereby outside inter-cessions are eliminated.	Letters continue to be received from Members of Parliament etc., on matters concerning individual members of staff. These are dealt with according to the rules and procedures and replies are issued to the Members of Parliament in the normal course as per extant instructions.
28	We consider it would be a healthy practice if the Minister of Rail. ways were to lay on the table of both Houses of Parliament every quarter a statement giving the details about letters and representations received by him from Members of Parliament in the nature of intercessions on behalf of individual members of staff and indicating what, if any, action has been taken on them.	The Government consider that work involved in compiling and placing on the table of both Houses of Parliament such a statement would be voluminous in nature and might result in additional expenditure with no com mensurate advantage to public interest.

29	A more radical and fundamental method of eliminating political influence in such matters may be to convert the Railway Board into an autonomous statutory corporation as is the case in the United Kingdom. It is not, however, within the purview of this Committee to investigate into the pros and cons of this proposal and to pronounce on its desirability.	This is an observation, No action is called for.
30	The functioning of the vigilance organization and its role in its present form has engaged our attention. We cannot help observing that without any further loss of time, steps should be taken by the Government to undo the damage which has been done by the functioning of this organization which it might have once been thought, would root out corruption but which instead is throttling the healthy organism of the Railways. We would suggest action along the following lines:-	
(i)	While nothing must be left un- done to root	This item in the summary of

	out corruption in whichever quarter it may exist, it should be understood that this duty devolves squarely on the Railway administration itself and not on any organization which has the semblance of an outside policing organization. It equally devolves on the administration to protect honest and innocent officials from allegations by un- scrupulous persons who may be nurturing grievances against their superiors or fellow workers.	Recommendations was an observation made by the Railway Accidents Inquiry Committee, 1968 in passing. However, anonymous/psedonymous complaints are straightaway filed and no action is taken thereon. As regards action on other complaints which appear to be genuine, investigations are taken up only after verifying the genuineness of the complainant. In cases where it comes to notice after investigations or after the departmental inquiry against the alleged railway servant that the complainant had deliberately made a false complaint with malicious intent, disciplinary action is also invariably taken against the complainant.
(ii)	No investigation should be taken in hand against any rail- way official, including a gazetted officer, without the concurrence of the head of the branch or of the organization corresponding to the status of the official	The Head of the Department/Divisional Superintendent, whosoever may be concerned in relation to the officer alleged against, is advised about the complaints received and the

	against whom there is a complaint. While we would like to leave the procedure in this behalf to be settled by the Railway administration, we would as a broad guideline, suggest that for a class III employee other than a senior supervisor, the concurrence of the Divisional Superintendent (or an authority of an equivalent rank in the case of other than the divisional employees) should be obtained. For investigations against a senior supervisor, the prior concurrence of the Head of the department concerned should ordinarily be taken. In respect of an officer working on a Rail- way administration, the General Manager should be taken into confidence besides the concurrence of the Member concerned of the Railway Board. In seeking such concurrence, all the mate- rial available on the basis of which the case for investigation is sought to be made out should be placed before the competent authority and if the latter after	investigations are proposed to be undertaken so as to order the views with regard to the integrity and general reputation etc. of the officer. In case there is difference of opinion between the Chief Vigilance Officer and Head of Department regarding investigations to be taken up, the matter is placed before the General Manager whose decision is final in the matter. Similarly, the investigation report is also referred to the Head of Department to obtain his views on the facts as revealed during investigation. They are generally asked to furnish their comments within a period of 15 days.

	considering the material finds that there is no case for investigation, the matter should not be pursued further and the discretion so exercised should not ordinarily be questioned.	
(iii)	While we commend the directive that no notice must be taken of annonymous or pseudonymous complaints, we are of the view that the purpose behind this directive is set at naught by initiating Investigations on 'source' information. We depricate the practice of accepting such information. Such information should, except in extraordinary circumstances, not be given any credence. Only in very exceptional circumstances and that too when the authority competent to give concurrence for initiating investigation has personally satisfied himself as to the antecedents and motives of the informer may notice be taken of such information.	All the Railways were advised (No. 74/Vig. Comp. 1/1 dated 12-11-74) that they must invariably verify the bona. fides of the 'source' before taking up investigation on the 'source' information received. Decision for taking up investigation into 'source' information is generally taken by Chief Vigilance Officer himself.
(iv)	In the Railway Board, the Directorate of Vigilance should be headed by a railwayman	Consequent upon the restructuring of the Railway Board done by the present

	of considerable experience and proved integrity who should have the rank of a Director functioning directly under the Member Staff. We do not consider that there is any justification for the post of the Director General (Vigilance).	Minister, the post of Additional Member (Vigilance) has since been down- graded and redesignated as Director (Vigilance) who is also the Chief Vigilance Officer for the Ministry of Rail- ways. The Director (Vigilance) is an officer from the IRSE cadre and is an officer with sufficient experience of railway working.
(v)	In the Vigilance Organization, both in the Railway Board's office and in the Railway administrations, the lower officers and inspectors should all be railwaymen having excellent record and reputation for integrity and a flair for investigation. In our view, the police Inspectors and officers who have little knowledge of rail- way working and who, in an organization like the Railways would have problems of adjustment, do not have any utility in the Vigilance Organization.	One officer of the rank of Additional Director (Vigilance) and another of the rank of Deputy Director (Vigilance) in the Vigilance Directorate, Railway Board, are drawn from the IPS and also a few inspectors are drawn from the State Police. Similarly on all the Railways, except North-Eastern and Northeast Frontier, an officer of the rank of Assistant Vigilance Officer (Class II) is still generally drawn from the State Police keeping in line with the recommendation made by the Committee on Prevention of Corruption

		1962-63 (Santhanam Committee) and also to ensure closer liaison with the State Police and the CBI etc., and to take advantage of their skills in laying traps.
(vi)	We welcome the assurance given to us by the representative of the Special Police Establishment that preventive checks not based on any specific complaints have been discontinued. We wish to record that such checks do not serve any purpose and if these have been discontinued, these should not be revived.	This recommendation has since been accepted and generally preventive checks are not carried out by the SPE unless there are specific complaints of corruption in certain sensitive areas of railway functioning. In any case this concerns CBI who are outside the control of Railway Ministry.
31	We would suggest a self-imposed ordinance by the Central Vigilance Commission that only cases of officers in the Senior Administrative grade and above should be scrutinized by the Central Vigilance Commission. Cases of other officers should be left to be dealt with by the Ministry of Railways themselves.	In view of the Resolution No. 24/7 / 64 dated 11-2-1964 passed by the Government of India (Ministry of Home Affairs) the CVC has the jurisdiction and powers in respect of all matters to which executive powers of the Union extends for undertaking enquiry into any transaction in which a public servant is suspected or alleged to have acted in a corrupt manner or cause an enquiry or

		investigation to be made into any complaint alleging corrupt practices on the part of any public servant. The Commission, however, being a one man Commission has imposed a self-restraint inasmuch as it normally does not require a report into the investigation made against the Non-Gazetted public servants, including railway servants against whom any complaint alleging corruption have been investigated by the SPE or the departmental Vigilance. However, the Commission can still call for reports in any such non-gazetted cases if they so desire. As regards corruption cases against Gazetted Officers, the Commission have not made any distinction between the Gazetted Officers, of different categories and status and as per the procedure in practice till today, the results of investigation into all complaints alleging

		corruption on the part of any gazetted public servant, including railway servants have to be referred to the CVC for their first stage advice with regard to the disciplinary action, if any, to be instituted against the officer(s) involved. After the departmental enquiry into charges framed has been held, which is generally held by a CDI working under the CVC, the Commission also advise regarding whether the charges has been proved and if so, what penalty (broad guidelines only are given) should be imposed CVC's advice in this regard is, however, advising only. The position as prevalent has been given. The scope of the recommendation basically concerns CVC which is outside the control of this Ministry.
32	In our view what is provided for in Article 311 of the Constitution is a time-honoured protection. We would, therefore, abstain	Noted. No change in the position.

	from recommending that Article 311 of the Constitution be amended.	
33	We do not see any reason why the Penalties not provided for in Article 311 of the Constitution should be so treated in the Railway Servants Discipline and Appeal Rules. We would urge the Railway Board to take immediate action so that for the imposition of penalties other than those provided for in the Constitution, a summary and simplified procedure is adopted.	The Ministries of Home Affairs and Law have opined that even for imposition of the penalty of reduction to a lower stage in the time scale of pay, requirement of Article 311(2) must be fulfilled. In other words, it is not possible to follow summary procedure for imposition of the penalty of reduction to a lower stage in the time scale as even in such cases detailed procedure as laid down in the Railway Servants (Discipline and will have 10 Appeal) Rules be followed. The decision that in cases where increments are withheld for a period of more than three years or where increments are stopped with cumulative effect or where such stoppage is likely to affect adversely the pensionary benefits, the procedure for holding full departmental enquiry as in case of major penalties,

		should invariably be follow- ed, has been taken by the Ministry of Home Affairs at the meeting of the National Council held in November 1967. Consequent on this decision, the Ministry of Home Affairs revised their rules and the Ministry of Railways also followed suit. Any unilateral action on the part of the Ministry of Railways to deliberalise the Railways Servants (Discipline & Appeal) Rules is likely to be opposed by organized labour. In view of this, it is not possible to accept the recommendation made by the Wanchoo Committee in this regard.
34	(See Chapter IV, Para 75).	
35	It occurs to us that the disciplinary inquiry can, with advantage, be conducted by special inquiry officers trained and deputed exclusively for this purpose. These officers should form a part of the Personnel Branch and should be chosen with great care so that	The question of increasing the number of whole-time Enquiry Officers was re viewed in July 1978 and it was felt that it was not justified for the present. The existing Enquiry Officers (one on each Railway) at present function under the

	they have a good knowledge of the Discipline and Appeal Rules and where possible also some knowledge of law as well as legal procedures.	administrative control of Senior Deputy General Manager.
36	**(i)** to **(iv)** (See Chapter IV, Para 79).	
37	**(i)** It must be appreciated that reservation of posts in favour of a community er a group of people must not be at the cost of overall efficiency of the administration, **(ii)** At the stage of initial recruitment there is no objection to reservation of quotas for scheduled castes and scheduled Tribes. At the promotion stage, however, such reservation can give rise to a feeling of inequity among the staff who have already put in several years of service. **(iii)** We consider that the Government should now review the question of reservation of quotas for, and the weightage given to, scheduled castes and scheduled tribes at the promotion stage in the context of the present-day conditions.	**(Items 37 (1) to (iii).** It has not been found possible to reduce in any way the reservations and quotas for the Scheduled Castes and Scheduled Tribes.

38	We recognize that if a vast organization like the Railways is to function efficiently, it must have in its superior cadres' men of the best caliber available. Obviously, the objective is unlikely to be achieved unless service conditions are such as to attract talented young persons.	The pay scales and service conditions of Railway Officers are more or less the same as those of other Central Ser vices; the pay scales and promotion prospects of LAS / TFS are far better. The Indian Railways undoubtedly at tract talented young persons. For in-stance, in the Engineering Services almost all the top ranking candidates opt for and are inducted into the Railway Services as seen from the statement given below:-

	IRSE		**IRSME**		**IRSSE**		**IRSEE**	
Year of examination	**No. of candidates recruited**	**Ranks of the candidates**	**No. of candidates recruited**	**Ranks of the candidates**	**No. of candidates recruited**	**Ranks of the candidates**	**No. of candidates recruited**	**Ranks of the candidates**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1972	10	1 to 10	8	1 to 10	5	4 to 13	3	4 to 7
1973	10	1 to 10	15	4 to 22	6	2 to 11	10	6 to 18
1974	16	1 to 14£	15	1 to 21	6	1 to 17	15	1 to 20
1975	16	1 to 14£	23	2 to 24	6	3 to 7	19	1 to 27
1976	16	1 to 14£	10	1 to 6	6	4 to 10	20	1 to 27

£Scheduled caste candidates have not been included.

		There is, however, a tendency on the part of the officers recruited to the IRAS and IRTS to join the IAS/IFS subsequently. With a view to improving the efficiency and effectiveness of Railway Services, cadre review is made every three years and, in these reviews, promotion prospects are also taken into consideration.
39	**(i)** We realize that it is not our function to spell out the details of the proposals for improving the pay scales and prospects of officers, but we are anxious that the general feeling of discontent should be cleared up and the cadre structure of railway officers should be so recast that from the point of view of prospects, the best talent is attracted to the Railway services. **(ii)** We understand that the Administrative Reforms Commission went into this matter in considerable detail and have made certain recommendations. We have no doubt that the	**(Items 39 (i) & (ii)).** According to the recommendations of the Administrative Reforms Commission as accepted by the Government, the cadres of different group 'A' (Class I Services) are required to be reviewed every three years. The first review of the cadres of Railway Services was done in 1973. The restructuring in- volved 250 Junior Scale posts being placed in Senior Scale, 500 Senior Scale posts in Junior Administrative grade and 218 Junior Administrative grade posts to Inter-

	Government will consider these recommendations closely, appreciating the need for urgent action. We would, on our part, urge them to devote their attention to this problem without loss of time.	Administrative and Senior Administrative grades. These proposals were implemented in 1974-75. This pro-vided, though partially the much-needed organizational relief, at Head- quarters and Divisional levels on the Railways. It also helped, though not to the extent needed, in improving the promotion prospects of Railway Officers. The second cadre review proposals are being formulated in consultation with the Department of Personnel and Administrative Reforms. The cadre Review Committee consisting of the Cabinet Secretary, Personnel Secretary, Department of Expenditure, Chair- man, Railway Board and Financial Commissioner for Railways would take up the review of the Railway cadres as soon as the initial scrutiny by the Department of Personnel is completed.
40	(See Chapter IV, Para 85)	

41	The present set-up on the Railways has no doubt stood the test of time but in the present situation with the increasing tempo of traffic, increase in manpower and complexity of management problems, a time has come when serious thought should be given to streamline the command structure on the Railways to deal with the challenges of the present and the future. One way in which this may be accomplished is for the organizational structure to be subjected to an expert study.	The Report of the Administrative Reforms Commission on Railways has since been considered by the Government an decisions on various recommendations contained therein have been finalised with the exception of recommendations Nos. 18 (2&3) regarding promotional policy. No. 23 regarding procedures for disciplinary action and setting up Civil Services Tribunals and No. 38 (1) and (2) regarding enlargement of powers of Railway Protection Force.
42	We refer to the various reasons adduced for increase in unproductive paperwork. We are aware that this state of affairs is not peculiar to the Railways and also that the reasons are hardly likely to lend themselves to an easy solution. But we consider that consultancy in the matter of office procedures as also in other fields may open up the management to fresh and useful ideas.	The recommendations of the consultancy services were not very useful to the Indian Railways. Many of the suggestions were not practicable. Such consultancies were not, therefore, tried further.

43	We suggest that the Railway Board and the Railway administration should investigate whether any further devolution of authority and delegation of powers would not be conducive to a reduction in the volume of correspondence and paperwork. We would, however, strike a note of caution that any delegation of powers can have utility only if the authority to whom the power is delegated is allowed to exercise the power and obviously it will be rendered in-effective if distrust in the man on the spot continues to prevail.	Delegation of powers to lower levels is kept under continued review and the powers are liberalized as and when warranted. The powers of the General Managers were enhanced in June 1974 and again in December 1977 on the basis of the recommendations of the committee's set-up for the purpose. The General Managers have also been authorized to redelegate their powers to the Divisional Superintendents to the extent necessary after taking into account local conditions.
44	**(i)** to **(v)** (See Chapter IV, Para 94 and 101)	
CHAPTER III- TRAINING OF STAFF		
45	We found the arrangements for general purpose training of staff generally adequate except for a few isolated instances of shortcomings in the facilities for training like inadequacy of hostel accommodation at the Zonal Training Schools at Alipurduar and Tiruchirapalli, and non-supply of accident	The training capacity available in the training school is utilized to the maximum extent and the hostel accommodation is adequate. The Commissioner of Railway Safety has been asked vide Railway Board's letter No. 69/Safety (A&R)/Report dated

	enquiry reports of the Additional Commissioners of Railway Safety to Zonal Training Schools. It was also indicated to us that there was ample scope for intensifying the training of drivers, train examiners, trade apprentices etc. at Jamalpur.	14-1-1970 to advise the ACRS's to send cyclostyled copies of the final reports of accident enquiries to the Railways to enable them to distribute these copies to the Zonal/Area Training Schools.
46	We were struck by the absence of a Zonel Training School on the South-Central Railway. We con- sider it essential that the setting up of a Zonal Training School and the creation of training facilities on the South-Central Railway is not delayed further.	Zonal Training School has been established at Maula Ali which is functioning.
47	We consider that with the introduction of modern highly sophisticated equipment in various fields of railway operation, it has become imperative that the staff entrusted with the responsibility of handling, operation and maintenance of the equipment are imparted adequate and intensive training.	This is already the policy and there is no change.
48&49	(See Chapter IV, Para 113).	
50	(See Chapter IV, Para 117).	

51&52	(See Chapter IV, Para 120).	
53	It is suggested that mechanical and electrical cadre of signalling staff should be combined and integrated into a single cadre. This step would, in our view, result in closer inspection and better maintenance of signalling equipment.	A committee was appointed for review of rules regarding recruitment, training. syllabus etc. for inspectors and artisan staff of the Signal and Telecommunication department of the Indian Railways. This Committee after examining all pros and cons came to the conclusion that the nature, skills, required for the two categories is different and hence the combination of these two categories will not be feasible. This recommendation of the Committee has been examined by the Railway Beard that it is not possible to combine the cadres of Signal Maintainers.
54	**(i)** and **(ii).** (See Chapter IV, Para 124).	
55	We suggest that the Railways should create adequate facilities in their System Technical Schools or alternatively in schools attached to the diesel locomotive sheds for imparting proper training to the staff employed on the	Necessary facilities have been created on all the Railways except North-Eastern and South Central Railways. The North-Eastern Railway have no diesel locomotives. South Central Railway's

	maintenance of diesel locomotives.	staff are trained on the South-Eastern Railway.
56	**(i)** to **(iv).** (See Chapter IV, Para 129).	
57	We suggest that the Railways This recommendation is kept in view should keep a special watch on the nature of lapses on the part of the diesel and electric locomotive drivers which result in accidents as these may be useful pointers to the shortcomings in their training.	
58	(See Chapter IV, Para 94).	
59&60	(See Chapter IV, Para 141).	
61	**(i)** We agree that scientific approach should be inculcated in staff dealing with long-welded rails through Initial training and frequent refresher course. This, in our view, should also held true in case of staff deputed for maintenance of track by measured shovel packing. **(ii)** We suggest that necessary facilities should be built up on each Railway and, as a first step, instructors for these jobs should be	**Items 61 (i) and (ii)** This is already being done.

	trained by the RDSO or at a suitable centralized training center.	
62	We feel that the setting up of a school for the training of staff in the use of ultrasonic flaw detectors should receive high priority.	Arrangements made at RDSO still continue.
63	**(i)** We feel that necessary facilities for imparting training in scientific methods of materials management will have to be created on the Railways or in a centralized institution. **(ii)** We suggest that the possibility of making use of the Indian Rail ways School of Electrical and Mechanical Engineering, Jamalpur or other similar institutions or developing alternative facilities for training of stores personnel be examined.	**Items 63 (i) and (ii)** The staff of the Stores Department are now given initial and refresher training which includes materials management in the Zonal Training Schools and Technical Training Schools of Production Units as per standard syllabus prescribed for the purpose.
64	We consider it essential that that training in service should be in- tensive; regular and should be more job-oriented than theoretical as is the case at present.	Periodicity of refresher training in respect of various categories of staff has been laid down in the standard syllabus of training. The periodicity is 3 to 5 years.
65	We emphasize the need for the proper	The Railways were advised, reiterating

	training of inspectors and other supervisors since ultimately the interpretation of what the administration requires its workers to do rests in the hands of these men who are in direct contact with the workers. On the quality of these men depends not only the image of the administration in the eyes of the workers but also the quality of output which would ultimately emerge.	earlier instructions that supervisor's course should be arranged in all training schools and that some selected supervisors should be sent to the Zonal Training School, Northern Railway, Chandausi for a special higher course in management vide Railway Board's letter No. E(Trg) I-69 TRI/110 dated 23-4-1970. The Railways were also asked to take special steps for teaching management and supervision to Supervisory staff in a more purposeful manner vide Railway Board's letter No. E (Trg)/69/TRI/110 dated 25-2-1971. The training arrangements made by the Railways were reviewed in 1972 and these were considered adequate.
66	66. It is of vital importance that specialized courses are arranged for inspectors and supervisors both to develop their outlook and to make them professionally more competent. Indeed, this matter is 50	**Items 66 and 67** Instructions vide Railway Board's letter No. E(Trg) I-69 TRI / 110 dated 23-4-1970 have since been issued to Railway Administrations to arrange management

	important in our view that it should receive the attention of, and may be watched by, the General Managers themselves. We have no doubt that those who undergo such specialized courses would emerge as better inspectors and better supervisors.	courses regularly and particularly to the Northern Railway to make adequate arrangements at the Chandausi School for the training of supervisory personnel and also to organize the 'Management and Supervision' Courses for selected supervisors from all the Railways on a programmed basis, at least twice a year. The Rail- ways have advised that adequate arrangements for training of supervisory personnel on the subject 'Supervision and Management' have been made by the Railway Administrations. They have also advised that existing arrangements of training (viz., training at the Zonal Training School in addition to the special higher courses on 'Supervision and Management' organized by the Chandausi School) are adequate which should continue.
67	We understand that arrangements were made	

	for conducting a centralized course in supervision and management in the Zonal Training School at Chandausi, Judging from the fact that in the last four or five years only four courses were held, it is doubtful if the matter is receiving the attention which it deserves. We are also doubtful if the facilities and the caliber of instructors at Chandaust are such as to make it possible to orient the course with an all-India outlook.	
68	We suggest that refresher training of senior supervisors belonging to civil engineering, transportation and mechanical engineering departments should, like those of the signal engineering department, be arranged at the respective all- India training centers at Poona, Baroda and Jamalpur. Specialized courses of three to four weeks duration organized at regular intervals should make it possible for all inspectors and supervisors to be trained and adequately within a short span of time. If the existing facilities at these	Initial views: Refresher courses for inspectors are already being run on the Railways and the emphasis is on the specific peculiarities and problem of their respective Railways. This is considered more beneficial as inspectors are normally not transferred outside their Railways. Final views; Recommendation not accepted.

