





Welcome to a Lecture on



MAKING OF POWER PLAN CREW REQUIREMENT

&

TIME TABLING OF TRAINS

by :

INDRA GHOSH
COM/NR

Tele : +91 – 11 – 2338 – 7976
Mobile : +91 – 97176 – 30900
E – Mail : indraoffice@gmail.com



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Views expressed in this lecture are that of the speaker and may not necessarily reflect the official views of either Northern Railway or of the Railway Board.



Outline of the Lecture



- Power Plan.
- Loco links & Crew requirement.
- Time Tabling of Trains.



Outline of the Lecture



- Power Plan.
- Loco links & Crew requirement.
- Time Tabling of Trains.



Outline of the Lecture



- Power Plan.



Power Plan



- Power plan is prepared by a division for assessing their daily requirement of locos on a long term basis.
- It basically indicates the daily average number of locos required and planned for freight services, section wise* for each division.*
- It helps in long term planning both for locos as also for crews.
- At divisional level.
 - Loco holding.
 - Crew requirement.



Power Plan



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- It basically indicates the daily average number of locos required and planned for freight services section wise* for each division.
- It helps in long term planning for both locos as also for crews.
- At divisional level.
 - Loco holding.
 - Crew requirement.
- At Zonal level.
- At Railway Board level.



Power Plan



- Method given in Operating Manual for working out the Power plan.*
- Power plan consists of 3 components :
 - Main line services.
 - Inferior services.
 - Shunting locos.



Power Plan



- Method given in Operating Manual for working out the Power plan.
- Power plan consists of 3 components :
 - Main line services.
 - Inferior services.
 - Shunting locos.
- This exercise is to be carried out every six months.**
- Bare requirement of locos for traffic use on a division is calculated :
 - on the basis of the traffic turn round and average number of trains run on each section.
- Quite complicated and impractical.*



Power Plan



- Avg. no. of trains run on each section per day and Avg. hours on road for last six months*;
 - duly signed by Sr. DEE(Op)/Sr. DME(P) and Sr.DOM to be prepared.
- Section wise average freight POL for the last six months to be calculated as under :
 - Bare POL = PDD + HOR + PAD*
- 3.5% further growth and 10% bunching allowance to be demanded on Bare POL.



Power Plan



- Loco requirement for DMT, ART and other locos which remain in outage but not added in POL for the purpose of calculation of average kilometers to be added in the bare requirement.*
- To arrive at total POL, last six month average POL of shunting loco link WDS_4 , WDS_5 pilots and Mail lie over powers to be added in the POL calculated above.*
- Mail/Exp./Pass. loco requirement to be worked out on the basis of loco link.
- Add 10% for major repair allowance.



Power Plan



- For shunting services, work out number of points for 8 hours shunting, demand 0.33 POL.
- Add 1 loco as overlap against 6 loco.
- Add 10% for major repairs.
- Kms formula :
 - Total kms earned per day on an average, during last six months divided by average loco utilization.



Power Plan



- My method of working out the power plan.
- Power plan consists of 3 components :
 - Main line locos – including through goods and inferior services.*
 - Lie over powers of Mail/Express links.
 - Shunting locos.



Power Plan



- For through goods locos.
 - Highest daily POL in any one particular month within the division's territorial jurisdiction.*



Power Plan



- For through goods locos.
 - Highest daily POL in any one particular month within the division's territorial jurisdiction.*
- For lie over powers of mail/express links.
 - Highest POL in any 8 hrs. shift on a daily basis.*



Power Plan



- For through goods locos.
 - Highest daily POL in any one particular month within the division's territorial jurisdiction.*
- For lie over powers of mail/express links.
 - Highest POL in any 8 hrs. shift on a daily basis.*
- Add certain % as future growth based on average annual growth of last 3 years.*
- This % should be added both for through goods locos as also for mail/express lie over locos.*
- Add 10% bunching allowance for through goods only.



Power Plan



- For shunting locos :
 - Work out the total no. of shunting loco shifts on the division both for
 - Coaching yards.
 - Goods yards.



Power Plan



- For shunting locos :
 - Work out the total no. of shunting loco shifts on the division both for
 - Coaching yards.
 - Goods yards.
- Add extra shifts required per day for transferring the shunting loco to/from the diesel shed.
- Dividing by 3 gives gives the bare requirement of shunting locos.
- Add 10% for major repairs.
- Round off to the next higher integer.
- Normally, no extra cushions are justified after this.