	institutions are inadequate, it would be well to augment them suitably.	
69	The following suggestions were put forward in evidence which merit consideration: - **(i)** An experienced officer should be specially selected and put in charge of the probationary officers when they come on the open line to pick up the actual work, they have to do so that they are not left to their own resources to pick up what they can. There should be a whole-time training officer deputed for the purpose. We understand that a scheme has been started for probationary transportation officers at Asansol where young trainee officers received field training under the guidance of an experienced whole time officer. We welcome this step and urge that similar steps should be taken for trainee officers of other departments.	The question of imparting training under a whole-time officer-in-charge in respect of Indian Railway Traffic Service probationers was reviewed and the Railway Board in their meeting held on 22-7-72 decided that the centralized training for Indian Railway Traffic Service probationers should be discontinued and that the probationers should receive training on the respective Railways to which they are allotted. Accordingly, Indian Railway Traffic Service probationers' of 1971 batch on-wards are receiving training on their allotted Railways. Railway Board's letter No. 72E(GR) II/4/5 dated 26-8- 1972 refers. The system of imparting training to probationers of all the services under a whole time officer-in-charge or other-

		wise was again considered in 1977 and the Railway Board decided that the existing system of training on the Railways should continue.
	(ii) Senior seasoned officers should be deputed to go as roving instructors. They should spend some time with the officers, even up to the Divisional Superintendent's level and guide them in their problems as friends rather than as critics.	Deputing senior officers especially for this purpose is not considered necessary as Heads of Departments and other senior officers are already doing this in the course of their normal tours.
	(iii) The officers and supervisors of technical departments should be so trained as to receive specialized training in particular trades while acquiring broad knowledge of railway working in other fields.	This is already the practice in respect of training of officers of various departments. In respect of training of supervisors, the remarks offered against items 65 to 68 will apply.
70	We consider that a young officer is an asset on whom no investment is too heavy to make him professionally competent and a good manager of men.	Noted.
CHAPTER IV. OTHER STAFF MATTERS.		
71	**(i)** We are of the view that the conditions	**Items 71 (i) to (iv)**

	which brought about the setting up of the Railway Service Commissions do not exist any longer.	The government after careful consideration have decided that the system of recruitment of Class III staff through Railway Service Commission should continue. But as far as possible there should be a separate Railway Service Commission for each Zonal Railway. Separate Railway Service Commissions have started functioning for North-Eastern and South-Central Railways. Orders have also been issued to open an office of Railway Service Commission for Northeast Frontier Railway at Gauhati.
	(ii) We suggest that recruitment of staff in all mass categories and semi-mass categories should be left to the Railway Administration and the recruitment should be decentralized to be made at the divisional level.	
	(iii) We consider that it will be adequate if a Committee of two officers is appointed by the Divisional Superintendent to make the	

	recruitment of staff in various categories at suit- able intervals.	
	(iv) We further suggest that categories of staff other than mass categories and those for which either the minimum qualification is a university degree or a technical degree or diploma or which are otherwise specialized as for example, nurse. school teachers, printing press staff, etc., may continue to be recruite through Railway Service Commissions.	
72	**(i)** We consider that fer staff engaged in the operation and maintenance of diesel and electric locomotives, modern signalling equipment tie tamping ma- chines. complicated hydro-electric and electrical equipment in the workshops etc., a good basic education and certain minimum technical qualifications are essential so that the staff who are entrusted with the responsibility of operation and maintenance of modern equipment are not raw and	Items 72 (1) and (ii) Accepted in principle. The qualifications considered necessary for Signal and Telecommunication staff have been worked cut and will be implemented as far as possible in consultation with organized labour. So far as Mechanical and Electrical Departments are concerned, it has since been decided to recruit Ap- prentice Mechanics with Diploma as qualification. They are

	uninitiated hands but have an intelligent and effective grasp of the equipment they handle.	thereafter appointed as Chargemen after training for 3 years. In the Civil Engineering Department, direct recruitment to the categories of Assistant Permanent Way Inspector is only from among holders of diploma in Civil Engineering who are given training for 18 months. This has beer reduced to one year.
	(ii) We suggest to the Railway Board and Railway Administrations to evolve the minimum basic qualifications for each of these categories. We have no doubt that in the present conditions, there would be no dearth of men having the requisite qualifications.	
73	(i) to (v) (See Chapter IV, Para160).	
74	(See Chapter IV, Para 163).	
75	(i) and (ii) (See Chapter IV, Para 170).	
76	(See Chapter IV, Para 175).	
77	It was observed by the National Federation of Indian Railwaymen that under the hours	In accordance with Section 71 (C) (2) of Indian Railways Act, 1890 and the rules

	of employ ment regulations, a continuous worker was required to perform 8 hours duty a day, but for payment of overtime the basis of 54 hours a week and 231 hours in a month was adopted. We think that trade unions would already have brought up this matter before the Railway. Administration and the Railway Board. We, therefore, leave it to the Railway Board to examine the contention of the Federation.	framed thereunder, a 'Continuous' worker is required to work for 54 hours per week on an average in a month and he becomes entitled to overtime if he works more than 231 hours in a month. However, this practice of paying overtime beyond the monthly limit of 231 hours for staff classified as Continuous' has been liberalized as such staff are now paid overtime on fort-nightly basis beyond 108 hrs. on and from 14-8-1963. The National Federation of Indian Railwaymen had raised this issue be fore the Railway Labour Tribunal 1969. who, after taking into account the sub-missions both by the Railway Board and the Federation, held that the principle of averaging is warranted in railway working in regard to (i) running staff (ii) operating staff (iii) shift workers, and (iv) those workers whose work is bound

		up with the work of workers comprised in the above three categories. As regards those workers who are not covered by the above categories of staff, overtime is admissible on daily basis. The said Tribunal has also recommended payment of overtime at i times of the ordinary rate of pay beyond the rostered hours and up to statutory limit and at twice the ordinary rate beyond the statutory limits. In the case of running staff and other travelling staff. based on the recommendation of the Tribunal, overtime is payable beyond 104 hours and up to 108 hours at 11 times of the ordinary rate and at twice the ordinary rate beyond 108 hours on a fortnightly basis. The recommendation made by the Railway Labour Tribunal, -1969 relating to the Hours of Employment Regulations

		were accepted by the Government and orders were issued to the Railways for their implementation with effect from 1-8-1974. As a result of implementation of these recommendations of the Tribunal, and increase in the scales of pay and allowances of Railway servants, the expenditure on overtime payment has increased considerably.
77	**(a) (i)** We are unable to see the merit of the argument under which the assistant station master at stations manned by the one station master and one assistant station master is continually on night duty for months and sometimes years. We urge the Railway administrations to go into this matter closely and find a satisfactory solution.	**Items 77 (a) (i) to (iii)** Orders were issued to the Railways vide Railway Board's letter No. E(LWA) /69 HER / 48 dated 6-7-1970 that at stations where there is one Station Master and one Assistant Station Master, the duty rosters should be revised in such a manner that out of a cycle of four weeks the Station Master at each such station is placed on day duty for a period of three weeks while for one week the Assistant Station Master is given day duty and the Station Master rostered for night shift

		duty. Progress reports subsequently received from the Railways intimating implementation of the Railway Board's orders revealed that on the Western Railway, at stations where there was one Station Master and one Assistant Station Master, they were rostered to rotate each week so that the ASM was not on continual night duty. The Central and Eastern Railways reported compliance of these orders. The South Central and Northeast Frontier Railways also reported compliance except on the Vijayawada Division of the South Central Railway and a few stations on the Alipurduar Division of the Northeast Frontier Railway where also action was in hand to implement the said orders. The North-Eastern Railway also initiated action and in most of the cases the revised rosters had already been implemented. In a few cases, however,

		where transfer of staff was also involved, it was felt by the Railway that it would cause hard ship to the staff in view of the school session. It had, therefore, been decided to stagger the implementation at such stations in a manner as would cause least inconvenience to the staff, However, the Southern, Northern and South-Eastern Railways had reported difficulties in implementing the Railway Board's orders. However, it was felt that it would take a year or a little more to switch over to the arrangement on the remaining three Railways. The precise position is being ascertained from all the Railways.
77	**(ii)** In the absence of any other alternative, we are of the view that it may be possible to re-roster the duty shifts of the assistant station master and the station master so that the shifts change at midnight and 12 hrs. noon, the assistant station master coming on	

	duty at midnight.	
	(iii) On sections where traffic is very light and where there are such stations the Railway Administrations may also examine the possibility of scheduling the trains in a manner that the station is closed during the period say from 22.00 to 04.00 hours so that the assistant station master is not on duty right through the night as a permanent measures.	
78	**(i)** and **(ii)** (See Chapter IV, Para 180).	
79	**(i)** We emphasize that when a decision is taken to provide uniforms to certain categories of staff non-supply or irregular supply of uniforms thereafter is a source of needless discontent and frustration in the staff.	**Items 79(1) and (ii).** Consequent to the M.R's budget speech on Railway Budget for 1977-78 and General Managers Conference held in December, 1977. certain guidelines for streamlining the fabrication and supply of uniforms to railway staff have been issued, which inter alia provide for reviewing the standard sizes in consultation with experts; for appointing tailors on casual labour rates for taking
	(ii) There were several complaints to the effect that the uniforms sup- plied were ill-fitting. An ill-fitting uniform is a stigma on	

	the management. We have a feeling that not much thought is given to this matter. We do not see why the railway or its suppliers, should not find it possible to supply to each employee a uniform which fits him more less to size.	individual measurement to sizes and supervising the work regarding indenting, fabrication, stitching and distribution of uniforms as well as attending all sorts of complaints and arranging rectification etc.
	(iii) We are also of the view that categories of staff whose work is entirely outdoor may be provided with rain coats. Overcoats may also be provided to staff in the categories of shunting jamadars and gangmen where the need for providing these seems justified.	The Chairman, Uniforms Committee, 1969, was advised (reference letter No. E(W)69UNI-33 dated 22-10-1969) that this recommendation of the Wanchoo Committee may be kept in view while finalizing the report of the Uniforms Committee. In para 8.6 of their Report, the Uniforms Committee gave their conclusions as under: "These recommendations taken into consideration. have been In regard to the supply of waterproof clothing to staff working out-door in rain, all categories of such staff have been made eligible,

		for supply in areas of heavy rainfall. Overcoats have been provided for shunting jamadars working in 'very cold' areas. For gangmen, only jerseys have been prescribed as they cannot work with overcoats". On the basis of the observations/recommendations made in the Report of the Uniforms Committee-1969, 'Revised Dress Regulations' have been prescribed in 1978 with the approval of the Minister for adoption on the Railways. Under these regulations protective clothing for protection against monsoon have been provided at 'heavy rainfall' places, i.e. where there is an annual rainfall of 40 inches or an equivalent of 1000 millimeters. Even in areas which do not qualify as a heavy rain- fall area, a certain number of water-proof clothing is kept in Tools and Plant

		account with the supervisory official for use on occasions of incessant rain lasting for short periods only, with ha view to ensure smooth working at large stations and also for emergent use by the staff who are not individually eligible but who may require them on such occasions. The present Regulations are considered adequate to cover the actual requirements of also the staff whose work is entirely outdoor. Supply of overcoat is prescribed for shunting jamadars working in 'very cold areas. For gangmen, as observed by the Uniforms Committee-1969, the nature of their work is such that they cannot work with the overcoat on, and supply of overcoats to them is not prescribed. Due to shortage of funds, liberalization of the existing Dress Regulations to all staff working outdoor or to all shunting

		jamadars irrespective of the climatic conditions of the place of their work has not been considered feasible.
Chapter V-RULES, RULE BOOKS AND MANUALS		
80	**(i)** We would welcome a revised set of rules which provide for the technological changes that have taken place in recent years and suit the requirements of the growing system and from which all the outdated rules have been weeded out.	**Items 80(i), (ii), (ii)** The General Rules, at present in force on the Railways, were adopted in 1929. The considerable advance made in re cent years in methods of signalling and interlocking, modes of traction and introduction of new types of equipment necessitated a revision of these General Rules, The need was recognized by the Kunzru Committee and the Wanchoo Committee, which desired that the revision of Rules should be consistent with the conditions obtaining at present and likely to obtain in the foreseeable future. The Wanchoo Committee also emphasized the need for keeping the basic complexion of rules intact while providing for technological
	(ii) We recognize that with the weeding cut of superfluous and redundant rules and cutting out of deadwood, renumbering of rules would be inescapable to maintain continuity. If, however some way can be found to retain the old numbers for at least the more important rules like those pertaining to giving permission to approach, taking off of signals etc., it would certainly impose a much lighter burden on the staff than if they are faced with a set of rules in which there is no shred of similarity.	

		developments in recent years. A Committee comprising of officers from the Traffic and Signal departments was appointed by the Railway Board in 1968. A set of draft rules was submitted for consideration of the Railway Board in February 1970. The Commission of Railway Safety whose comments had been invited, did not agree to the adoption of the draft rules on the grounds that they had proposed the abolition of certain fundamental concepts such as classification of stations, minimum equipment of signals for each class of station, etc. In consequence, it was decided by the Railway Board in September 1972 that the revision in the existing General Rules should cover such aspects only as require modification in the light of the technological changes or where certain
	(iii) We realize that the work of revision of rules has already gone sufficiently ahead. We, therefore, leave it to the Railway Board to see to what extent the general arrangement of this basic vocabulary of staff concerned with train running can be retained.	

		existing rules have become outdated. A fresh revision of the General Rules was accordingly undertaken by the Safety Directorate and a revised draft of General Rules was made in 1974. After taking into account the views and comments received from the Rail- way Administrations, the RDSO, the Commission of Railway Safety and various other Institutions, revised General Rules were sanctioned and issued in February 1976. The numbering of these rules has been done according to modern practice, and the arrangement of chapters and Rules have been rationalized. Hindi translation of these rules is presently in the process of being vetted by the Official Language Wing in the Ministry of Law, Justice and Company

		Affairs. Meanwhile, the Railways are preparing Subsidiary Rules in conformity with the revised General Rules. It is pertinent to mention that many of the working practices have been standardized for adoption on the Railways, such as working of trains during total failure of communications, issue of caution orders, berthing of passenger trains, rules for fog signalling, etc. and standardization is a continuing process.
81	**(i)** In our view, the justifications for publication of the statutory rules and codes in bilingual form exists only when they are required for reference but when a rule book is required to form the personal equipment of the staff, insistence on its being bilingual is ill-conceived.	The Railways were advised that this recommendation should be noted carefully for compliance in future.
	(ii) We suggest that Rule Books intended to be for the personal use of staff should be printed in English, Hindi or in the regional	The Railways were advised that this recommendation should be noted carefully for compliance in future.

	language as separate editions and the staff may be supplied these books according to their requirements.	
82	**(i)** We recommend that arrangements may be made for the compilation of unified manuals on mechanical engineering and electrical engineering applicable to all the Railways.	**Items 82(i) and (11)** Four committees were set up by the Railway Beard for preparation of Uni-fled Maintenance Manuals for (1) Steam locos (ii) Diesel locos (iii) Coaches and (iv) Wagons. Steam and Diesel Loco Manuals submitted by the respective Committees have been approved by the Railway Board and those for coaches and wagon stock are in an advance stage of finalization. The Steam loco Manual and the Diesel loco Manual have been handed over to the Department of Printing for printing by the Government of India Press. A Standard Manual for Electric traction has been framed.
	(ii) We consider it necessary that efforts are made to see that there is as wide a ground of agreement among the Railways as possible in regard to the practices and procedures proposed to be unified and incorporated into the manuals.	
83	83. **(i)** We have seen the handbooks brought out by the Railway Board in recent years for	This is an observation and hence no action is called for.

	different categories of staff, viz., station masters, assistant station masters, guards. switchmen and cabinmen, levermen and pointsmen, gatemen, yard staff and permanent way staff. These handbooks appear to us useful and interesting.	
83	83 **(ii)** We recommend that similar handbooks should be brought out for the use of drivers, train examiners, route relay interlocking maintainers and panel operators. centralized traffic control maintainers and panel operators, start concerned with maintenance and operation of diesel and electric locomotives, train lighting staff, etc.	The draft handbooks for drivers/motor-men/firemen, TXR and C & W filters and signal maintainers decided to be prepared in pursuance of the recommendation of the Wanchoo Committee have already been finalised. The Railway Administrations are being consulted on these drafts before Hand Books are finally printed and brought out which will take some time.
CHAPTER VI-PERMANENT WAY		
84	(See Chapter IV, Para 216)	
85	(See Chapter IV, Para 221)	
86&87	(See Chapter IV, Para 229)	
88	During the course of inspections carried out on short lengths of track on some of the	The observation of the Wanchoo Committee together with Railway

	Railways, we found that:- **(i)** Often sleepers were out of square, keys of steel-trough sleepers were driven rather in-discriminately, sleeper spacings were not according to drawings, some rail joints had nearly run on to joint sleepers due to creep, and correct templates had not been used. the spiking being anything but trapezoidal;	Board's views thereon were communicated to all Zonal Railways for taking necessary action. The Railways were further advised vide Railway Board's letter No. 70/W6/RAIC/11 dated 24-2-1971 to draw the attention of officers/subordinates at different levels responsible for maintenance and inspection, to the detailed instructions laid down in Para 1628 of the Code for the Civil Engineering Department and Paras 206, 601, 644 and 647 of the Indian Railway Way and Works Manual in regard to maintenance and inspection of track. All the Railway Administration are alive to the need for proper maintenance of track to the standards.
88	**(ii)** (See Chapter IV, Para 235)	
88	**(iii)** (See Chapter IV, Para 238)	
89	Even though these observations are limited in character, it is evident that a lot needs to be done to improve the general standard of	**Items 89 and 90** Improvement in the standard of maintenance of track is receiving

	maintenance of track.	constant attention of the Railway Board. Improved methods of maintenance such as mechanized maintenance, measured shovel packing and directed track maintenance are being introduced on gradually increasing lengths of track to improve the standards of maintenance specially on heavy traffic density and high-speed routes. The schedule and sequence of maintenance operations. have also been laid down.
90	It is necessary that the staff entrusted with the maintenance of track are enjoined to adhere to the instructions laid down if the state of the track is to im- prove. We also consider that conditions have to be created to cope with the present and future trends of heavier train loads and heavier rolling stock running at higher speeds.	
91	In our view, the programme of track maintenance round the year should aim at the following:-	

	(i) The sequence of track maintenance operations should be arranged according to the climatic periods so as to obtain the best results;	The existing practice is in conformity with the recommendation. No further instructions were, therefore, required to be issued and the recommendation was treated as closed.
	(ii) A reasonable turnover per unit labour for each specific track maintenance operation should be ensured. Scientific work studies of the various operations would, in our opinion, yield useful results.	Time studies have already been conducted or some track maintenance operations and these yield- ed useful information which 15 being made use of by a Committee recently appointed for evolving a suitable formula for gang strength. It is felt that evolution of such a formula would be more useful than fixing a turnover per unit labour for each specific track maintenance operation,. more so in the context of new innovations recently introduced in manual track maintenance and measured shovel packing. This recommendation was therefore, treated implemented and closed.

92	92. We suggest that the mechanics of 'renaissance' in track maintenance as enumerated by the South-Eastern Railway be tried over some sections in order to get a correct appraisal of its value and the results placed before the Track Standards Committee.	The recommendation of the Wanchoo Committee was examined by the Track Standards Committee in their 47th meeting held in May 1971. The Track Standards Committee observed that as the technique adopted by the South-Eastern Railway had not been tried on any other Railway, at least two Rail-ways, viz., Eastern and North-Eastern should try the technique. The recommendation of the Track Standards Committee was accepted by the Railway Board and trials were carried out on the Northern and North-Eastern Railways. The results of the trials conducted by these two Railways were examined by the RDSO who felt that the self-appraisal technique adopted by the South-Eastern Railway was not very much relevant to the modern methods of track maintenance which consisted of a constant review and appraisal of the

		track condition in a more objective and quantitative manner through track recording cars and measurement of vertical and lateral accelerations through oscillograph car runs. The Railway Board accepted the views of the RDSO and no further action was taken on this recommendation of the Wanchoo Committee.
93	**(i)** to **(iii)** (See Chapter IV. Para 242)	
94	(See Chapter IV, Para 244)	
95	(See Chapter IV, Para 259)	
96&97	(See Chapter IV, Para 261.	
98&99	98. **(i)** to **(v)** & 99. (See Chapter: IV, Para 266).	
100,101 &102	(See Chapter IV, Para 269)	
103	General Rule 90 prescribes a speed restriction of 15 kmph on turn outs. The rule as it stands, makes no distinction between the various gauges nor does it make any	On the basis of the speed trials conducted by the RDSO on turn-cuts of improved design, the following maximum permissible speeds higher than 13

<table>
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<td>reference to the angle of crossing, the track structure or the type of locomotive. These are matters which require considerate study and research to ascertain the stage at which dangerous conditions are liable to occur and to lay down limits of safe speed. We consider that General Rule 90 should be more specific and should be revised in the light of such study and research.</td>
<td>kmph have been permitted by the Railway Board.
<table>
<tr><th></th><th>Turn-outs</th><th>Maximum permissible speed in kmph</th></tr>
<tr><td>1</td><td>1 in 16 turn out</td><td>50</td></tr>
<tr><td>2</td><td>1 in 16 high speed turn-out to drawing No RDSO/T-403</td><td>60</td></tr>
<tr><td>3</td><td>1 in 16 symetrical split to drawing No. 20178</td><td>75</td></tr>
<tr><td>4</td><td>1 to 20 turn-out to drawing No RDSO/T-98</td><td>50</td></tr>
<tr><td>5</td><td>1 in $8\frac{1}{2}$ BG turn-out with curved switches.</td><td>25</td></tr>
<tr><td>6</td><td>1 in 12 BG turn-out with curved switches</td><td>40</td></tr>
</table>
The maximum permissible speed of 15 kmph is still applicable to turnouts of conventional design.</td>
</tr>
<tr>
<td>104</td>
<td>We consider that small and in- expensive devices like a magnifying glass as well as a mirror can be provided for the use of gangs for detecting flaws in rails wherever rail</td>
<td>Magnifying glasses and mirrors have been supplied to the permanent way gangs for detecting flaws in rails by visual inspection, on sections where rail</td>
</tr>
</table>

	failures are frequent.	failures are frequent.
105	(See Chapter IV, Para 273)	
106	We suggest that from now on research and development of a self-propelled ultrasonic rail inspection car should be taken in hand so that before long each zonal railway has one for use on its system.	RDSO is seized with the subject of developing an ultrasonic rail flaw detecting car. Action will be taken to procure as soon as some definite plan is formulated.
107	We suggest that each case of rail failure as it occurs should receive close attention of the ad- ministration by way of chemical analysis, investigation of the previous history of failures of rails of the same type and age and other cognate factors.	This is already the practice. No action was called for.
108	We note the decision of the Rail- way Board to extend the method of measured shovel packing in the light of experience gained but would like to point out that if a section of the track is subjected to mechanized maintenance in the first instance, its subsequent maintenance by measured shovel packing is more satisfactory and lasts longer. We would like the Rail- way Board to bear	Measured shovel packing is being carried out after a stable ballast bed has been obtained by repeated manual packing or by mechanical packing. This recommendation was, therefore, treated as implemented and closed.

	this in mint while planning for extending the use of measured shovel packing	
109	In regard to the general adoption of directed track maintenance, we consider that:-	
	(i) It is an essential prerequisite of directed track maintenance that suitable means of transport should be available to convey gangmen and their equipment to and from the site of work;	Directed track maintenance has so far been adopted where the gang length does not exceed normally 7 to 8 kilo meters. For this much gang beat, cycle as a means of transport for gangmen is considered enough. Directed track maintenance is not being adopted where the gang beat is more than this length.
109	**(ii)** the benefits from concentration of effort over a selected length of a few miles of track which directed track maintenance in- volves has to be carefully weighted against the disadvantage due to the withdrawing of gangmen and their supervisors on many other sections of the track to form a part of the scheme and the resultant longer intervals between inspections and slackening of super-vision; and	Directed track maintenance does not involve the withdrawing of gangmen and supervisors from other sections of the track. It also does not result in longer intervals between inspection and thereby slackening of supervision.

	(iii) in respect of optimum gang length, a four-mile length of single line has, for some years, been a limit; conditions today, if anything indicate the necessity for shorter rather than longer lengths, for inspection and supervision to be effective.	Four miles length of single line has been more or less a limit in the past, What is required is more and better inspection as well as attention to the track. This can be achieved not necessarily by reducing the gang length Directed track maintenance aims at achieving the objectives by having need based inspection/attention and thereby taking out the time that was spent earlier in inspecting/attending such lengths of track as did not need it and utilizing the time/effort so saved on sections which require it.
110	**(i)** to **(iii)** (See Chapter IV. Para 281).	
110	**(iv)** Clean stone ballast for all adequate depth below the sleeper is a prerequisite for the working of an automotive tie tamper. This condition obtains on some sections of the trunk routes but, by and large on the main and branch lines the mixture of 'muck' with stone ballast is considerable. We feel that it will take some time before all sections	Adequate stone ballast depth below the sleeper is necessary for the working of He-tampers. Wherever tie-lampers are introduced, screening as well as recoupment of ballast is done, in advance.

	are made fit for mechanized maintenance.	
	(v) The use of automotive the tampers will also involve revised spacing of joint sleepers.	Tie-tampers are largely used on long welded rails. Even in locations where the-tampers are used on jointed track no problem is faced because the machines are designed to tamp jointed sleepers and, therefore, revised spacing of jointed sleepers is not necessary.
110	**(vi)** (See Chapter IV. Para 284).	
111	**(i)** to **(iii)** (See Chapter IV, Para 284).	
111	**(iv)** to **(vi)** (See Chapter IV. Para 292).	
112	We leave it to the Railway Administrations to see if the special reports submitted by the permanent way inspectors to the divisional officers serve the purpose of giving the latter a fair idea of the section and of their difficulties; If not, it might be useful to revise the six-monthly reports, if necessary, in an abridged form.	On consideration of the comments of the Zonal Railways, who were generally of the opinion that the system of submission of six-monthly reports by the permanent way inspectors did not serve any useful purpose, it was, decided not to issue any instructions for the revival of this system.
113	**(i)** and **(ii)** (See Chapter IV, Para 296).	
CHAPTER VII-LEVEL CROSSINGS		
114	We reiterate what we had said in Part 1 of	Same remarks as against Item 154 of

	our Report that a census every five years is necessary to determine whether an unmanned level crossing is to be manned or a mannel level crossing is to be upgraded.	Part 1.
115	**(i)** to **(iii)** (See Chapter IV, Par 306).	
116	**(i)** and **(ii)** (See Chapter IV. Pata 311).	
117	(See Chapter IV, Para 316).	
118	(See Chapter IV. Para 322)	
119	With a view to minimizing detention to road traffic at level crossings within station limits, station staff must be educated n see that signals are not taken much in advance of the approaching or the departing train.	Referring to the Railway Board's extant orders on this subject contained in their No. TTIV/15/N/5 of 18-10-66. The Railways were again advised vide Railway Board's letter No. 1V/41/8 of 11-11-70 to ensure strict compliance of these instructions viz. the level crossing gates must not remain closed to road traffic for more than 12 minutes at a stretch and that the station staff should be properly educated in order that signals are not taken off much in advance of the approaching or the departing trains.

120	We suggest that whenever on sec- Lions equipped with multiple aspect signalling lower quadrant two aspect signals protect mid-section level crossings, they should be replaced by multiple aspect signals. It is essential that there should be uniformity in the type of signalling provided on section.	Fully complied with.
121	(See Chapter IV, Para 327).	
122 to 124	122. **(i)** to **(iii),** 123 and 124. **(i)** to **(iii)** (See Chapter IV, 332).	
125	**(i)** We are of the opinion that from now on the construction of level crossings should be avoided wherever possible and reduced to the barest minimum. A level crossing should be provided only when for some unavoidable reason, it is not possible to have an over bridge or an under-bridge.	The acceptance of the policy that construction of level crossings should be avoided altogether would prove a serious constraint in the construction of new railway lines and in the extension of road systems. Road over-bridges/ under-bridges are already being pro- vided where traffic conditions warrant.
125	**(ii)** We hope that the amount collected in the Railway Safety Works Fund would be available to be utilized in future to avoid the	Not accepted. In the case of new rail-way line, the decision whether a level crossing or a road over/under bridge is to

	necessity of new level crossings particularly where such level eros- sings are expected to have heavy road traffic.	be provided, is taken in consultation with the State Government and taking into account the requirements of road traffic and other aspects like topography etc. The cost of such works provided at the time of construction of a railway Une or at any time thereafter in order to meet a railway's statutory liability is chargeable to the Railway. The Railway Safety Works Fund is not available for such works. It can be utilized for works such as construction of road over/under-bridges of existing level crossings and for up- gradation of level crossings etc.
CHAPTER VIII-SIGNALLING AND INTERLOCKING		
126	The techniques of signalling have advanced today to an extent that it is possible to eliminate the chances of fallibility of the human element to a degree not conceived of a few decades ago.	This is an observation.
127	We remarked in Part I of our report that the progress in the introduction of modern	**Items 127 and 128(1) & (ii)** **Initial Views:** The Ministry of Rail-

<table>
<tr><td></td><td>signalling on the Railways had been slow.</td><td rowspan="2">ways did not accept the view of the Wanchoo Committee that the expenditure on signalling on the Indian Rail- ways since the Kunzru Committee Re- port, had been inadequate.
Final Views:
The allotment of funds for S \&T works since 1968-69 to 1977-78 are as follows:
<table><tr><th>Year</th><th>Total in Lakhs of Rupees</th></tr><tr><td>1968-69</td><td>9,81</td></tr><tr><td>1969-70</td><td>8,12</td></tr><tr><td>1970-71</td><td>7,66</td></tr><tr><td>1971-72</td><td>15,98</td></tr><tr><td>1972-73</td><td>15,04</td></tr><tr><td>1973-74</td><td>12,27</td></tr><tr><td>1974-75</td><td>13,16</td></tr><tr><td>1975-76</td><td>14,78</td></tr><tr><td>1976-77</td><td>13,49</td></tr><tr><td>1977-78</td><td>13,73</td></tr></table></td></tr>
<tr><td>128</td><td>(i) We find that of the total capital expenditure on the principal categories of developmental works undertaken by the Railways, about five per cent only fell to the share of development in signalling. This, in our view, is inadequate.</td></tr>
<tr><td></td><td>(ii) We consider that the imbalance reflects not merely a lack of appreciation on the part of the Railway administrations of the role of modern signalling from the point of view of safety but also a lack of realization of the fact that unless signalling keeps pace with developments in other fields, the Railway administrations would be unable to put to the fullest possible use their growing assets.</td><td></td></tr>
<tr><td>129</td><td>(i) The hopes which the Railways entertained about the private sec- tor, to whom they had turned somewhat belatedly, developing indigenous manufacture of sophisticated</td><td>Sufficient indigenous capacity for the manufacture of railway signalling equipment has been developed in the private sector and the railway work-</td></tr>
</table>

	signalling and due to which they forewent development of capacity in a workshop of their own have not materialized. At the same time these expectations seem to have conditioned their thinking so as not to go in for imported equipment.	shops. A stage has now reached that except for a few items like axle counter, which is also being manufactured, though the indigenous capacity for It has yet to pick up the capacity developed in other items is more than what is being utilized.
129	**(ii)** We urge that without any further loss of time, a firm plan integrating the requirements of the Railways, the indigenous resources available and the imports needed should be drawn up with boldness and vision for the next five to ten years and the programme of each year should reflect the attention which modern signalling de- serves but which it has not quite received in the past.	It is now possible to get signalling materials from indigenous sources to the extent funds are available for carrying out safety and line capacity works.
130	(See Chapter IV, Para 347).	
131	We consider that a rigid check should be exercised on the quality of lenses and bulbs used in colour light signals.	100 per cent inspection of bulbs and lenses are being carried out to ensure proper quality of materials.
132	(See Chapter IV, Para 352).	

133&134	(See Chapter IV, Para 358).	
135	**(i)** and **(ii)** (See Chapter IV, Para 364).	
136	**(i)** and **(ii)** (See Chapter IV. Para 372).	
137	We suggest that action should be taken to see that the types of block instruments in use on any one Railway should be reduced to the minimum. It would be advantageous to have one type of block instrument for use on double line and another on single line on each Railway.	Railway Board vide their letter No. 70/W3/SG/G/15 dated 5-6-70 asked the railways to keep this recommendation of the Wanchoo Committee in view while replacing the old and worn-out instrument on age-cum-condition basis. On double line, only IRS type double line block instruments are being provided. On single line, however, Nealas token/tablet instruments, Podanur make tokenless block instruments on non-electrified section and DAIDO type tokenless block instruments on electrified sections are being provided in future installations.
138	We recommend that panel inter- locking	Panel interlocking has already been

	with colour light signals may be provided at stations on electrified sections and on such non-electrified sections where electricity is available.	commissioned at 239 stations and the work is in progress at 240 stations.
139	We recommend that the pace of provision of route relay interlocking should be accelerated not only to speed up operation but also to enhance safety.	Route relay Interlocking has already been commissioned at 74 stations and the work is in progress at 10 stations.
140	We suggest that in yards provided with large route relay installations subsidiary signals which serve the purpose of calling-on signals may be provided below the relevant stop signals with post-type telephones to save detentions to trains.	Calling-on signals are already being provided at major relay interlocking installations. Post type telephones for selective calling and speech secrecy feature is presently under development by the RDSO in coordination with M/s I .T.I. Bangalore.
141	We find that so far, the route relay installations provided at different stations have been of different types having been installed in collaboration with different firms. This arrangement poses serious problems of availability of spares and the	The design of route relay/panel inter-locking installations are now based on standard indigenously manufactured equipment.

<table>
<tr><td></td><td>need to stock a variety of equipment besides training of staff. In our view, the need for standardization of designs, specification and requirements for future installations of this type is paramount.</td><td></td></tr>
<tr><td>142</td><td>We consider that Centralized Traffic Control is an important development to meet the demands of greater safety and efficiency and we hope that in future whenever due to an increase in the density of train service on a single line section the question of creating additional capacity is examined, the case for installation of centralized traffic control would be duly considered keeping in view the additional safety factor which such installation provides.</td><td>Railways ensure that Centralized Traffic Control is duly considered whenever increase of single line capacity by doubling and other methods are under consideration by the Railways. The position as regards the sections on CTC has been introduced, so far, is as below:
<table>
<tr><th>Railway/Section</th><th>Route Kilometrage</th></tr>
<tr><td>North-Eastern Railway Gorakhpur-Chupra</td><td>179</td></tr>
<tr><td>Northeast Frontier Bongaigaon-Changsari</td><td>110</td></tr>
<tr><td>Southern Railway Madras Egmore-Chengalpattu</td><td>55.4</td></tr>
</table>
The Railway Board vide their letter No. 70/W3/SG/G/17 dated 11-5-1970 asked that adequate provision of installation of train describer should be made in all</td></tr>
</table>

		future projects for the installation of centralized traffic control.
143	We consider that 'train describers' which will simultaneously indicate the direction of movement should form a part of centralized traffic control wherever it is installed.	The Railway Board vide their letter No. 70/W3/8G/G/17, dated 11-5-1970 asked that adequate provision of installation of train describer should be made in all future projects for the installation of centralized traffic control.
144&145	144 **(i)** to **(iv)** and 145. **(i)** to **(iii)** (See Chapter IV. Para 375).	
146	(See Chapter IV, Para 384).	
147	We suggest that the Railway Board should reconsider the question of use of Permali fish plates as insulated rail joints on track circuited sections for high speeds in the light of the reported improvement in the design and strength of Permall fish plates.	The continued use of Permali fish plates at insulated rail joints has been considered by the Track Standards Committee. The use of Permali fish plates has not been considered suitable because fish plates of desired crushing strength are not available, and the price of these fish plates is also not competitive and reasonable. As recommended by the Track Standards

		Committee at their 53rd meeting held in July 1977, the Railway Board have approved the discontinuation of further use of Permali fish plates.
148&149	148. **(i)** to **(iii)** and 149 (See Chapter IV, Para 389).	
150	(See Chapter: IV, Para 393).	
151	**(i)** For items for which the Rail- ways depend on the private sector for supply, the effort should be to encourage more than one reliable source so that not only are the benefits of competition obtained, but an eventuality does not arise where the Railway administrations may be left high and dry.	**Items 151 (i) and (ii)** 1. In the case of indigenous items of critical nature, efforts are always being made by the Development Wing to lop parallel sources of supply by advertising the requirements through public media and the firms are encouraged to quote, Firms of proven capacity are entrusted with educational order relaxing the penalty clauses for late deliveries in educational orders. When once the firms execute successfully the initial educational orders they are considered at par with the established supplier for bulk

		requirements.
	(ii) We understand that in countries like Germany, Japan and France, two or three firms of repute who are prepared to invest money in research and development and who have adequate quality control are given assured orders for manufacture of sophisticated signalling equipment. We suggest that the Railway Board develop their thinking along these lines.	2. While forwarding the extract of the recommendations to the Railways vide Railway Board's letter No. 70/RS(G)/ 645/4 dated 23-12-1970, their attention was drawn to recommendation No. 2(b) of the Committee nominated by the Railway Board to examine the question of indigenous development of imported components. The said recommendation which was accepted by the Railway Board reads as under: "2(b) Give a commitment to the entrepreneur that he will get an order for 100 per cent of the requirements for the first year; 80 per cent for the second year; 60 per cent for the third year provided prices are reasonable. The remaining 20 per cent and 40 per cent

		requirements will be obtained by open tender. From the fourth year, there will be open competition."
152	152. We understand that qualitatively, the indigenously manufactured conventional signalling equipment has not come up to the required standard. We suggest that the Railway administration would be well advised to give orders to two or three selected firms of repute so that these firms get interested in maintaining the requisite standards in the manufacture of equipment.	While forwarding the extracts of recommendations vide Railway Board's letter No. 70/RS(G)/645/8 dated 17-6-1970 the Railways were directed to ensure that orders for signalling items are placed only on reputed and reliable firms who have the requisite quality control facilities and who are capable of adhering strictly to the prescribed drawings and specifications and that during inspection, supplies are to the requisite standard. Further review is not called for. More and more signal- ling items are being manufactured in the Railway's own workshops.
153	**(i)** to **(iii)** (See Chapter IV, Para 396).	
154	(See Chapter IV, Para 309).	
155	We suggest that a copy of relevant notes on joint inspections of signals may be sent to	Extracts of joint inspection report are being passed on to the stations

	the station for the reference and facility of inspecting officers visiting the station to enable them to see if the defects and deficiencies pointed out in the joint inspection notes have been rectified.	concerned for necessary action by Station Master and check regarding their compliance by inspecting officers visiting the stations subsequently.
156	We understand that a system of radio-patching in conjunction with Multi-Channel VHF (very high frequency) and microwave system is being used in order to im- prove the efficiency of the control lines and to overcome the difficulties created by the interruption of control circuits. We understand that the Railways have decided to run and man their own line wires instead of depending on the Post and Telegraphs Department. We consider these steps to be in the right direction and hope that these would produce the desired results.	This is an observation,
157	We hope that soon the Railways will be able to develop telecommunication facilities on their system commensurate with developments in other fields as we con- sider	The Railways were asked vide Railway Board's letter No. 69/W3/SG /RAIC/3/1 dated 11-8-1971 to keep this observation in view while planning

	that the fullest use of the assets which the Railways have developed in recent years and are developing can be made only it adequate telecommunications are available.	telecommunication works in the works programme.
158	In view, it would be impossible to attain a high standard of safely, efficiency and economy in working if those responsible for sanctioning the introduction of Improved signalling methods, through ignorance or otherwise, fail to realize the true potentialities of modern signalling and continue to apply the conventional yardsticks of financial justifiability to safety works. To that extent, the present-day concept of financial viability of investment needs to be modified particularly in respect of signalling projects.	Since 1-4-1974 a few of the safety works are being charged to Accident Compensation and Passenger Amenities Fund (ACPAF). A proposal to expand its scope to cover either signalling and safety works is under consideration.
CHAPTER IX-MOTIVE POWER		
159	**(i)** We would strongly recommend that the examining fitters at the incoming pit are chosen carefully after testing them in their proficiency and ability to read and write.	**Items 159 (i) to (iii)** These recommendations of the Wan-choo Committee are being implemented by all the Railways.