Power Plan



- Power plan is to be made separately for diesel and electric tractions.



Outline of the Lecture



- Power Plan.
- Loco links & Crew requirement.



Loco links



- At the divisional level loco links of only passenger trains can be made.
- Loco links of intra – railway express trains are prepared at hdqrts. level.*
- Loco links of inter – railway express trains should be prepared at Board level.
- However, these are also prepared at zonal railway, on pairing train basis.*
- For small stretches which are not electrified it is better to super impose a diesel power on top of electric loco for traction bridging.



Crew requirement



- Crew requirement for mail/express trains is worked out on the basis of crew links.
- Ideally, for mail/expresses, actual crew runs should be of at least around 7 hrs. duration.
- For all crew runs which are of less than 4 hrs. duration inter – divisional links should be made.
- For making inter – divisional links, theory of train – kms. *vis-a-vis* guard kms. should be used for deciding ownership of that particular link.*
- If an *ab-initio* exercise is done for re-working crew links there may be savings of at least 5%.*



Crew requirement

- Existing instructions/procedures do not ensure timely availability of crews for newly introduced coaching trains.
- Every time a new express train is introduced, crew links are to be revised and additional crews for new train is to be incorporated in the link.
- Problem comes up because :
 - sanction for additional crews can only be obtained after links are revised.
 - links can only be revised after introduction of new train.*



Crew requirement



- Crew review to be conducted once a year.
- Hence, it cannot be undertaken every time a new train is introduced.
- Problem of repeated requirement of manning additional trains throughout the year.
- There is no problem for a division where only a single new train is to be run.
- But what about a division where 3 or 4 trains are to be introduced throughout the year?
- Since train cannot wait for sanction/promotion etc. crews are inducted from passenger link to express link, and
 - from freight services to passenger link.



Crew requirement



- Over a period of time, after all trains have been introduced, a one time crew review is done and posts are created.
- On an average, there is a time lag of 6 to 8 months between introduction of trains and creation of posts.
- For day to day train running, Leave Reserve available in passenger grade are put to working these trains.
- LR for passenger trains is in turn provided from goods grade.
- Final shortage in any case is felt in freight operations.



Crew requirement



- The exercise should begin in December every year, before announcement of new trains in railway budget.
- A comprehensive zero based review of existing links should be undertaken to tighten up links.
- After announcement of new trains in budget, division should follow the modus operandi explained below :
- Total daily train kilometres (TDKM) to be added on account of these new trains should be worked out.
- Average daily kms. earned by mail/express drivers on the basis of their existing links is already known for each division.



Crew requirement



- No. of additional posts required for new trains should be worked out in advance based on the above.
- 30% LR must be added to this bare requirement.
- Based on this, divisions should propose and create posts for all new trains to be introduced throughout the year.
- However, these posts will be operated in phases as and when each train is introduced and existing links are revised.
- No. of posts to be operated for each train would depend on the revised link + 30% Leave Reserve.



Crew requirement



- Powers on Line (POL) is the single most important factor for working out requirement of crews.
- It is not dependent on Duty hours of crew, Hours on Road, No. of trains run, Power Plan, Traffic projections, etc.*
- Similarly if cushions are required to be added for working out the requirement they have to be based on certain logic.
- Cushions added cannot be ad – hoc, just because we do not want to manage efficiently.



Crew requirement



- Number of crews required at any point of time is directly related to number of loco units available on the division.
- For this purpose, Multis and Consists are taken as 1 loco unit.
- Fundamental principle of crew requirement.
- Whether a loco is stationary or performing shunting or earning 600 Kms. per day, it has to be manned by a driver.
- Crew review freight should be done based on the requirement of 7.6 crews/POL.*



Crew requirement



- Crew shortage is a perennial problem that every division faces.**
- Time lag between processing of case and actual availability of bodies after training is almost 3 years.*
- Anticipated vacancies for next 3 years should be taken.**
- This will be as per the existing crew strength.
- Anticipated increase in crew strength, based on past 3 years growth, both for :
 - Express trains,
 - Freight services.