	(ii) Booking of repairs by the driver and the examining fitter must be spot-checked from time to time by visiting mechanical officers and inspectors and other supervisors.	
	(iii) The Loco foreman too should in our opinion, be in a position to make spot-checks at least twice or thrice a week.	
160	We suggest that whenever officers of the mechanical department inspect the Incoming inspection pits, they must in particular check the deficiencies in respect of lighting, drainage cleanliness, availability of tools, etc.	This is the existing policy. No further remarks,
161	We recommend that test-checks at the outgoing inspection pit should be intensified.	This practice is being followed.
162	**(i)** We consider it important that there should be no disparity in the concept of repeated bookings ns understood by the different Railways, The definition of repeated bookings should be standardized.	**(Item 162 (i) and (ii)** The definition of repeated bookings and the procedure for recording the same was made uniformly applicable ride Railway Board's letter No. 7031(W)/7/20 dated 4.11.1970 as under: -

	(ii) It would also, in our view, be useful if the form of the re- peated bookings register is standardized for use on all the Rail- ways instead of each Railway following its own system.	"Three consecutive bookings/or booking occurring within an interval of three days of the previous attention at home shed should be deemed to be repeated booking and the locomotive stopped for attention."
163	The limited survey which we have made in respect of repeated bookings shows that there is slackness in the sheds in attending to hooked repairs. There is considerable scope for improvement.	Repeated bookings shall be recorded in a standard register to be maintain- ed by all the Railways on the stipulated proforma. Each register carries engine-wise sheets for recording re peated bookings and a summary sheet for all the engines reflected in re- peated bookings. Instructions for filling up the register have also been given to Railways. Railways analyze such bookings and take corrective measures. The shed foreman and inspecting Divisional/ Headquarter officers also invariably inspect the repeated booking register

		with a view to ensure that all possible action was being taken by shed authorities to avoid repeated bookings.
164	We consider that it would be a salutary step if data in regard to repairs booked repeatedly in respect of certain selected parts of a locomotive are sent by the Divisional Mechanical Engineer periodically for the attention of the Chief Mechanical Engineer himself	**Initial views:** Repeated bookings registers are regularly inspected by the Inspecting officials including the Chief Mechanical Engineers during their visits to the locomotive sheds, Sending of periodical information pertaining to re peated bookings to the Chief Mechanical Engineers is unlikely to serve much purpose. **Final views:** In view of the recommendation having not been accepted no further action is necessary.
165	The fact that derailments take place due to defective wheels and tyres lends some weight to the assumption that checking and recording of the wear on the tyres is not always done with care, We would emphasize	The Railways record tyre wear of all locomotives so that such records should enable the sheds in deciding when to turn wheels so that between successive schedules there is no case for tyres

	that greater attention should be paid to the gauging of wheels and tyre profiles.	requiring returning.
166	We suggest that the requirements of loco sheds for provision of wheel lathes should be speedily assessed, and such wheel lathes should be provided wherever justified without any loss of time.	16 conventional and 9 underfloor wheel lathes have already been im- ported for the Railways from M/s Rafamet, Poland, All conventional wheel lathes are already in use. 17-wheel lathes have also been ordered on M / s HEC, Ranchi, First lot of five wheel lathes is likely to be delivered by M / s HEC, before 31.3.79 and the remaining 12 by 31.3.80, In addition proposals have been mooted for the import of some more wheel lathes.
167	**(i)** In our view, ultrasonic testing equipment is an essential requirement of each major locomotive shed.	Ultrasonic testing equipment has been provided in the major loco sheds.
	(ii) It is necessary that the intervals at which the axles and journals of locomotives should be ultrasonically tested in the loco sheds is laid down.	**Initial views:** The periodicity for testing of axles and journals of loco- motives is already prescribed. **Final views:** No further remarks.

168	(See Chapter IV, Para 145)	
169	We suggest that a detailed sur vey of the facilities, equipment and machines, etc., available in and required for each loco shed on a Railway should be made by a senior mechanical engineer of the Railway and effective action should be taken thereafter to make good the deficiencies.	Initial views: Steam loco sheds various Railways have been equipped according to the maintenance work on these Railways and the distribution of repair work between sheds and the workshops. Any further needs that arise are taken into account at the time of formulation of machinery and plant programme each year. Final views: Further to the above views, it is pointed out that type plans for diesel sheds have been laid down by the RDSO and are progressively Implemented.
170	Since the method adopted by the Northern Railway of maintaining in each loco shed a graph which shows at a glance the position of schedule repairs to locomotives is yielding satisfactory results, we recommend that its adoption on other Railways be considered with such modifications as local	All Railways are now maintaining such graphs.

	conditions may require.	
171	**(i)** We are disposed to think that the system of assigning engines, to inspectors of mechanical department, ensuring as it would personalized attention to the loco- motives by a nominated inspector, would be conducive to better maintenance.	**Items 171 (1) and (ii).** **Initial views:** Standing instructions to this effect exist and this practice is already being followed by all the Rail-ways. **Final views:** No further remarks.
	(ii) We suggest that the Railways on which the system of assigning engines to inspectors of mechanical department does not exist should examine the merits of this system and adopt it if they consider it advantageous.	
172	We consider it necessary to emphasize that replacements of worn-out machines should be effected as expeditiously as possible.	Lack of adequate funds had so far stood in the way of expeditious replacement of Machinery and Plant. The question of funds has been pursued with the Planning Commission and help from the World Bank in a large way, in this connection, is expected.
173	We suggest that where workshops are not adequately equipped with modern scrag and load deflection testing machines, they should	Scrag and load deflection testing ma-chines are being regularly made use of the workshops.

	be so equipped without further loss of time.	
174	We strongly urge that all loco- motive workshops should be equipped with proper weigh- bridges.	**Initial views:** Since uncompensated locomotives have not been manufactured for several years now, provision of weighbridges in each workshop is not considered necessary. Modern loco-motives are all compensated and do not need weighment in repair work- shops. **Final views:** In view of the recommendation having not been accepted no further action is necessary.
175	We strongly urge that adequate provision should be made in each of the workshops for ultra- sonic equipment for the testing of axles.	Ultrasonic testing equipment has been provided in the workshops.
176	We suggest that a periodic evaluation of the efficacy of quality control in the workshops should be done at the Chief Mechanical Engineer's level.	**Initial views:** The Chief Mechanical Engineers are evaluating the efficacy of quality control in workshops not only by personal inspection of the rolling stock and repaired components, but also by their overall performance in service.

		Final views: Views of the Railway Broad are comprehensive and are being followed by the Railways.
177	We emphasize the need for more detailed information being regularly supplied to the workshops concerned in respect of failures of locomotives arising from poor workmanship so that they can adopt proper remedial measures.	**Initial views:** This is already in vogue. **Final views:** The views of the Railway Board were comprehensive and are being followed by the Railways.
178	We consider that with a careful study of the present defects and a few minor improvements in the design of reflectors and dimmer switches, it should be possible to ensure that locomotives go out with proper headlights and dimmer switches in working order.	RDSO have made a specification and headlights including reflectors are purchased as per this specification.
179	We urge the Railway Board 10 standardize the equipment and the facilities required for diesel loco sheds where they have not so int been standardized so that the Roll ways can thereafter take steps to equip the sheds to the required standard.	By and large, all diesel sheds are equipped with the equipment as per the list recommended by the 9th Diesel Maintenance Group.

180	The facilities in the diesel sheds should be such as can compare favourably with the facilities available for maintaining similar assets in other advanced countries.	Our diesel shed facilities and practices compare favourably with those abroad.
181	We emphasize the need for ensuring that electric loco sheds are equipped with all the necessary machines and plant from the beginning if maintenance of a high standard is to be attained.	Electric loco Sheds are equipped with necessary machinery and plant as laid down in RDSO type plans.
182	We understand that a committee of senior officers has been appointed to go into the question of standardizing the machinery and plant to be provided in electric loco sheds. We consider it a step in the right direction.	List of machinery and plant for electric loco sheds has been standardized and loco sheds are being equipped with machinery and plant accordingly.
183	(See Chapter IV, Para 443)	
184	(See Chapter IV, Para 447)	
185	So long as the VDO type speedo- meters are in use on diesel locomotives, it is suggested that a direction corrector should be fitted.	All diesel locos fitted with VDO speedometers now have gearboxes which enable the speedometer to indicate road speed in both the directions.
186	(See Chapter IV, Para 451)	
187 to	(See Chapter 19 Para 458).	

189		
190	We recommend that anti-slip de vices provided on diesel and electric locomotives should be frequently checked for their efficient functioning.	This is being done regularly.
191	We suggest that both the indications, i.e., visual as well as audible, should be provided on diesel locomotives to give an indication of wheel slip.	The visual device is fitted on all locomotives and is considered adequate. Additional audible device to draw the attention of the driver is not considered necessary where it is not already provided.
CHAPTER X GOODS AND COACHING		
192	The examination and maintenance of wagons and coaches' hos an important bearing upon the standard of safety in railway operation.	No action was called for as this is an observation.
193	(See Chapter IV, Para 471)	
194	(See Chapter IV, Para 476)	
195	We consider that the maintenance of goods rolling stock merits no less importance than yard operation and the occasions on which recourse should be had to the provision for curtailment of time for train examination in	All Railways were advised that curtailment of time for maintenance of goods. rolling stock should be resorted to only in exceptional cases and not as a matter of routine. Ref. Letter No. 70 / TT

	exceptional cases should be few and far between.	(I)/6i/55 dated 2-8-1970. These instructions are being followed.
196	**(i)** Though some Railways have issued instructions in book form for the train examining staff. it seems that some confusion still exists in the minds of staff, particularly about safe-to-run examination.	**Item 196(i) and (ii)** The repairs have been standardized under the following two heads- **(i)** Rejection Standard Examination with intensive repairs. **(ii)** Rejection Standard Examination with safe-to-run repairs.
	(ii) We suggest that the scope of each type of train examination given to goods rolling stock should be clearly defined for the guidance of the staff and the components to be examined and checked, spelt out and incorporated in the rules.	
197	We suggest that apart from defect Investigations' which are under- taken by the RDSO off and on in respect of components	**Initial views:** There is no inherent de sign defect in the wagons in use on the Indian Railways, particularly the IRS

	which re reported to fail frequently, the design of goods rolling stock, particularly IRS wagons should be examined by the RDSO or by a Committee of technical officers to see if there are any inherent defects and if any modifications are necessary in view of the higher speeds being planned.	stock. These wagons have been designed with considerable care and thought and have stood the test of time. When a new design of stock is evolved, a prototype is first built which is thoroughly tested before the design is finalized. Accidents which may be attributed to wagon defects have been showing a downward trend as the following figures will show: **B.G.** / **M.G.** 1963-64: 101 / 117 1964-65: 84 / 112 1965-66: 75 / 85 1966-67: 69 / 82 1967-68: 74 / 97 The RDSO is, however, constantly engaged in suggesting improvements to the various components used on these wagons so that their performance may improve further and maintenance problems reduced. The Ministry of Rail-

		ways, therefore, do not consider it necessary to constitute a special review of the design of the rolling stock in use on the Indian Railways, For higher speeds, however, the design or stock is being carefully checked by the RDSO by actual trials and modified where found necessary. **Final views:** Besides the above views, any defect of component or design is being investigated by RDSO and is also discussed in Carriage and Wagon Standards Committee meetings. New wagons which have been added to the fleet and the design of which was evolved by RDSO in consultation with the users and the maintenance organization, are CRT four-wheeler wagons and bogie wagons such as BOY, BOBY, BOBX, BVGT, etc.
198	We consider it essential that the staff	**Initial views:** Accepted. Apart from the

	concerned with the examination of wagons should be educated in respect of the incidence of derailments caused by the various defects and their consequences in order to provide motivation for a higher standard of workmanship.	periodical refresher courses which are imparted to the train examining staff. the Safety Counsellors particularly those belonging to the Carriage and Wagon department, have the special responsibility of meeting the Carriage and Wagon staff in their charge and educating them in respect of the causes and consequence of derailments attributable to various defects, In addition, the Railway Administrations issue monthly accident bulletins which also highlight the causes of accidents. Such bulletins are widely circulated among the staff. **Final views:** Railway Board's instructions were comprehensive and the same continue to be followed.
199	It is also necessary to provide the essential gadgets for examining the various components and to train the examining staff in their use	Necessary tools and gauges have been provided and their use is stressed up-on.

200	(See Chapter IV, Para 480)	
201&202	(See Chapter IV, Para 486)	
203	**(i)** and **(ii)** (See Chapter IV, Para 492)	
204	**(i)** and **(ii)** (See Chapter IV, Para 499).	
205	**(i)** We find that the percentage of coaches marked sick and detached at stations enroute and at terminal stations other than primary or secondary maintenance stations to the total number of coaches marked sick was 6.2 on the Broad gauge and 8.1 on the meter gauge from April 1967 to September, 1868	Items 205 (i), (ii) and 206 (i) to (iii), A system of investigating coach com ponent failures through a 'Coach Failure Report' as prevalent on the Northern Railway and as recommended by the Wanchoo Committee has been introduced on the railways. The analysis of such defects is being made every half year and is also suitably brought to the notice of the staff concerned.
	(ii) We emphasize that attention to coaches at primary and secondary maintenance centers should be intensified in order to reduce the overall percentage of sick coaches.	See remarks against Item 205(i)
206	**(i)** Running gear defects viz., those relating to axle boxes, bogie frames, spring suspension and brake gear accounted for the	Ditto

	highest percentage of the total number of defects on both the broad and the meter gauges. The Incidence of damage-labelling on this account was higher on certain types of coaches than on others.	
	(ii) The percentage of coaches damage labelled due to wheel defects was also on the high side on both the gauges, particularly in respect of ICF coaches on the broad gauge.	Ditto
	(iii) We emphasize the need for greater attention to coaches at the maintenance depots. We also suggest that a broad analysis of defects which result in damage labelling of coaches should be made at regular intervals and disseminated to the staff.	See remarks against Item 205 (i)
207	**(i)** We urge that a detailed analysis of the causes of electrical defects be made and remedial measures taken to bring down the incidence of sick coaches on this account on all gauges.	Items 207 (i) and (ii) Being complied with.
	(ii) We consider that it would be useful if the stall are made aware of the results of the	

	analysis with a view to improving the standard of examination and maintenance of Electrical installations in coaches.	
208	We suggest that fuses should be provided on both the positive and negative wiring in steel bodied coaches.	Complied with.
209	**(i)** We suggest that the checking of earth leakage with the help of test lamps should be intensified and carried out at the time of both primary and secondary maintenance of carriages.	Items 209 (i) to (iii) Being complied with.
	(ii) We suggest that the observance of these checks should be watched both at the divisional and head quarters' level.	do.
	(iii) Spot checks by electrical engineers and Supervisors to ensure that testing is carried out properly would, in our view, prove highly advantageous in tonning up the quality of work done by staff.	do.
210	210. We suggest that a system for investigation of failures of certain selected carriage and wagon, com- ponents be	Recurring failure of components are investigated thoroughly with a view to take remedial action and minimizing

	evolved on lines com- parable to the investigation which is done at present in case of engine failures.	recurrence. Elaborate instructions were issued to the Railways vide Rail- way Board's letter No. 70M(C)/142/49- dated 31-3-1971.
211	We are glad to know that 'defect investigations in respect of the design of certain components are carried out by the RDSO and modifications are issued as and when necessary. While this is indeed a continuous process, we suggest that results of investigations and recommendations made by the RDSO should be uniformly disseminated to all Railways for appropriate action.	This is the existing practice.
212	**(i)** It is the Railway Beard who should issue instructions regarding modifications setting out the target dates for carrying them out and call for periodical progress reports.	**Initial views:** Modification of standard components to all are authorized by the RDSO in consultation with the manufacturing units. Modifications to non-standard stock are undertaken by the Railways concerned and implementation is watched by the Chief Mechanical

		Engineer. Arrangements are being made to see that the implementation of the more important items is watched by the Railway Board. **Final views:** In view of the recommendations having not been accepted no further action is necessary.
	(ii) We are strongly of the opinion that the whole process of issue of modifications by the Railway Board and thereafter the execution at the Railways' level needs to be streamlined if the effort and thought which go in ordering such modifications for enhancing safety are to serve any useful purpose.	Progress of important modifications/ alterations is being watched.
213	It is suggested that equalizing beams which fail in service should be replaced by those manufactured to RDSO's drawing and specification from class II steel and safety clamps should be provided as suggested by the RDSO.	**Initial views:** Orders regarding replacement of equalizing beams which fail in service by beams manufactured to RDSO's latest drawing and specifications were issued a year ago. The Railway have confirmed

		fitment of safety clamps stock. **Final views:** No further remarks.
214	**(i)** (See Chapter IV, Para 503).	
	(ii) It is also suggested that the plates for the springs may be made from silico manganese steel instead of the present specifications to reduce the incidence of breakage.	Silico-manganese steel is being used for the manufacture of springs to a large extent as far as indigenously available.
	(iii) (See Chapter IV, Para 506).	
215	We asked for information regarding progress of implementation of 10 selected recommendations in the report of Director, Research (Hot Boxes). We do not feel heartened by the progress of the implementation of these re commendations and urge that energetic action may be taken to implement the recommendations.	All recommendations of the Director, Hot Boxes have been implemented and these are checked by supervisors and officers as a regular measure. The incidence of hot boxes has shown a decrease as may be seen from the Yellowing figures.
216	(See Chapter IV, Para 528).	
217	We strongly urge that whatever measures are needed to cause Jessops to fulfil the order placed on them in respect of EMU coaches be adopted.	**Initial views:** The order for 216 Nos. broad gauge DC/EMUs which placed on M/s Jessops in December, 1972 has since been

		completed in March, 1978. There is no other order of EMUs at present outstanding on them. Therefore, no further action is called for. Proposal for placement of an order for 239 coaches (79 three car units and 2 spare motor coaches) on M / s Jessops is under finalisation. Deliveries will commence after 12/14 months from the date of order at the rate of 3 Nos, 3 car units per month. **Final views:** Nil
218	We hope that the increase in the capacity for periodical overhaul the backlog in the periodical overhaul of EMU coaches on the Central Railway would be cleared.	There has been an appreciable improvement in the reduction of EMU coaches overdue POH. Only 5.5 percent of the EMU stock was overdue POH on 31-3-1978 compared to 18.1 percent noted by the Wanchoo Committee.
219	**(i)** to **(iv)** (See Chapter IV, Para 530).	
220	We are of the view that endeavours should be made to im- prove the safety factor in respect of trains running on narrow gauge	In the course of exploring the possibility of providing vacuum brake system on Narrow Gauge rolling stock with

	sections. Locomotives, carriages and wagons should be equipped to the extent possible with vacuum brake apparatus and where this is not possible, alternatives should be evolved as for instance introduction of rail cars, etc. Reliance upon hand brakes for the safety of trains is, in our view, not only out moded but also hazardous.	residual life of 10 years, it was found that the existing locomotives did not have spare steaming capacity to feed the conventional ejectors, Fitment of vacuum brake on existing rolling stock could, therefore, not be proceeded with. New stock, when- aver procured, will be fitted with automatic vacuum brake equipment. The speeds and the loads are gene- rally quite low and the trains can be controlled effectively with the existing brake arrangement. Introduction of rail cars has been tried on so Railways but these have generally not been found economical.
221	(See Chapter IV, Para 541).	
222	(See Chapter IV, Para 549).	
223	**(i)** and **(ii)** (See Chapter IV, Para 553).	
224	We hope that effective steps will be taken to provide adequate capacity in the New Bongaigaon workshop for periodical	The capacity of New Bongaigaon workshop has been augmented.

	overhaul of coaches.	
225	**(i)** and **(ii)** (See Chapter IV. Para 555).	
226	The need to equip every carriage and wagon workshop with adequate ultrasonic testing equipment for testing axles and also equalizing beams of IRS meter gauge coaches cannot be over-emphasized.	All Carriage and Wagon workshops have been provided with ultrasonic flaw detectors.
227	We suggest that special efforts should be made to procure burnishing machines for the workshops.	Recently 12 modern burnishing machines have been procured and installed in railway workshops. This is a continuing process.
228&229	(See Chapter IV, Para 566)	
230&231	(See Chapter IV, Para 577).	
232	We suggest that a programme should be drawn up to replace the outdated or overaged machines in the workshops on a phased basis.	With aid from the World Bank and Planning Commission in process, substantial improvement is expected.
233	(See Chapter IV. Para 583).	
234	**(i)** and **(ii)** (See Chapter IV, Para 590).	
235	**(i)** We are of the view that there is a need for revision of Conference Rules Part III. The rules contain ed in this publication should	Conference Rules Part III have been revised in 1973 and all types of rolling stock have been covered in the rules.

	not only provide comprehensively for the examination and repair of all types of stock which have been introduced on the Indian Railways over the past several years but the provisions having a direct bearing on safety in Railway operation ag distinct from those simply meant to keep the coaches and wagons in good fettle should be clearly specified. We understand that the Railway Board have under scrutiny draft prepared by the IRCA for the examination of all types of coaching stock.	The rejection rules which have a direct bearing on safety have been identified by suffixing the word 'S' before it.
	(ii) (See Chapter IV, Para 595).	
236	The Indian Railways Conference Association publishes annually a Report on the broad and meter gauge wagon pool and neutral control of wagon examination' which includes the results of the surprise checks conducted by the neutral control flying squads. We suggest that the report should clearly specify the percentage of wagons found unsafe-to-run to the total number of wagons checked.	With effect from 1970-71, the Indian Railways Conference Association Re- port on the broad gauge and meter gauge wagon pools and neutral examination of rolling stock will show the percentage of wagons with reject- able defects having a bearing on safety and these figures will be com- pared with the total number of wagons checked. (Our review shows that

		this is being done).
237	(See Chapter IV, Paras 465 and 602).	
CHAPTER XI STORES		
238	We had, in Part I of our Report, referred to the fact that considerable time and energy of the executive officers is spent in cha- sing after the procurement of items of spare parts and stores which are in chronic short sup- ply. The position as indicated by the evidence tendered before us in regard to the supply of such stores seems even worse than we had thought.	**Items 238 and 239** The recommendations were brought to the notice of the Railways emphasizing the need that suitable steps should be taken to ensure effective functioning of the Progress Sections to see that stores are available to the indentors in time and in sufficient quantities.
239	It is of vital importance that to maintain locomotives, rolling stock, signalling equipment and permanent way to prescribed standards, the supply es that convey spare parts and stores from the supplier to the ultimate user keep moving with clockwork precision.	The supply position of both purchase and shop manufactured items is dis- cussed in the periodical meetings of the Controllers of Stores held yearly with the Railway Board under the heading "Compliance of Demands". The Railway Stores department have been impressed upon the necessity of ensuring timely compliance of the demands. In regard to non-stock items, enhanced powers to the

		consuming departments have been given to deal with their urgent requirements. The powers of the Controllers of Stores as well as the Depot Officers for emergency purchase as well as for cash purchases have been enhanced with a view to enable them to meet the shortfalls in stock arising out of failures of the pipeline stores. The statistical information being sent by the Railways are frequently monitored at the Railway Board's level, The compliance percentages have lately suffered a setback due to the multifarious types of rolling stock being in operation, ageing of the newer types of stocks acquired in the recent past needing more spare parts, which added to the lack of creation of mat- ching stores and organisation staff due to the governmental ban imposed since 1972-73 created a severe bottleneck.

240	240. The policy in regard to imports of vital parts required for maintenance of valuable assess as also the procedure of release of foreign exchange needs to be thoroughly reviewed so that not only is the foreign exchange utilized to the best possible advantage but also the short-sighted policy of saving some little foreign exchange at the cost of keeping valuable assets idle is avoided.	This is the existing policy. No further action is called for.
241	The chimerical impression which the compliance percentages of 90 to 95 evoke is apt to prevent the focusing of the administration's attention on the need to stream- line their supply lines apart from the smugness which these percentages induce in the Controllers of Stores of which we found a fair amount of evidence.	The recommendation was brought to the notice of the Railways, who were directed to ensure that even where the overall percentage of compliance is of the order of 90 to 95 per cent it does not give rise to complacency and special watch is kept on the availability and supply of vital items so that adequate and timely supply of such items is maintained. The basis of compiling the statistical information was got examined by a

		committee of three Controllers of Stores and the Railway Board have prescribed revised Performa under letter No. 73/RS(G)/779/22 dated 30-12-1975. Remarks against recommendation No. 239 may be seen.
242	**(i)** Complaints were voiced constantly about the inferior quality of tools, stores and spare parts such as adjustable spanners, screw drivers, bulbs, battery material, rubber rolling rings and other rubber fittings, etc. We are shown certain spare parts and components which though brand new could not be put to use as they were either of the wrong size or they did not match with the components in conjunction with which they were supposed to be used. **(ii)** We have no doubt that the inferior quality of tools, stores and spare parts, apart from turning out to be false economy in the end is highly frustrating in- as much as it throws additional burden on the staff in the performance of their duties	**Items 242 (i) and (ii)** Detailed instructions were issued to the Railways vide letter No. 70/RS (G)/645/1 dated 1-5-70 drawing attention to the Stores Code Para 429, which lays emphasis that Stores should be purchased to specifications rather than to samples and also the instructions issued in this regard from time to time. They were directed that: - **(a)** they should ensure purchases strictly to accepted specifications and from sources having adequate internal quality control; and

	and renders the work of repairs and maintenance more onerous In many instances where due to the unreliable quality of spares parts, shoddy repairs are affected, safety too would be at stake.	**(b)** in case of items where specifications may not have been evolved, purchases should be restricted to established brands of acceptable quality. The instructions already issued are exhaustive and are being followed by the Railways. No further review is called for.
242	**(iii)** It would be more prudent and economical to provide tools stores and spare parts of the requisite quality readily identifiable and covered by adequate guarantees by paying a proper price in the beginning.	The need to insist on all these items being purchased only from firms who have quality control and manufacture according to accepted standards is accepted. Instructions have already been reiterated to the Railways that the lowest tender can be rejected on valid grounds including incompetence and unreliability of the firm.
243	We had occasion, in Part I of our Report, to refer to over-emphasis in accepting the lowest tenders due to the fear in the	The extant rules do not preclude passing over of the lowest tender, if it is otherwise not acceptable on technical

	purchasing authority of criticism which may be engineered by the rejected tenderers, We reiterate that the administration should endeavour to insulate its purchasing officers from such criticism if it is satisfied that the discretion was exercised for good and sufficient reasons.	grounds or incompetence of the firm to supply the stores. This position was reiterated to the Railways in Railway Board's letter No. 68/RS(G) /645/1 dated 28-6-1969 consequent on the observation of the Wanchoo Committee in Part I of their Report. This is covered in remarks against re-commendation 193 of Part I.
244	244. We consider that as a rule all tools and spare parts must have the manufacturers' markings on them.	Accepted. This is also the practice in most cases.
245	We had, in Part I of our report, referred briefly to difficulties which are being experienced in respect of items procurable through the Directorate General of Supplies and Disposals, we have examined in some detail the procedure for, and the position in regard to, the procurement of stores through the agency of the Directorate General of Supplies and Disposals. We find that-	

	(i) Despite the enormous industrial advancement made in the country during the last two decades and the Improved materials management methods which are being employed everywhere the time intervals for processing of indents and procurement of stores have remained more or less unaltered. Their continuance in the present form is, in our view, unjustified.	**Items 245 (i) to(iii)** This is covered in remarks against recommendation No. 192 of Part I.
	(ii) It is unrealistic to expect an organisation as complex as the Railways which has been developing at a fast pace and undergoing modernization to assess its requirements of stores 24 months ahead. Furthermore, factors like an ever-increasing and changing pattern yet of traffic which is closely linked up with the growth of industrial activity in different parts of the country, and the unpredictable law and order situation in the country which on the Railways is reflected in the widespread incidence of thefts of railway material and cases of vandalism, make	See remarks against Item 245 (i).

	precise forecasting of requirements in any event difficult but with a procedure which prescribes a lead time of two years make things impossible.	
	(iii) The position is depressing both in respect of the coverage of indents and the materialization of supplies. Not only was a very low percentage of the indents covered in time, but the extent of delays in the supplies on the basis of originally prescribed delivery periods ranged from 1 to 20 months. In addition to these delays the supplier against several contracts for which the original delivery dates had expired, in some cases years ago, still remain- ed outstanding.	See remarks against Item 245(i).
246	246. We express our keen disappointment over the delay in procurement of railway equipment and stores through the agency of the Directorate General of Supplies and Disposals,	**Items 246, 247, 248 and 249 (i) & (ii)** Railway equipment have since been taken over from DGS&D. In regard to the normal items being procured by DGS&D, common with other Government Departments also, the Rail- ways' Stores Department have been

		given increased emergency purchase powers to enable them to review the shortfalls and supplies in time and take local purchase action till such time supplies from DGS&D materialize.
247	We are of the view that the functions of purchase cannot be divorced from the allied functions of standardization, control on inventory, value analysis and control on consumption. Scientific materials management is possible only if the function of purchase is integrated with the other functions of materials management.	
248	It appears to us that too much has been made of the benefits resulting from bulking and that too little attention has been paid to disadvantages inherent in the system of procurement of stores through an agency not involved in the running of the Railways. In our view, the disadvantages in the system clearly outweigh the advantages.	
249	**(i)** We are clear in our minds that responsibility for the procurement of stores should rest squarely with the Rail- way Board and the Railway Administrations without bringing into the picture the agency	See remarks against Item 246.

	of the Directorate General of Supplies and Disposals.	
	(ii) We think that this will lend stability, permanence and continuity to the procurement of railway equipment and stores and would impart a greater sense of urgency to the officers of the Railways entrusted with the responsibility of materials management.	-do-
250	We have been assured by the Railway Board that they have the basic organisation to replace the agency of the Directorate General of Supplies and Disposals for procurement of their own stores and would be in a position to take this job over. We consider that this is a matter which can brook no further delay.	This is confirmed.
251	We think that with the transfer of the functions of the Directorate General of Supplies and Disposals to the Railway Administration, some reorganization of the	The observation is noted.

	existing system and stream- lining and simplification of the procedure relating to procurement of stores will be necessary to meet the growing requirements of the Railways.	
252	We find that over the years while the levels of prices of materials on the one hand and of the consumption of stores on the other have been rising steadily, the powers of purchase vested in the Controllers of Stores have not kept pace.	The matter regarding adequate powers of purchase is under constant re- view. The powers of purchase of Controllers of Stores at present are as under-. **(a)** Purchase of non-DGS&D items- Rs. 5 lakhs for each individual item. **(b)** Purchase of DGS&D items not covered by rate/running con- tracts concluded by the DGS&D Rs. 50,000/- in each case, **(c)** Purchase of DGS&D items in emergencies Upto Rs. 5 lakhs in each case.
253	253. We consider that the following	The powers of purchase of Controllers of

	suggestions made to us deserve most careful consideration: **(i)** The powers of purchase of Controllers of Stores should be raised to Rs. 50,000 or even Rs. 1,00,000 from the existing limit of Rs. 25,000 with suitable increase in the powers of other purchase officers. The limits of purchase through 'single, tender' in case of cash purchase should be suitably enhanced.	Stores for non-DGS&D items and also DGS&D items in emergencies have since been raised to Rs. 5 lakhs for each individual item. The Railways have been advised to re- draw delegation of the powers of Controllers of Stores to the officers under their control to the extent considered necessary. The powers of the Controllers of Stores to make purchase on 'single tender' basis has since been raised to Rs. 2,000 in each case for non-proprietary articles. and Rs. 10,000 in each case for proprietary articles. As regards the powers to make cash purchases, the limit has been enhanced to Rs. 2,000 in each case.
	(ii) Finance need not be associated for purchase upto Rs. 10,000 and in case of	It has since been decided that prior concurrence of associate finance for

	purchases in which the value exceeds Rs. 10,000 the stages of consultation with finance should be confined only to assessment of quantity, association on tender committee and issue of contract.	issuing of purchase orders is not necessary up to Rs. 10,000 in each case.
	(iii) There is need to develop a proper buyer-seller relation- ship in respect of safety items of stores so that the seller becomes more committed and has a greater stake in his dealings with Railways. For a tie-up of this nature an assurance to one or two firms in respect of each important item that the requirements would be bought from them for a specified period may be necessary.	The recommendation was brought to the notice of the Railways for their information and guidance vide Rail- way Board's letter No. 70/RS(G)/645/ 6 dated 7-6-1970. Remarks against recommendation 151 (ii) may be seen.
254	We feel that the powers of purchase of stores at all levels should be kept under constant review by the Railway Board so that they are adequate to cope with the ever-increasing needs.	This is the existing policy. Powers of purchase commensurate with the actual needs, have been delegated not only to the officers of the Stores department but also to the executive officers in the division.
255	We are of the view that it may be possible to decentralize the stores organization in a	Not accepted.

	manner that the advantages of having stores depots contiguous to theव consuming centers are derived without subjecting the system to disadvantages arising out of larger inventories.	
256	We had, in Part I of our Report, stressed the need to adopt scientific methods of inventory control and modern materials management techniques. We consider that for effective and efficient materials management and the solution of various complicated problems the Railways would do well in seeking specialist guidance from quarters who have the requisite expertise in materials management.	The recommendation has been forwarded to the Railways for information and guidance vide Railway Board's Letter No. 70/RS(G)/647/7 dated 11-6-1970. Remarks against recommendation No. 195 of Part I refer.
257	**(i)** We consider that materials management today is a specialized job. Over-dependence on ill-qualified ministerial staff would create problems for the stores organisation rather than solve them.	The need for imparting training in scientific methods of materials management was examined in connection with Recommendation 63--Part II of the Report of the Wanchoo Committee. The position is that adequate arrangements exist for imparting training to gazetted and non-gazetted staff

		belonging to the Stores Organization for the scientific methods of management. The lectures arranged for the probationers of the stores department at the Railway Staff College, Vadodara, are fully comprehensive and illustrative in detail. For this purpose, services of experts from the Railways and outside the Railways are also utilized. Thus, adequate arrangements have already been made to ensure that staff employed on the job remain adequately qualified.
	(ii) We have no doubt that the recommendations of the Committee of the Controllers of Stores appointed to go into the reorganization of the stores department would go a long way in improving the stores organisation.	The Committee referred to by the Wanchoo Committee was set up in January 1967 and consisted of Controllers of Stores from the Central, Northern and Eastern Railways. The Committee was to go into the nature and conditions of working in the purchase wing of the stores department and make recommendations on the cadres, size and pattern of class III staff in the purchase

		offices, their methods of recruitment and yard- stick for deciding strength of gazetted staff under the then working conditions. This Committee submitted their report in January 1968. The report was examined by the Railway Board, and it was considered in February 1969 that the recommendations of the Committee were, by and large, not acceptable and needed a further review to be conducted by the Efficiency Bureau Directorate of the Rail- way Board. Further it was decided by the Railway Board in 1970 that the question of fixing a yardstick for stores officers may pend for the time being and the present procedure of individual justification on the basis of the existing guidelines may continue. This issue has also been raised by the Committee on Inventory Management in their recommendation No. 104 in the 2nd and

		Final Report of April 1977 that a committee consisting of the Heads of Departments of Stores, Accounts and Efficiency Bureau should be constituted. This committee's recommendation No. 104 has been accepted and a committee consisting of COSs/NR & CR, FA & CAO / WR Director, Efficiency Bureau and JDS(IC) has since been constituted vide-Railway Board's letter No. 77/RS(G)/779/41 of 4-1-1978 who will submit report within six months.
CHAPTER XII-THEFT, VANDALISM AND SABOTAGE		
258	Theft of Rai way equipment and vandalism on the Railways are a serious problem from all ac- counts. Not only is theft of cop per wire widespread on the Railways but the evil extends to components of locomotives, coaches and wagons and electrical equipment having even small copper or brass element.	This observation of the Wanchoo Committee was brought to the notice of the Railways to review the position in the light of steps suggested by the Railway Board from time to time and those devised by the Rail- ways themselves. These are being fully implemented with vigour. (Ref. 68/Sec(Spl)/152/6 Vol-II dated 7-4-

		1970).
259	We consider that the Railway should have a registered mark for railway materials and parts on which such mark can be imprinted as this would obviously make it possible to take effective action against persons in unlawful pos- session of railway property under the Railway Property (Unlawful Possession) Act.	Accepted. The Railways as well as the production units have been instructed suitably vide Railway Board's letter No. 70 / Sec (Sp1)/70/4 dated 24 - 2 - 1978 that all pilferable material which are manufactured in the Railway Work-shops should have in addition to part number, 'IR' marking also engraved/ marked therein for easy identification.
260	260. We feel that cases of wilful tampering with track do not receive from the State Police and the other authorities concerned with law and order the attention that they deserve.	**Items 260 and 261 (i)** The Ministry of Home Affairs were requested vide Railway Board's O.M. No. 68/Sec. (Spl) / 152 / 6 dated 74 - 1970 to issue necessary instructions to the State Governments. The Ministry of Home.
261	**(i)** We find that accidents due to sabotage have been increasing during the last 15 years and the action taken, to trace the culprits has been largely ineffective.	Affairs agreed to issue such instructions.
261	**(ii)** We do not agree with the Ministry of	Items 261 (ii) and (iii)

	Home Affairs that prevention of accidents due to sabot- age is a matter which may be left to be tackled by the Railway Ministry themselves. It appears to us that if the problems were viewed only from the view-point of percentage of train accidents attributable to sabotage, it is apt not place the gravity of accidents resulting from sabotage in correct perspective.	Same remarks as against Items 261 (i).
	(iii) We urge the Ministry of Home affairs to ask the State Governments to take adequate measures to apprehend and prosecute the culprits successfully. Prevention of sabotage falls wholly and solely in the jurisdiction of the State Police.	
262	The Additional Commissioner of Railway Safety is a technical and highly experienced officer independent of the Railway Administration and when after due investigation he comes to the conclusion that an accident was due to wilful tampering with track, the State Police authorities should	**Items 262 and 263** The Railways were instructed vide Railway Board's letter No. 68/Sec(Spl)/ 152/6 Vol. II dated 7-4-1970 to take up such matters with the State Governments at higher level. The Ministry of Home Affairs were also requested to draw the

	ordinarily be guided by the results of these investigations.	attention of the State Governments to the recommendations/observations of the Wanchoo Committee.
263	In the event of a difference of opinion between the State Police and the Commission of Railway Safety in regard to whether the accident was due to sabotage, the Railway administration should not allow the matter to rest at that but should pursue this with the State Government at a higher level	See remarks against Item 262.
264	264. We feel that there is need for suitably amending Section 12 of the Railway Protection Force Act, 1957 and Section 126 of the Indian Railways Act, 1890 in order that a person indulging in theft or destruction of railway property in wrecking or attempting to wreck a train can be arrested and proceeded against with a reasonable chance of success.	There is no proposal to amend the RPF Act, 1957 at present. However, there is a proposal to confer more powers on RPF to investigate and prosecute all kinds of offences relating to railway property and property entrusted to RPF. This is under consideration.
265	We stress that the menace of theft of and tampering with railway equipment is loc	Ministry of Home Affairs were request. ed vide Railway Board's O.M. No. 68/

	serious to be treated merely as an ordinary law and order problem as it adversely affects safety in railway operation.	Sec (5p1)/ 152/6 dated 7-4-1970 to issue necessary instructions to the State Governments. The Ministry of Home Affairs agreed to Issue such instructions.
266	**(i)** It appears to us necessary that steps should be taken to educate public opinion and to rouse the social conscience of the people as to the heinous nature of the crime of sabotage and of activities like vandalism and theft of railway material which result or may result in serious disasters involving loss of life of innocent persons travelling on the Railway.	**Items 266 (i) to (iii).** In 1967 instructions were issued to the Zonal Railways for cultivating a better civic consciousness among the people in general and the youth in particular. The Railways were asked to fully utilize various media viz., AIR, films; posters, cinema slides, pamphlets/ brochures, children's magazines and also arrange talks in schools and col- leges and conducted tours to various railway Installations of students from educational institutions. The zonal Railways have been, from time to time, undertaking social education campaigns by way of participation in exhibitions and trade
	(ii) We make a special appeal to the public men, the educationists and the press who have the opportunity and responsibility of moulding public opinion to do their duty in this connection.	
	(iii) We feel that the Railway Ministry and the State Governments should keep in mind the necessity of such an approach all the time.	

		fairs. Besides this, they have also been issuing display advertisements of educative and nation building character in various newspapers to mobilize public opinion against anti-social activities. The press is also periodically invited to informal gatherings, both at the Railway Board and the Railway level to impress upon them the need to arouse social consciousness against disruptive elements of the society. During Railway Week celebrations special commercial spots are broadcast in Vividh Bharti services of AIR. Periodically, students are also involved in working of the Railways by way of participation in checking ticketless travellers. The TV is also telecasting programmes like cleanliness in railway premises, exhorting public to discourage illegal reservation of tickets, publicizing the better facilities like cushioned sleeper

		berths provided by the Railways to the public and their duties to protect the same etc., through programme like 'Zara Sochiye' in the TV. However, in view of the increasing emphasis on the social education campaign, these orders are being reiterated to the Zonal Railways
CHAPTER XIII-THE COMMISSION OF RAILWAY SAFETY		
267	Under the law, the Railway Board No action. are the Safety Controlling Authority. The responsibility for safe operation of railways, thus, rests with the Railway administration. That responsibility cannot be shared by officers of the Commission of Railway Safety.	This is an observation. No action.
268	We have been assured by the Commissioner of Railway Safety that full cooperation and assistance of every kind is given by the Railway administration to the Com- mission of Railway Safety.	This is an observation.