Crew requirement



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- This will be as per the existing crew strength.
- Anticipated increase in crew strength, based on past 3 years growth, both for :
 - Express trains,
 - Freight services.
- Entire panel from RRB need not be operated.*



Outline of the Lecture



- Power Plan.
- Loco links & Crew requirement.
- Time Tabling of Trains.



Time Tabling of Trains



- May appear to be simple exercise to a layman.*
- It is both a science as also an art.
- It is a science because there are certain rules and guidelines laid down for time tabling.
- It is also an art because application of these rules and guidelines have to be tempered with judicious mixture of :
 - user requirement,
 - passenger sensitivity,
 - local characteristics,
 - operational constraints, and
 - other factors that are part of day to day operations.



Time Tabling of Trains



- When a new train is to be introduced, rarely do we come across a case where everything is laid out for us.
- In most cases :
 - spare terminal capacity will probably not exist,
 - clear cut washing line slot will not be available,
 - stabling line berths would not be spare, etc.



Time Tabling of Trains



- When a new train is to be introduced, rarely do we come across a case where everything is laid out for us.
- In most cases :
 - spare terminal capacity will probably not exist,
 - clear cut washing line slot will not be available,
 - stabling line berths would not be spare, etc.
- Under such circumstances, changes will have to be made in the present time schedule of some existing trains to accommodate this new train.



Time Tabling of Trains



- There are 4 distinct categories of trains whose requirements are different as far as time tabling is concerned :
 - High speed Rajdhani/Duronto/Shatabdi Expresses.
 - Mail/Expresses and other Inter – city trains.
 - Suburban services.
 - Passenger trains.



Time Tabling of Trains



- Criteria for deciding on the arrival and departure time :
 - Type of service,*
 - Duration of journey,*
 - Terminal which has the most severe constraint,*
 - Washing line,*
 - Stabling line,*
 - Platform availability,*



Time Tabling of Trains



- Criteria for deciding on the arrival and departure time :
 - Type of service,*
 - Duration of journey,*
 - Terminal which has the most severe constraint,*
 - Washing line,*
 - Stabling line,*
 - Platform availability,*
 - Actual path available for getting into a major terminal,
 - Rake link.*



Time Tabling of Trains



- Criteria for deciding on the arrival and departure time :
 - Type of service,*
 - Duration of journey,*
 - Terminal which has the most severe constraint,*
 - Washing line,*
 - Stabling line,*
 - Platform availability,*
 - Actual path available for getting into a major terminal,
 - Rake link.*
- Different scenarios worked out, 2 – 3 alternatives listed.
- Adjustments made in timings of existing trains.



Time Tabling of Trains



- Actual charting of the train is carried out based on :
 - Maximum permissible and booked speed,*
 - Bare running time,
 - Permanent speed restrictions,
 - Stoppages and their duration,
 - Acceleration and deceleration,
 - Engineering recovery time,
 - Traffic recovery time,
 - Crossings and precedence,
 - Platform berthing at intermediate stations,
 - Attaching detaching of slip coaches, if any,
 - Traction changing, if any.



Time Tabling of Trains



- Maximum permissible speed differs from section to section.
- It can also differ from train to train on the same section.
- Depends on the following :
 - Track structure,
 - Type of locomotive,
 - Type of coaches,
 - Load of the train.



Time Tabling of Trains



- Maximum permissible speed differs from section to section.
- It can also differ from train to train on the same section.
- Depends on the following :
 - Track structure,
 - Type of locomotive,
 - Type of coaches,
 - Load of the train.
- Booked speed of the train is usually kept at 90% of the maximum permissible speed.*
- This margin of 10% is called loco recovery time.*



Time Tabling of Trains



- Bare running time is calculated by means of a calculator,
 - by dividing the length of the block section by the booked speed,
 - then adding the time lost due to permanent speed restrictions, and finally
 - rounding off to the nearest minute.*



Time Tabling of Trains



- Other factors which should also be taken into consideration for calculating bare running time include :
 - Time loss on account of brake feel test.*
 - Time loss on account of switching over from North line to South line or *vice – versa*.



Time Tabling of Trains



- Other factors which should also be taken into consideration for calculating bare running time include :
 - Time loss on account of brake feel test.*
 - Time loss on account of switching over from North line to South line or *vice – versa*.
- These are generally not considered at present.
- As a result they get adjusted against TR time on run.*



Time Tabling of Trains



- Stoppages and their duration depend on :
 - Type of service,
 - Commercial requirement for :
 - Entraining/detraining,
 - Reservation quota,
 - Meal halts,
 - Loading/unloading of parcels.