*Recommendations and observations of the Wanchoo Committee concerning the Commission of Railway Safety were considered by the Ministry of Rail- ways (Railway Board) in consultation with the Ministries of Tourism and Civil Aviation and of Home Affairs. The action taken and present position as advised by the Railway Board has been indicated in column 3. This has been supplemented with the views of the Railway Beard wherever considered necessary.		
269	269. We consider that in cases in which the Additional Commissioner of Railway Safety is unable, due to preoccupation or otherwise, to hold an inquiry into serious accident and requests the Railway ad- ministration to arrange for a departmental inquiry, it should be sufficient if he expresses his views on the findings and the recommendations made where he agrees with the findings of the depart- mental inquiry, instead of preparing his own report.	Ministry of Tourism and Civil Aviation have issued instructions to the Additional Commissioners of Railway Safety directing that henceforth, in cases where an inquiry into an accident en- trusted by them to the Railway Ad- ministration under Rule 8(5) of the Railway (Notices of and Inquiries into accidents) Rules, 1966 as amended by Notification dated 9th August, 1968, they need not draw up a report in the standard form as required under Rule 10 of the said rules in case they agree with the findings of the Railway depart- mental inquiry. In such cases, a copy of the report of the Railway Officers' Inquiry Committee should be submitted

		to their office along with views on the Findings and Recommendations. A copy of the above instructions was also sent to the Railways for information and guidance.
270	**(i)** We are of the view that the Additional Commissioners of Rail- way Safety should inquire into certain types of accidents which are not at present provided for under the rules. We have in mind in particular, two types, namely, (a) accidents at manned level crossings involving collisions bet- ween trains-whether goods or passenger-and road vehicles in which there is loss of life or grevious injury to passengers in the road vehicles and (b) collisions and derailments of goods trains in which there is loss of life or grevious injury to any person.	The Ministry of Tourism and Civil Aviation have issued instructions to the Additional Commissioners of Railway Safety directing that each circle officer should, as far as possible, inquire into two to three accidents per year of the types mentioned by the Wanchoo Committee. The intention is that attempts should be made to inquire into all such accidents in which there is loss of life. A copy of the said instructions was also sent to the Railways for information.
270	**(ii)** The Additional Commissioner of Railway Safety must also make such other inquiries into serious accidents as the Commissioner of Railway Safety considers	Since the recommendation is in conformity with the procedure already in vogue, obviously, no further action is called for.

	necessary for him to inquire into.	
270	**(iii)** The Commissioner of Railway Safety himself may, if he considers fit or if his Minister so requires him, make inquiries into accidents of a very serious nature.	This is already the practice. No further action is called for.
271	**(i)** We consider that the recommendations made by the Additional Commissioners of Railway Safety should be incorporated as an integral part of the accident enquiry report under the heading 'Remarks and Recommendations' instead of being an annexure to the report.	Ministry of Tourism and Civil Aviation have issued instructions to the Additional Commissioners of Railway Safety that Recommendations etc., made in connection with an accident should now form part of the Report under the caption 'Remarks and Recommendations and not as appendices to the report. A copy of the instructions was also sent to Railways for information and guidance.
271	**(ii)** We suggest that line plans showing essential features and photographs, where necessary. should be appended to such accident inquiry reports.	This is the existing practice, hence no further action is called for.
272	In our view, a period of 60 days from the date of accident should ordinarily suffice for the final report to be sent by the	Ministry of Tourism and Civil Aviation have issued instructions to the Additional Commissioners of Railway

	Commissioner of Railway Safety to the Railway Board and the Railway Administration.	Safety laying down the procedure and time schedule for the compilation and sub- mission of railway accident reports. A copy of the instructions has also been sent to the Railways for information.
273	**(i)** From the safety point of view, inspections by Additional Commissioners of Railway Safety are no doubt advantageous.	This is an observation. No action.
	(ii) The reports of inspections by Additional Commissioners of Railway Safety should be forwarded directly to the Railways concerned and copies may be sent to the Commissioner of Railway Safety and the Railway Board.	Ministry of Tourism and Civil Aviation have issued instructions to the Additional Commissioners of Railway Safety, directing them to forward copies of their Inspection Reports directly to the Railway Administrations concerned for necessary action and copies to be sent simultaneously to the Commissioner of Railway Safety and the Railway Board. In the case of the copy to be sent to the Railway Board, the reports should as hitherto be routed through the Commissioner of Railway Safety. Copies of the instructions were also sent

		to the Railways for their information and guidance.
274	It seems to us definitely advantageous that the Commission of Railway Safety remains attached to another Ministry so that its position as a body independent of the Railway Board would be and remains quite clear to the public.	The Commission of Railway Safety continues to be attached to a Ministry independent of the Railway Board i.e., Ministry of Tourism and Civil Aviation, as recommended by the Committee and accepted by the Railway Board
275	We have noted that during the past nearly three decades the Commission of Railway Safety has been attached to different Ministries from time to time depending upon the reshuffling of portfolios and jurisdiction of various Ministries. We recommend that from now on the Commission of Railway Safety should find a permanent anchorage and that this should be with the Ministry of Home Affairs.	**Railway Board's views:** \There appears to be misapprehension in this matter. The Commission of Railway Safety has all along been attached to the Department of Civil Aviation and there has been only a change in the name of the Ministry of which the Department has been formed a part. The present arrangement is working satisfactorily and may continue. **Final views:** This recommendation has not been accepted; the present arrangement has been working satisfactorily.

276	We feel that the manner in which the draft report is at present dealt with robs it of objectivity and independence and, furthermore, results in unnecessary delays in finalizing the report.	**Railway Board's views:** In reference to Para 610 of the Wanchoo Committee's report it is stated that there has been no case of a Draft Report being "subject to the views of the Railway Administration concerned, nor any case of any Officer of the Commission of the Railway Safety being detracted from the conclusions he has reached on the Bottom Margin evidence. However, in if the acceptance of the recommendation No. 272, the practice of sub- mitting draft report will be given up. **Final views:** Ministry of Tourism and Civil Aviation have issued instructions to the Additional Commissioners of Railway Safety, laying down the procedure and time schedule for the compilation and submission of railway accidents reports. A copy of the instructions has also been

		sent to the Railways for information.
277	**(i)** We are of the opinion that the responsibility for compiling the report of an accident inquiry should be placed squarely on the Additional Commissioner of Rail-way Safety concerned.	This is the existing practice.
	(ii) It is the final report which should be sent by the Commissioner of Railway Safety to the controlling Ministry, the Railway Board and the Railway Administration concerned.	Ministry of Tourism and Civil Aviation have issued instructions to the Additional Commissioners of Railway Safety laying down the procedure and time schedule for the compilation and sub- mission of railway accident reports. A copy of the instructions has also been sent to the Railways for information.
278	In case there is any difference of opinion between the Commissioner of Railway Safety and the Railway Board or the Railway Ad- ministration with respect to the conclusions or the recommendations in the report, the difference world have to be ironed out in a conference between the Commissioner of Railway Safety and the	This is the existing practice, hence no action is called for.

	Railway Board in such manner as they think fit.	
279	**(i)** We do not see the merit of an arrangement whereby the rules for conducting of inquiries by the Additional Commissioners of Railway Safety are made by the Minis try of Railways.	**Railway Board's views:** The Rules are, at present, notified by the Ministry of Railways in consultation with the Ministry controlling the Commission of Railway Safety. **Final views:** No action.
	(ii) We suggest that from now on whenever any changes in the present rules are required, these should be considered and issued by the Ministry controlling the Commission of Railway Safety. This Ministry may, when necessary, consult the Railway Board while framing such rules.	This has been implemented.
280	We are of the opinion that it would inspire public confidence in the independence of the Additional Commissioner of Railway Safety if the public including trade unions and the press are admitted to the inquiries. They would, of course, have no say in the inquiry itself but may be present only as observers at	This recommendation has not been accepted. The present procedure is considered adequate.

	the stage when the Additional Commissioner of Railway Safety takes oral evidence of witnesses	
281	**(i)** The accident inquiry report intended for publication should be available to the press soon after its finalization.	Items 281 (i) & (ii) Ministry of Tour ism and Civil Aviation have issued necessary instructions to the Additional Commissioners of Railway Safety. Copies of instructions were also forwarded to the Railways for their information and guidance.
	(ii) If prosecution is decided upon in a particular case, the publication of the report may be with- held.	
282	It is necessary that the entrants to the Commission of Railway Safety should understand clearly that once they opt for the Commission and are selected, they would not revert to Railway Ser vice. The Ministry of Railways should have no further say in regard to their career.	This has been implemented.
283	We expect that if the steps that we have suggested for securing the independence of the Commission of Railway Safety are taken, an inquiry by the Additional Com-2 missioner of Railway Safety will inspire	This is an observation. No action.

	sufficient public confidence and a 'Judicial' inquiry on the Indian Railways would, in course of time, become a rare thing.	
284	We suggest that the present strength of Additional Commissioners of Railway Safety may be increased from five to seven. The jurisdiction of the various circles is a matter to be determined by the Commissioner of Railway Safety in consultation with the Ministries concerned. Meanwhile, the fifth circle referred to in Para 586 of Chapter XIII, which has hitherto been continuing as temporary, may be made permanent.	The recommendation of the Wanchoo Committee has been implemented.
285	It seems to us that the field for recruitment to the Commission of Railway Safety should be widened and there should be no bar to officers of the Railways from departments other than the civil engineering, namely, mechanical, operating and signal engineering being selected. We would like to add that the selection of officers should be in	The recommendation has not been accepted on the basis of the views of the Railway Board which are as under: The nature of duties of the officers of the Commission of Railway Safety is such that they require a high degree of civil engineering knowledge and experience. These posts should appropriately,

	consultation with and on the recommendation of the Commissioner of Railway Safety.	therefore, be filled by officers of the civil engineering department of Indian Railways.'
286	We suggest a pyramid structure of grades for officers of the Commission. In our view, volunteers should be invited from among officers in the Junior Administrative grade.	**Railway Board's Views:** The Wanchoo Committee had recommended that recruitment from the Railways should be to the post of Deputy Commissioner of Railway Safety (G) only, from among officers in the Junior Administrative grade and the posts of Additional Com- missioners of Railway Safety should be filled by promotion. Two grades had been suggested for the posts of Additional Commissioner of Railway Safety. The Government have, however, decided that there should be only one grade for all the posts of Additional Commissioners of Railway Safety (present scale Rs. 2500-3000) which should be filled by transfer from the Railways, officers in the grade of Chief Engineers/ Additional Chief

		Engineers. The Deputy Commissioner of Railway Safety (G) with three years experience in the grade will also be eligible for consideration along with volunteers from the Railways, The Wanchoo Committee had recommended a scale of Rs. 1600-1800 for Deputy Commissioner of Railway Safety (G). Government, however, decided that the post should be in the scale of Rs. 1800-2000. The present scale of the post is Rs. 2000-2250. **Final views:** The recommendation was accepted with modifications and implemented.
287	**(i)** The seniority of officers in the Commission of Railway Safety should be counted from the date of service in the Commission itself.	Implemented.
	(ii) After an officer has joined the Commission of Railway Safety, there should be no question of any further selection as far	Railway Board's views: Same remarks as against Item 286.

	as grades up to Rs. 2000-2500 are concerned.	The recommendation was accepted with modifications and implemented.
	(iii) The selection for the post of Commissioner of Railway Safety should be confined to the officers of the Commission of Railway Safety and no outside railway officer should be imported for this purpose.	Railway Board's Views: Accepted. It has been provided in the Recruitment Rules that the post of Commissioner of Railway Safety will be filled by pro-motion from amongst Additional Com-missioners of Railway Safety. A provision has, however, been made in the rules that in case no suitable officer is available for promotion, the post would be filled by transfer of officers from amongst the grade of General Managers. Final views: The recommendation was accepted with modifications and implementations.
288	We are convinced that the Com- missioner of Railway Safety should have the appropriate secretariat status which in this case would be that of an Additional Secretary to the Government of India.	Railway Board's views: It has been decided that while the Commissioner of Railway Safety should be an officer of the status of Additional Secretary for purposes of pay and equivalence in the Warrant of Precedence, it is not

		necessary to confer on him the secretariat status of Additional Secretary. Final views: The recommendation was partially accepted and implemented.
289	It is a matter of regret that when the salary of General Managers was raised in September 1965, the salary of Commissioner of Railway Safety was not correspondingly raised as it should have been at the same time. We recommend that this matter should be rectified without delay.	**Railway Board's views:** Accepted, the salary of the Commissioner of Railway Safety has been brought at par with that of the General Managers on the Indian Railways with effect from 1.5.1972. **Final views:** Implemented, no further action is called for.
290	While we appreciate the considerations that led the Commissioner of Railway Safety to suggest a shift of the office of the Commission to Secunderabad, it appears to us desirable that the office of the Commissioner of Railway Safety should be located at new Delhi.	**Railway Board's views:** The proposal of shifting the headquarters of the Commission of Railway Safety to Delhi was examined and it was not considered feasible to do so. **Final views:** The recommendation has not been accepted.

291	The Headquarters of the Additional Commissioners of Railway Safety should be at the head- quarters of the zonal Railways except where the jurisdiction of the Additional Commissioner of Railway Safety extends to more than one Railway in which case it should be at the headquarters of one or the other zonal Railway.	The recommendation has not been accepted on the grounds expressed in the views of the Railway Board which are as under: The headquarters of five of the Additional Commissioners of Railway Safety, including those of two additional circles created recently are located at headquarters of the Zonal Railways, In regard to the other two circles, it has not been possible to Implement the recommendation due to hon availability of accommodation at the stations concerned.
292	The annual report on the working of the Railway Inspectorate should continue to be placed on the table of both Houses of Parliament.	This is the existing practice.
CHAPTER XIV-RESEARCH, DESIGNS ORGANISATION AND STANDARDS		

ITS FUTURE ROLE.		
293	We set out the role and the various facets of activities of the RDSO, as we visualize them.	This is an observation and calls for no further action.
294	We were told that efforts of the Organisation in farming out problems of basic research to the National Laboratories, Institutes of Technology or Research Institutions had not met with much success.	This is a fact but efforts continue to be made to get better results. (The present position as advised by the RDSO to the Railway Accidents Enquiry Committee-1978 is as under):- The help of National Laboratories, Institutes of Technology and Research institutions is now being fruitfully utilized in tackling the problems of basic research, as brought out below: The Metallurgical and Chemical Di- rectorate had farmed out a problem of designing a suitable degaussing equipement to the NPOL, Cochin to divert magnetic field at the rail ends for facilitating metal are welding of rails in tracks. After proper study the equipment has been made

		available by the NPOL, Cochin, which was found to be satisfactory during trial welding of rail joints. The Track Wing of the Civil Design Directorate (RDSO). are making efforts to utilize these Institutions [Indian Institute of Technology, Madras and Structural Engineering Research Centre (SERC), Madras] for problems of basic research on concrete sleepers. In addition, the SERC/ Madras is giving technical consultancy for the proposed concrete sleeper fac Lory of M/S, Jay Prestressed at Kosi Kalan and IIT/Madras is giving consultancy to M/S. Orissa Concrete Pro- ducts at Jharsuguda. Efforts for utilizing these institutions for problems of basic research by the Bridges and Structures Wing of Civil Design Directorate are being continued. Problems of pozzolana cement and wind pressure on platform shelters were

		farmed out to Indian Institute of Technology, Madras and Indian Institute of Sciences, Bangalore respectively. Investigations are in progress. The Research Directorate (RDSO) are making efforts to utilize the services of the following institutions for problems of basic research: **(a)** Investigations regarding three-dimensional photo elastic studies of IRN304 clip are being conducted by the Central Mechanical Engineering Research Institute, Durgapur. The project was farmed out in 1977 and the Institute are taking up the work, **(b)** Investigations regarding the assessment of feasibility of using portland cement for RCC works by Indian Institute of Technology, Madras. The study was farmed out in 1975,

		Interim reports have been received. Further investigations are yet to be taken up and final report is awaited. **(c)** Model studies in wind tunnel on passenger platform shelters have been completed by Indian Institute of Sciences, Bangalore and the report sent by them is under scrutiny. This study had been farmed out in 1974. **(d)** Project regarding measurement of temperature rise of traction motors has been referred to Indian Institute of Technology, Delhi during 1972. De-sign has been finalised and proto-type tests have been planned during the last week of May 1978. **(e)** A scheme is being processed for collaboration with Indian Institute of Technology Kanpur for studies relating

		to Track Vehicle interaction.
295	We suggest that with a view to obtaining better coordination with the fundamental rese institutions, laboratories and Institutes of technology, the Director General, RDSO, or his representatives should be, in an ex-officio capacity, on the Governing Councils of those of the National Laboratories and Institutes on whom the RDSO has to lean heavily for the solution of its basic research problems.	Initial views: Director General, RDSO is already represented on the Governing Councils of certain research institutions. The matter in regard to representation on other similar bodies dealing with problems of applied re- search will be pursued.
296	**(i)** The RDSO should concentrate on problems of applied research which may refer to the evolving of ways and means to improve the existing equipment and services or developing of new forms or systems.	**Items 296(i) & (ii)** This is being done.
	(ii) We consider that in the matter of applied research, priority should, for some time to come, be given to problems which are solution within a period of two to three years over the relatively long-term research project.	See remarks against Item 296(i).

297	**(i)** A conspicuous example of a problem needing immediate solution is the designing and standardization of signalling relays on which modern signalling depends so much and which are essential for progressing such works.	**Items 297(i) && (ii)** Initial views: Signalling relays are a highly sophisticated item which have been developed after considerable re-search in foreign countries. Such re- lays are at present manufactured in India by firms of repute in collaboration with established foreign manufacturers. The RDSO is also engaged in developing a suitable design for signalling relays but in the nature of things, it would take time.
	(ii) We understand that a beginning has been made by setting up a Relays Cell in the RDSO, but we consider it necessary to accelerate the pace considerably 30 that relays suitable for our purpose and using indigenous mate rials to the maximum extent can be developed.	
298&299	(See Chapter IV, Para 620).	
300	We are of the view that designing and	**Initial views:** This recommendation is in

	development of machines for special purposes which cannot be purchased as off-the-shelf items from trade should be a continuous activity of the RDSO.	consonance with the policy being followed at present.
301	In our view, adequately equipped sections of the RDSO should be located at the manufacturing units like the Locomotive Works at Chittaranjan, the Integral Coach Factory at Perambur and the Diesel Locomotive Works at Varanasi.	Adequately equipped Inspection and Liaison Cells already exist at the manufacturing units like Chittaranjan Locomotive Works, Integral Coach Factory, Madras and Diesel Locomotive Works, Varanasi.
302	**(i)** We suggest that efforts should also be made to attract the best Indian talent for design work from all sources and to encourage the designing of improved jigs and tools for railway workshops and belter planning of equipment and plant layout fer workshops, loco sheds, sicklines, stations etc.	Items 302(1) & (ii) It is the constant effort of the Administration to attract the best available talent for design development and research work in the RDSO. Since the work of RDSO is on practical problems concerning Railways, the Organisation is manned mostly by men drawn from Zonal Railways. The work of RDSO covers all technical fields of railway activities including workshops, loco sheds, sick lines, etc.
	(ii) We have in view the specialist	

	consultancy service which the RDSO should provide in the designing and equipment of such depots. It is not our intention that the Design Wing of RDSO should function as a general-purpose drawing office at the back and call of the Railways and we would like RDSO to guard against this.	
303	We consider it useful that some sections of the Standards Wing of the RDSO should be located in the Railway Board so that complete sets of standard specifications and drawings can be readily available on demand and references regarding these can be disposed of speedily.	Complete sets of standard specifications and drawings are already maintained in the Railway Beard's office and in isolated cases where any particular drawing or specification is not available, no difficulty is experienced in making the drawing available at short notice.
304	We suggest that the expert technical Standards Committees should invite representatives of the Commission of Railway Safely and some manufacturers of rail- way equipment on a selective basis to participate in their deliberations.	**Initial views:** Views of the officials of the Commission of Railway Safety and designers of railway equipment manufacturers and parties are taken other concerned into consideration in the deliberations of the Standards Committee. The presence of such officials at the meetings of the Standards

		Committee would serve no useful purpose. **Final views:** In view of the recommendation having not been accepted, no further action is necessary.
305	**(i)** We would like to bring into sharp focus the rapid progress being made by advanced countries in the development of signalling and telecommunication, particularly the use of such items as axle counters, train describers, het axle detectors, electronic track circuits and automation in marshalling yards, improv ed communication methods like message dialing and microwave.	Modern signalling and telecommunication techniques are being adopted progressively on the Railways. More and more axle counters are being put into use as an alternative to track-circuiting, particularly when the length of the track circuit is more than 500 meters. Two trial hot box detectors have also been installed on the Eastern Railway and their utility under local conditions is being watched. Electronic track circuits are also being installed in the 25 KV/AC traction areas wherever their use is considered desirable.

		Over 11000 route kilometers of micro-wave UHF links with operator dial- ling facilities and en some sections even with subscriber trunk dialing facilities have been commissioned and work on about 6000 route kilometers are in progress.
305	**(ii)** It has been represented to us that adequate attention has not been paid to investigating problems concerned with signalling and telecommunication peculiar to the Rajt ways or to strengthening the telecommunication network on the railway system. We feel that there is great scope and urgent need for work of this nature in the RDSO and we would urge that this receives its due share of attention.	**Initial views:** The problems concerning signalling and telecommunication are receiving constant attention. Drawings and specifications of signalling equipment in regular use have been standardized. System specifications have also been issued for sophisticated installations such as route-relay interlocking, automatic train control, axle counters and microwave. The telecommunication network on the Railway system is being strengthened as rapidly as possible consistent with the availability of resources.

		Final Views: Railway Board vide their letter No. 69/W3/SG/G/6 dated 5 - 8 – binomial (11,2) asked the Railways to keep the recommendation and above views of the Railway Board in view.
306	**(i)** We are in favour of tests and inspections which are made by the RDSO at the specific re- quest of the zonal Railways, the Railway Board or the Commission of Railway Safety. We would suggest that a suitable organisation may be created in the RDSO so that such requests can be dealt with, without causing interference and Interruption in the other regular approved programmes of the RDSO.	**Initial views:** Arrangements already exist for conducting tests and inspections on request from the Railways. Strengthening of the Organisation would be considered as and when the need arises.
	(ii) The Inspection of material manufactured in the signal and telecommunication workshops should. in order to ensure uniform quality be entrusted to the RDSO.	The inspection of relays, point machines and signal machines etc. manufactured by Signal and Telecommunication workshops are being done by the RDS0.
	iii) We understand that inspection of	**Initial views:** The sampling procedure

	electrical signalling equipment manufactured by the various firms is already undertaken by the RDSO but only a small percentage of production is spected as a test check, In the present stage of development when a number of firms are entering the field and when those already in the field are taking to new items, it is essential that a much larger proportion of electrical signaling equipment is inspect- ed both at the manufacturing stage and at the assembly stage.	for purposes of inspection and testing depends on the product, method of manufacture, etc. and is laid down in the specifications. Whenever occasion requires, such as in the case of developmental items or supplies being made by the firms, now in the field, arrangements exist for increasing the percentage for test and inspection.
	(iv) The inspection organisation of the RDSO should, if required, be suitably strengthened to perform these essential functions.	**Initial views:** The Inspection Organisation in the RDSO is strengthened as and when the necessity arises.
	(v) It appears to us that the inspection units could with advantage be located at Calcutta, Bombay, Madras, etc.	**Initial views:** The inspection units are located at stations most Convenient from the point of view of work.
307	**(i)** We understand that the RDSO have been acting as consultants to the State Trading Corporation and the wagon building	Noted.

	industry. We would like to commend the RDSO on this expanding role and would urge that technical consultations should be provided in full measure to these important clients.	
	(ii) We suggest that such consultation as may be asked for by the Commission of Railway Safety should be made readily available.	Consultancy services from the RDSO are always available to the Commission of Railway Safety.
308	308. We consider that with the expanding band of competent officers and staff and with the growing knowledge and expertise which the RDSO is steadily ac quiring, rendering of consultancy services by the RDSO would progressively increase and more and more confidence will be place ed in its technical advice.	Noted.
309	We consider that the details of projects to which the ADSO should apply itself in future is a matter which would have to be left to the RDSO under the guidance of the Railway Board and the Central Board of Rai way Research keeping in view the	Noted

	requirements and priorities which may arise from time to time.	
310	**(i)** (See Chapter IV, Para 627)	
	(ii) (See Chapter IV, Para 580)	
	(iii) It is necessary that research and development of a self- propelled ultrasonic rail in section car is taken in hand.	See remarks against Item 163-Part II
	(iv) Considerable research and study is necessary to ascertain the limits of safe speed on turn-outs of varying degrees.	See remarks against Item 103 Part II
311	(See Chapter IV, Para 631)	
312	312. We understand that the RDSO is in need of some very important equipment. We see no reason why the work in the RDSO should suffer for want of necessary equipment and would suggest that procurement of equipment should be planned so as to meet effectively the needs of the RDSO.	The need of the RDSO is always kept in view and receives due attention in the allocation of funds and in the procurement of equipment.
313	The increase in expenditure in the course of the next few years consequent on the expansion of the RDSO would, in our view,	Noted.

	be amply justified and be repaid in the form of higher standard of earnings, efficiency, and safe- ty in railway operation.	
314	We strongly urge that foreign exchange needed for the expansion of the RDSO should be res leased as and when required.	Noted
315	It is our opinion that the reorganization of the RDSO required to fulfil the role suggested in the foregoing paragraphs should be carried out within one year.	The expansion and reorganization of the RDSO is a continuing process and due importance is being given to this matter.
316	**(i)** For an organisation like the RDSO to be successful, there should be excellence not only at the top but at each echelon of the hierarchy and the efforts should be to Induct the most suitable officers and staff at all levels with suitable motivating environment.	**Items 316(i) and (ii)** This is already the policy.
	(ii) It is obvious that the RDSO's rules of business and the yardsticks in respect of its staff, equipment and materials, financial powers, etc., may have to be different from those which are applicable ordinarily to the Railway administrations.	

317	To ensure that there are no holdups or handicaps to progress anywhere in the organisation, the overall head of the RDSO should be the Chairman of the Railway Board to whom the Di- rector General should report direct.	**Initial views:** The Director General, RDSO, reports to the Railway Board and this arrangement has worked satisfactorily. **Final views:** At present DG/RDSO reports to Member Engineering, Railway Board.
318	The Director General, who is the functional head should appropriately be selected from amongst the experienced General Managers with a flair for research.	The appointment to the post of Di- rector General is made after careful consideration of the suitability of the person.
319	We had suggested in Part 1 of cur Report that the head of the RDSO should have a long enough tenure to make an impact on the organisation. If this involves a still higher grade for the post temporarily to enable the incumbent to continue, the upgrading would, in our view, be justified.	This is already the policy.
CHAPTER-XV ACCIDENT STATISTICS		
320	In order that statistics of train accidents to be	Detailed instructions have been issued to

	of use, it is important that they should identify at least broadly, the primary causes of the various types of train accidents. Only then can the administration's attention get focused or, the various basic causes which give rise to accidents.	show the cause wise details of accidents, the returns to be sent quarterly, showing cumulative data to end of June, September, December and March. The statement for the quarter ending March to replace the annual returns sent hitherto (refer letter No. 69 Stat-1/32 General/RAIC dated 5-5-1973 and gazette notification No. S.O 166 dated 16-11-1973). All railways are sending the returns in accordance with the revised instructions and proformae.
321	**(i)** We find that the statistics of train accidents as compiled in statement 41 of the Supplements to the Annual Report on Indian Railways at pre- sent are oriented only to-wards their number and con- sequences.	The revised format provides for cause-wise details of accidents. A Railways are sending the returns in accordance with the revised instructions and proformae.
	(ii)A small pamphlet 'A Review of Accidents on Indian Rail ways' published annually at-tempts an elementary analysis of causes under certain broad heads in respect of collisions and derailments.	This is an observation. No action.

322	While even broad beads of causes may have some value, the statistics of train accidents to be of intrinsic value should, in our opinion, itemwise these broad heads further so as to be of value to the administration.	The broad heads of the causes have been further sub-divided and itemized to facilitate analysis and remedial measures. The data in respect of number of items are being compiled traction-wise. All Railways are sending the returns in accordance with the revised instructions.
323	We suggest that the accident statistics under different heads should be compiled on all the Railways on a uniform basis and instructions which leave no room for ambiguity should be issued to all the zonal railways.	Detailed instructions were issued to the Railways for compilation of data on an uniform basis All Railways are sending the returns in the revised format.
324	We suggest streamlining of the classification of accidents For instance- **(i)** Fires in diesel or electric engines are more in the nature of engine failures than accients to trains, and a more accurate indication of the nature of such occurrence could be given if they were to be brought under the broad	**Items 324 (i), (ii) and (iii)** Instructions have been given to the Railways that cases of fires in diesel and electric locomotives are to be included under item No. 1.06 of Table 2 as they are more in the nature of engine fallures than accidents (Refer letter No. 69/Stat. 1/32/General/RAIC dated 5-5-1973).

	head failure of railway equipment.	
	(ii) Fires in trains should, in our view, encompass of fires in vehicles and wagons only.	
	(iii) If necessary, fires in electric and diesel locomotives may be brought under a separate sub-head under the general board 'engine failures to isolate them from the mass of figures included under engine failures.	
	(iv) Time failures of engines under the broad head failure of railway equipment' are reckoned on the basis of delays of one hour or more caused to trains due to malfunctioning of train engines. While such standards may have been all right for steam traction years ago, we consider them inapt in the pre- sent day conditions, particularly in case of diesel and electric locomotives whose efficiency index must be very different, and for which a much shorter duration should in our view, be prescribed.	After considering all factors including the problems connected with maintenance of diesel and electric loos, duration of failures for reckon- ing Time failure' has been reduced from one hour to 30 minutes in the case of such locomotives (Ref. 73/ Stat (Accdt.)/32/Genl dated 14-12- 1973).
	v) We notice that at present failure of	Accepted. The following items have

	railway equipment includes only failures of rolling stock, permanent way and overhead electric wires. Failures of signalling apparatus are not included under this head. A breakdown of signalling installations can cause heavy delays in train running if not a complete stoppage of movement. We, therefore, suggest that a breakdown of modern signalling installations or means of communication may also be classified under the head failure of railway equipment.'	been included: - **(i)** failure of route relay interlocking **(ii)** failure of centralized traffic control **(iii)** failure of automatic signalling causing detention to traffic for more than one hour; **(iv)** formal interruption of communication affecting running of trains; and **(v)** any failure of signalling apparatus on the unsafe side.
325	We consider that accident statistics compiled at any time should be examined periodically to assess their value.	This is the existing practice.
CHAPTER XVI-SAFETY ORGANISATION		
326	The four important departments concerned with safety of rail travel are the operating, the mechanical engineering, the civil engineering and the signal engineering departments. In order that rail travel may be safe, it is necessary that each department	Initial views: The responsibility for ensuring safety is recognized by each of the departments mentioned in the observation and each department is doing its bit in the best possible manner. The resultant improvement has been

	should do its bit in the best possible manner.	brought out by the Wanchoo Committee themselves in Para 682 of their Report, Final views: No action.
327	It would be seen that there has been a fall of 44 per cent in the number of train accidents during the last six years and the number during the latest year was the lowest. For this satisfactory performance the credit must ge not only to the safety organisation but to all categories of railway staff including officers, supervisors and railwaymen of all departments as well as the technological aids Introduced. Nonetheless, it is clear that the safety organisation has played a vital role in enhancing the element of safety in rail travel by instilling safety consciousness amongst staff and eradicating short cut methods which jeopardize safety.	This is an observation. No further action is called for.
328	**(i)** We are of the view that the Directorate of Safety has a useful function to perform	This already is the practice,

	inasmuch as it focusses attention at the highest level on matters having bearing on safety.	
	(ii) Analysis of long-term trends of accidents, examination of various suggestions and recommendations to promote safety and following up the implementation of the recommendations coupled with on-the-spot checks to see whether short-cut methods are being adopted and how these can be eschewed are, indeed, highly useful functions. We, therefore, consider that the Director ate of Safety should continue to perform these functions as a permanent measure.	Implemented.
328	**(iii)** We are disappointed to note that the post of Joint Director in the Directorate of Safety was abolished some time ago for rea. sons of economy. The main objective of having a Joint Director In addition to a Director was that at all times the Director or the Joint Director could go out on Inspection and be	**Items 328 (iii) & (iv)** **Initial views:** The post of Joint Director in the Safety Directorate has since been revived, **Final views:** No further action is called for.

	able to see through field Inspections that safety work is carried on by the Railways on the right lines.	
	(iv) We consider this objective unexceptionable and would strongly recommend that the post of the Joint Director in the Safe ty Directorate should be revived. Considerations of economy should not, in our opinion, stand in the way where safety is concerned.	
329	The Transportation Superintendent (Safety) should spend a good deal of his time in inspection from a safety angle. At the same time we think that to keep in touch with the actual trend in accidents and other safety measures which are evolved from time to time either on the basis of accident inquiries or of other sources, he should not be isolated from ease work dealing with accidents.	This is the existing practice.
330	We suggest that the headquarters safety organisation which is headed by a Transportation Superintendent (Safety) may	Fully implemented.

	be strengthened by the appointment, where required, of an officer in the senior scale who would help the Transportation Superintendent (Safety) both in inspections as also in routine case work dealing with accidents.	
331	We are of the opinion that the Divisional Safety Officer in each of the Divisions should be in the senior scale. Wherever the post is held at present by an assistant officer, it should be upgraded.	Fully implemented.
332	As safety must be built into the various departments of the organisation itself and particularly in the departments mainly concerned with movement of trains, we are of the view that Safety Counsellors of departments other than transportation should be sent back to their parent departments. On being sent back to their parent departments these Counsellors should continue to carry on their present functions though under the supervision of their respective divisional	Initial views: It will not be advantageous to upset an arrangement which ensures teamwork and coordinated tackling of problems of safety in railway operation. If these Safety Counsellors are sent back to their parent department, the effectiveness of their functioning is likely to suffer. It is. therefore, considered that the present set-up of the safety organisation should continue, the Safety Counsellors of different

	officers.	departments working together under the control of the Divisional Safely Officer. Final views. No fresh comments.
333	**(i)** We suggest for the consideration of the Railway Administrations that when Safety Counsellors are reverted to their parent departments, posts of Chief Permanent Way Inspector, Chief Loco Inspector, Chief Carriage and Wagon Inspector and Chief Transportation Inspector should be created in lieu of the existing posts of Safety Counsellors on each Division.	In view of the remarks given against item 332 Part II, the present designation of Safety Counsellors would continue.
	(ii) The functions of these Chief Inspectors should be to carry on the work of safety by educating the staff in correct methods of working, propagating the Importance of safety by mass communication methods and reporting to their divisional heads about any defects found by them during the course of their checks on the line which jeopardize safety. These posts, in our view, should be in Class II. We consider that in the selection of	Initial views: In view of the remarks against Item 332, the present designation and status of Safety Counsellors would be retained.

	such Chief Inspectors their aptitude, sense of mission and dedication to the cause of safety should be the primary considerations and they should be hand-picked men.	
	(iii) The Chief Inspectors should concentrate on personal contact with the staff whom they are required to guide and train in safety measures. One aspect of their approach should be the importance which the staff should attach to their own personal safety.	Accepted with modifications and suitable instructions have been issued to the Railways.
334	**(i)** We understand that the safety camps which had proved to be useful were given up some time ago. We would urge that these short safety camps should be revived.	Items 334 (i) and (ii) The orders issued to the Railway vide Railway Board's letter No. E (Trg) 1-67/TRI/185 dated 26-12-1967 to wind up Safety Camps progressively after all the staff in the prescribed categories had been put through Safety Camps once, were reviewed again in terms of the decision arrived in the General Managers' Conference with the Railway Board and the Minister for Railways in
	(ii) These safety camps should not be confused with the regular re- fresher courses as safety camps are not intended to deal with rou- tine rules and procedure. Their objective is to invigorate the safety consciousness of the staff.	

		November 1970. The Railways were, therefore, advised vide letter No. E (Trg)I/71/TR1/12/1 dated 22-3-1971 that safety camps may bed again for the categories of staff for whom these camps were arranged previously on the same lines as was done in the past. The Railways have also been advised vide D.O. letter No. E(Trg)1/71/TR1/ 12/1 dated 9-10-1975 that safety camps should not be mixed up with refresher courses and that the running of the safety camps should not become a rout line and the instructors, safety officers and the Transportation Superintendent (Safety) should make frequent inspections to see that the safety camps are being run in the best possible manner and are serving the purpose intended
335	We like to make a mention here of a highly enterprising effort made by the Divisional	The recommendation has not been accepted.

	Superintendent and his officers at Luck- now in making a safety moder car which we had opportunity to see. We were impressed by the initiative of the Divisional Superintendent and his officers and would recommend that other divisions of the Railways may a adopt similar imaginative methods.	
336	**(i)** A majority of the fatalities to railway staff are understood occur to those railwaymen whose work exposes them to the danger of being struck down by trains or by other moving vehicles yards. In order to deal with this. the Railways in the United Kingdom have devised high visibility clothing in the form of short highly visible jackets to be worn over the normal clothing so that the men on or near the track are more easily seen by drivers of approaching trains both during day and night.	**Items 336 (G) & (ii)** Initial Views: High visibility clothing may be advantageous in countries where conditions of impaired visibility like foggy weather etc. are persistent and prevail for long durations. In India, however, where visibility conditions are generally fair, such clothing would have little utility. Moreover, according to the experience of the Indian Railways, there are not many cases of fatalities of railway staff on duty due to their not being adequately visible to the drivers of
	(ii) We recommend that this device in an appropriate form be introduced on the Indian	

	Railways for the safely of railwaymen.	moving trains or engines or to these conducting shunting's. Final views: The recommendation has not been accepted.
337	337 **(i)** We warn against the inspections of supervisors and officers in the safety organisation becoming routine inspections like those of other departmental supervisions departmental officers.	Accepted and suitable instructions issued to the Railways.
	(ii) Inspections and spot checks by those in the safety organisation should be devoted solely to high- light unsafe methods of working and how they can be eschewed without undue detriment to speedy movement of traffic.	This is the existing practice. Instructions issued to the Railways in respect of Item 337(1) hold good in this case also.

GLOSSARY

Advanced starter signal- when a train leaving a station is guided by more than one starter signal, the outermost of these is the last stop signal of the station and is called the advanced starter. The advanced starter signal is placed outside all connections on the line to which it applies.

Axle Counter- means an electrical device which when provided at two given points on the track enables to know if the portion of track between the said points is clear of a train or vehicles. This is made possible by counting axles in and counting axles out.

Automatic Block System- is a system of working trains in which the trains control the operation of signals and the requisite headway between them is secured automatically by the use of track circuits or axle counters.

Block Clearance Points- indicate the end-limits of a railway line at a station within which station operations, such as shunting, etc. may be performed under the control of that station.

Cab Signalling is an arrangement in which the aspect of the signal ahead is repeated in the cab of the approaching locomotive,

Centralized Traffic Control (CTC) -means a system by which the working of trains, including the operation of all points and signals, over a route to which it applies, is controlled remotely from a designated place.

Colour light signals are those in which the aspects are displayed by fixed coloured electric light or lights both by day and by night.

Complete Track Renewal- means renewal of both rails and sleepers on a continuous length of track. Through Rail Renewal and through Sleeper Renewal mean separate renewal of rails and sleepers respectively on a continuous length of track.

Continuous Welded Rail (CWR)- comprises of a rail welded continuously over a long length.

Distant signal signifies to the driver of an approaching train to proceed with caution when distant signal is 'on' and, to proceed ready to pass the next signal at the prescribed restricted speed or at the maximum speed permitted when distant signal is 'off'.

Fouling Mark- whenever two lines join or cross one another, the fixed standard dimensions are infringed, the point of infringement is indicated by a mark fixed on the ground which is called Fouling Mark.

Hallade Track Recorder is a portable instrument which when carried in a train, produces a graphic record of the various parameters of track over which the train moves.

Track Recording Car- is an instrumented vehicle which when run on track provides a continuous record of the track parameters namely, uneven- ness, twist, gauge, supper-elevation and curvature or alignment, etc.

Two-aspect signalling- means an arrangement of signalling in which each signal is designed to display, at any one time, either of the two aspects.

Ultrasonic Flaw Detector- is an equipment used to detect flaws in the axles of locomotives, vehicles or wagons and also detect flaws in rails.

Warner signal- signifies to the driver of an approaching train, either to proceed with caution when warner signal is 'on', or to run through the station when warner signal is 'off'

Home signal- is the first stop signal of a station at which an outer signal is not provided and the second stop signal of a station at which an outer signal is provided. It is located outside all the

points and crossings at a station which an approaching train may have to negotiate while entering a station and, permits a train to enter only when these points and crossings have been properly set and secured.

Long Welded Rail (LWR) is a welded rail the central point of which does not undergo any longitudinal movement due to temperature variations. The length of a LWR on the Indian Railways varies generally from 800 to 1000 meters,

Lower quadrant and upper quadrant signalling-the arms of fixed semaphore signals can be operated either in the lower quadrant or in the upper quadrant. In lower quadrant signalling, the 'oft' position is displayed by day by the inclined position of the arm below the horizontal; in upper quadrant signalling, the 'off position of a semaphore signal is displayed by day by the arm worked to an angle above the horizontal. Lower quadrant signalling is all two-aspect, and upper quadrant signalling is multiple-aspect.

Multiple-Aspect Signalling-means a signalling arrangement in which signals are designed to display at any one time any one of the three or more aspects and in which the aspect of each signal is pre-warned by the aspect of the previous signal or signals for the benefit of the driver of the approaching train.

One engine only system is a system of working trains under which only one train is allowed on the section of the line, on which this system is in force, at any one and the same time.

Oscillograph Car- is a mobile laboratory-cuti-instrument car which enables assessment of the safety and stability of rolling stock as well as the standard of track maintenance. It is fitted with different accelerometers which record the vertical and lateral

accelerations, etc., of the vehicle, This record is useful for monitoring the riding quality of track,

Outer signal is the first stop signal of a station, where it is provided. It is located at a prescribed distance from the Home signal.

Semaphore signal- is a fixed signal consisting of a movable arm on the left-hand side of a post as seen by the driver of an approaching train to which it refers. The aspects of a semaphore signal are displayed by the position of the arm by day and by a light or lights by night. Semaphore signals may be either lower quadrant or upper quadrant depending upon whether the movable arm functions in the lower or upper quadrant respectively.

Starter signal when a train leaving a station is guided by only one starting signal, it is the last stop signal of the station and is called the starter.

Track Circuit- means an electrical circuit formed along with the rails in a portion of the track, which enables to detect the presence of a train or vehicle on that portion of the track.

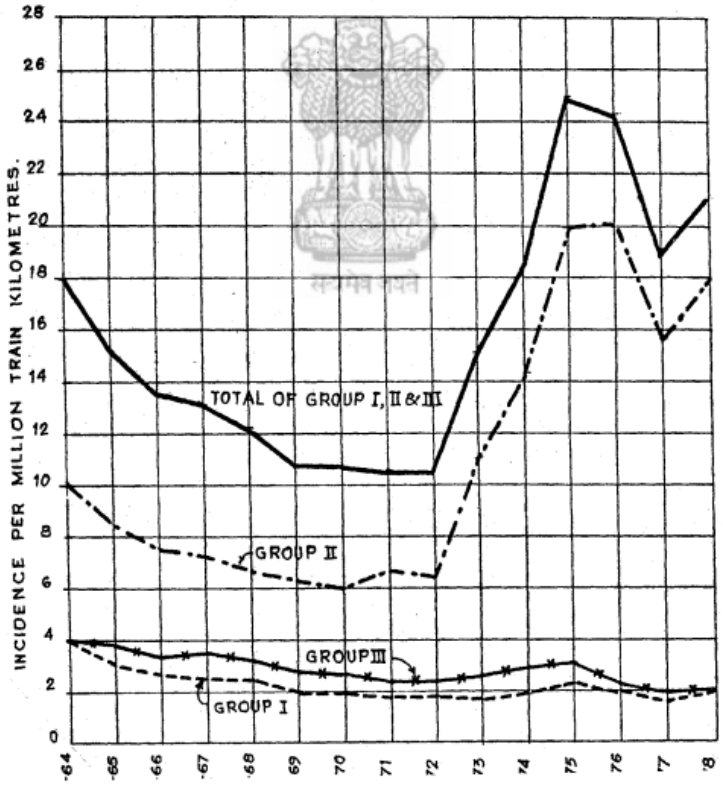
INCIDENCE OF ACCIDENTS IN GROUPS I, II & III ON INDIAN RAILWAYS

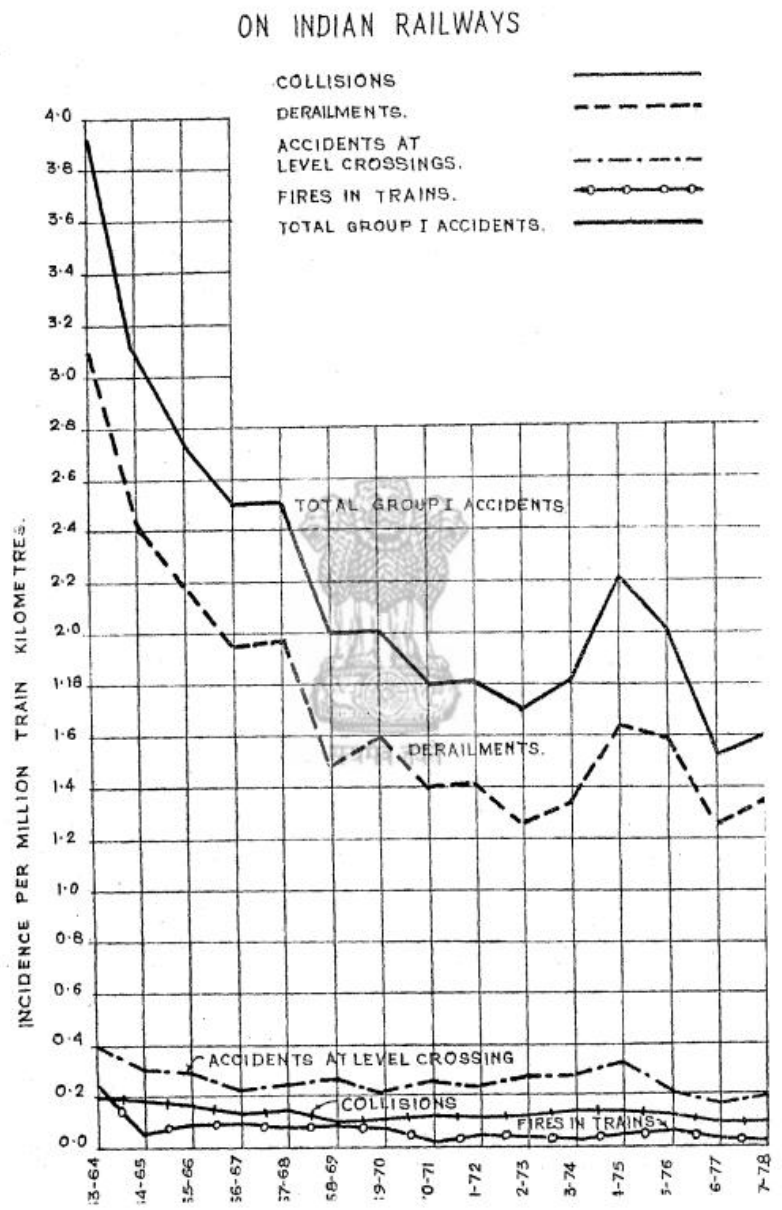
GROUP I OR IMPORTANT ACCIDENTS.

GROUP II ACCIDENTS- FAILURE OF RAILWAY EQUIPMENTS.

GROUP III OR MISC. ACCIDENTS.

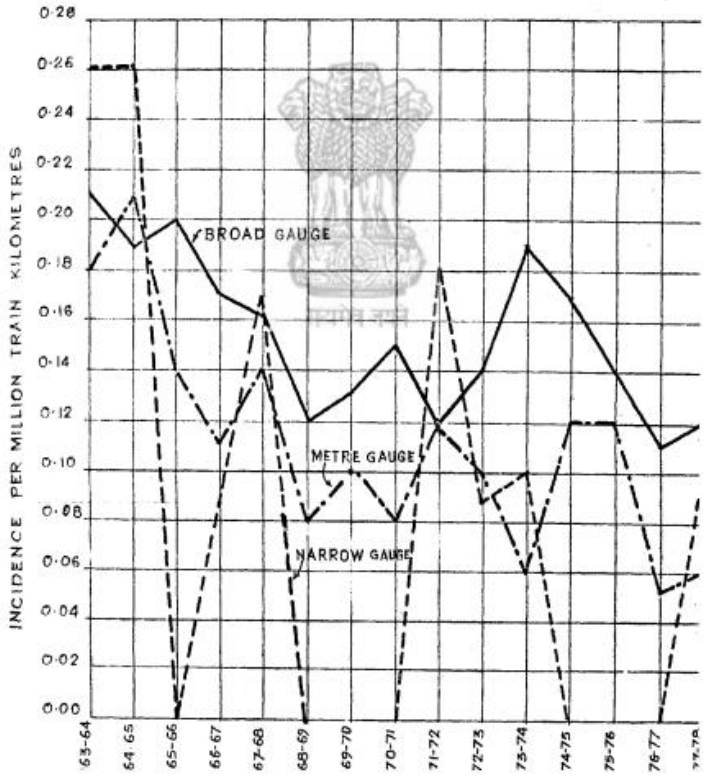
TOTAL OF GROUPS I, II & III ACCIDENTS.

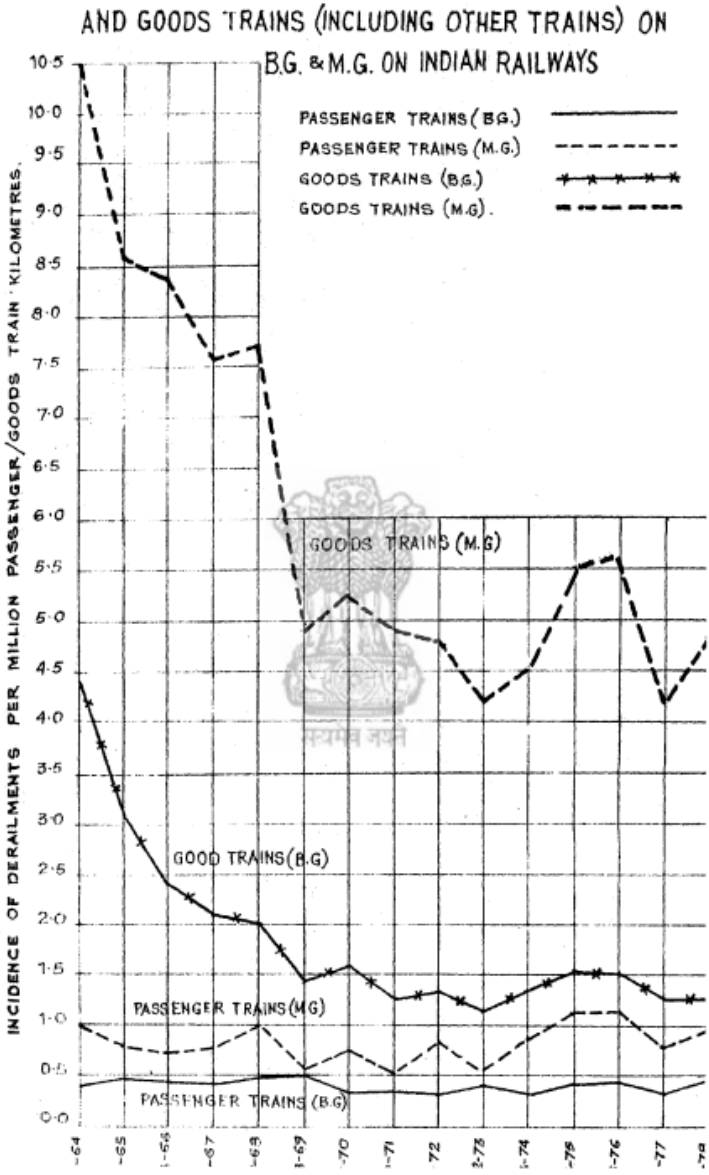


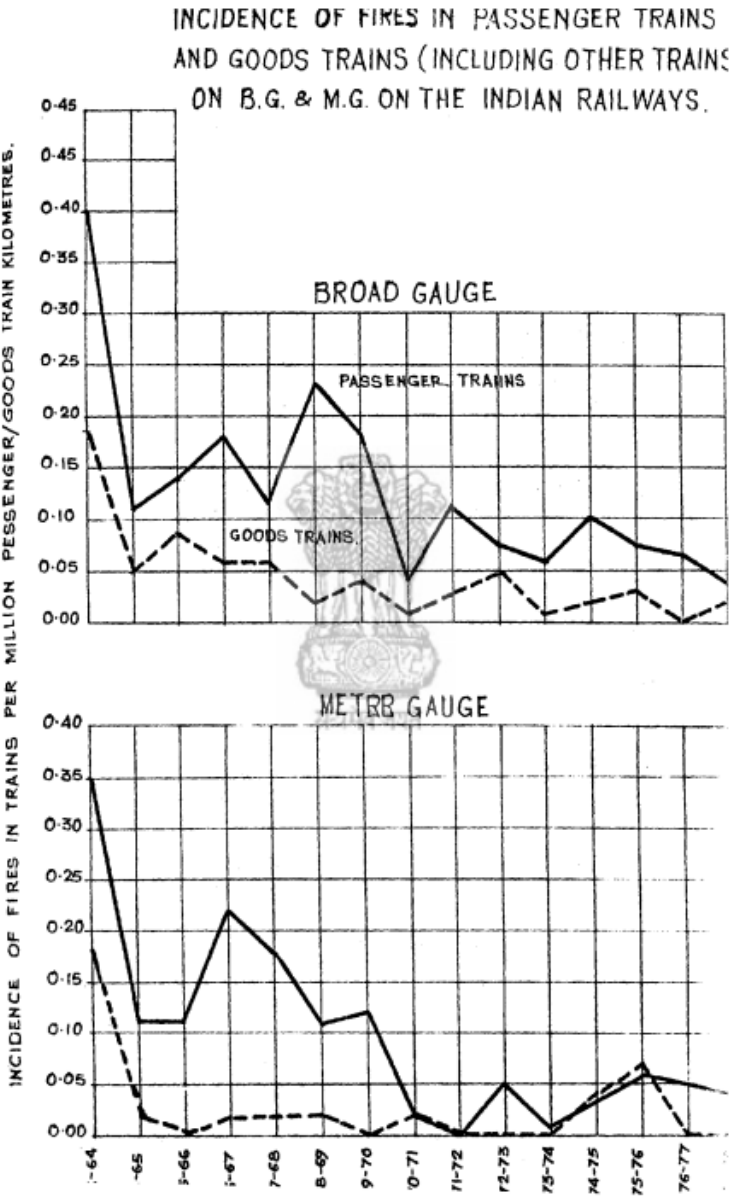

ON INDIAN RAILWAYS
COLLISIONS
DERAILMENTS.
ACCIDENTS AT LEVEL CROSSINGS.
FIRES IN TRAINS.
TOTAL GROUP I ACCIDENTS.
INCIDENCE PER MILLION TRAIN KILOMETRES.
4·0
3·8
3·6
3·4
3·2
3·0
2·8
2·6
2·4
2·2
2·0
1·8
1·6
1·4
1·2
1·0
0·8
0·6
0·4
0·2
0·0
TOTAL GROUP I ACCIDENTS
DERAILMENTS.
ACCIDENTS AT LEVEL CROSSING
COLLISIONS
FIRES IN TRAINS
3-64
4-65
5-66
6-67
7-68
8-69
9-70
0-71
1-72
2-73
3-74
4-75
5-76
6-77
7-78

TRAIN COLLISIONS
ON
THE INDIAN RAILWAYS
GAUGEWISE

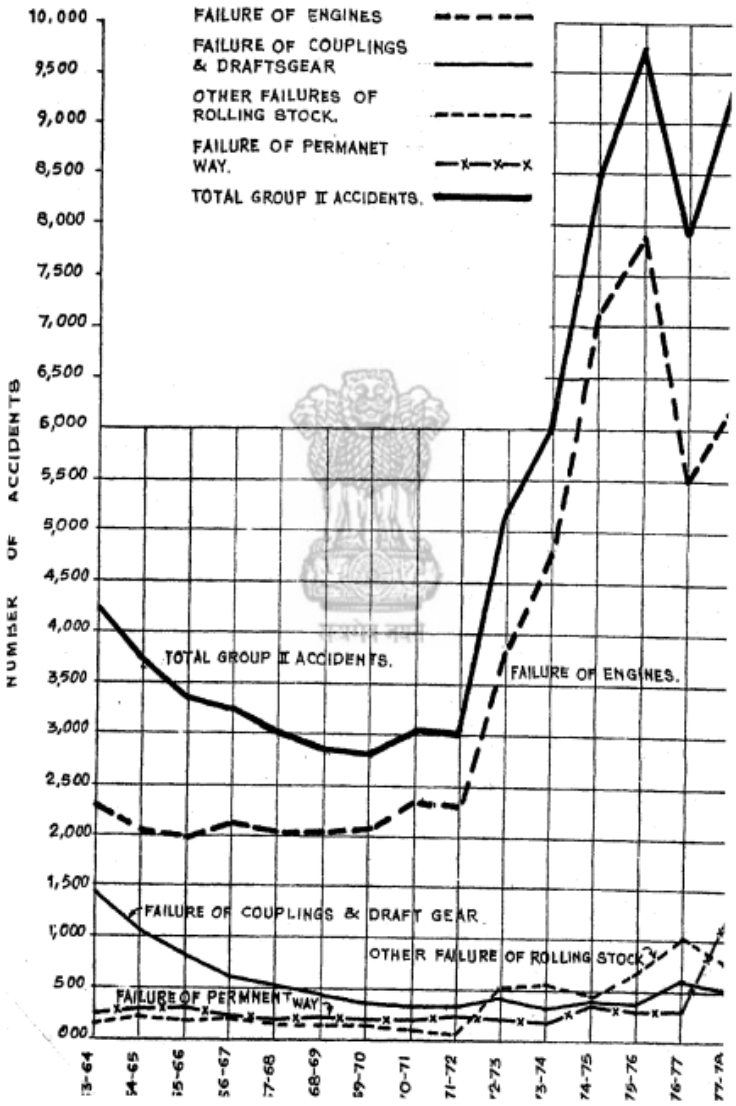
BROAD GAUGE
METRE GAUGE
NARROW GAUGE




AND GOODS TRAINS (INCLUDING OTHER TRAINS) ON
B.G. & M.G. ON INDIAN RAILWAYS
PASSENGER TRAINS (B.G.)
PASSENGER TRAINS (M.G.)
GOODS TRAINS (B.G.)
GOODS TRAINS (M.G).
INCIDENCE OF DERAILMENTS PER MILLION PASSENGER/GOODS TRAIN KILOMETRES.
GOODS TRAINS (M.G)
GOOD TRAINS (B.G)
PASSENGER TRAINS (M.G)
PASSENGER TRAINS (B.G)


INCIDENCE OF FIRES IN PASSENGER TRAINS
AND GOODS TRAINS (INCLUDING OTHER TRAINS
ON B.G. & M.G. ON THE INDIAN RAILWAYS.
INCIDENCE OF FIRES IN TRAINS PER MILLION PESSENGER/GOODS TRAIN KILOMETRES.
BROAD GAUGE
PASSENGER TRAINS
GOODS TRAINS.
METRE GAUGE
0·45
0·40
0·35
0·30
0·25
0·20
0·15
0·10
0·05
0·00
-64
-65
5-66
6-67
7-68
8-69
9-70
10-71
11-72
12-73
13-74
14-75
15-76
76-77

EQUPMENT ON THE INDIAN RAILWAYS





वयं राष्ट्रे जागृयाम

भारतीय रेल परिवहन प्रबंधन संस्थान

रेल मंत्रालय, भारत सरकार

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