Time Tabling of Trains



- Stoppages and their duration depend on :
 - Type of service,
 - Commercial requirement for :
 - Entraining/detraining,
 - Reservation quota,
 - Meal halts,
 - Loading/unloading of parcels.
 - Operational requirements include :
 - Watering stations,
 - Crew changing points, etc.



Time Tabling of Trains



- Time taken for acceleration and deceleration varies from train to train depending on a number of factors.
- Earlier, uniform time of 2' for acceleration and 1' for deceleration used to be taken.
- Presently, we follow a graded scale depending on :
 - Speed of the train,
 - Load,
 - Type of station,
 - Type of locomotive,
 - Type of coaches.



Time Tabling of Trains



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- Earlier, uniform time of 2' for acceleration and 1' for deceleration used to be taken.
- Presently, we follow a graded scale depending on :
 - Speed of the train,
 - Load,
 - Type of station,
 - Type of locomotive,
 - Type of coaches.
- Generally, the first 3 factors are taken into consideration.



Time Tabling of Trains



- Speed of the train (18 coaches) :

<u>Speed in kmph</u>	<u>Acceleration</u>	<u>Deceleration</u>
< 75	1'	1'
75 < 100	2'	1'
> 100	3'	2'



Time Tabling of Trains



- Speed of the train (18 coaches) :

<u>Speed in kmph</u>	<u>Acceleration</u>	<u>Deceleration</u>
< 75	1'	1'
75 < 100	2'	1'
> 100	3'	2'

- Load of the train (90 kmph)

<u>Load in coaches</u>	<u>Acceleration</u>	<u>Deceleration</u>
≤ 18	2'	1'
≤ 18	3'	1'



Time Tabling of Trains



- Type of station (18 coaches, 90 kmph.) :

<u>Type of station</u>	<u>Acceleration</u>	<u>Deceleration</u>
Road side	1'	1'
Intermediate	2'	1'
Major junction	3'	2'



Time Tabling of Trains



- Type of station (18 coaches, 90 kmph.) :

<u>Type of station</u>	<u>Acceleration</u>	<u>Deceleration</u>
Road side	1'	1'
Intermediate	2'	1'
Major junction	3'	2'

- For combination of any of the above, namely speed, load and type of station, $\frac{1}{2}$ minute extra should be added for every 1' extra shown under each category.



Time Tabling of Trains



- ER time should be 10% of the bare running time or 8.7% of the total running time, rounded off to the nearest minute.
- To be provided as follows :
 - This should be around 6' – 10'/100 kms.*
 - Usually evenly spread out over the entire section, both for single line and double line.
 - Last leg having 25% more than other sub – sections.
 - Should be provided in smaller block section so that line capacity is not adversely affected while plotting the master chart.



Time Tabling of Trains



- Suppose there are 4 sub – sections of a 400 km. section.
 - ER time comes to 40’.
 - Sub – section wise distribution would be 9’ for first 3 and 12’ for last section.
 - Balancing can be done from one section to the other.*



Time Tabling of Trains



- TR time is provided in order to adjust for loss of time on account of unscheduled crossings and precedences.
- TR time should be 5% of bare running time 4.8% of the total running time rounded off to the nearest minute.
- On double line sections :
 - this should be around 3'/100 kms.
 - evenly spread out over the entire section,
 - last leg having 25% more than other sub – sections.



Time Tabling of Trains



- On single line sections :
 - this should be around 5'/100 kms.
 - last sub – section having 50% TR of entire section,
 - remaining TR time being evenly distributed.



Time Tabling of Trains



- Both ER and TR time should not be provided in the same block section.
- ER and TR time should be provided in the smaller block sections.*



Time Tabling of Trains



- Platform berthing at intermediate stations sometime becomes a problem in case vacant slots are not available.*
- In that case ER/TR time is adjusted on either side of the intermediate station,
 - for this train, and
 - for other trains that are clashing with it.



Time Tabling of Trains



- Platform berthing at intermediate stations sometime becomes a problem in case vacant slots are not available.*
- In that case ER/TR time is adjusted on either side of the intermediate station,
 - for this train, and
 - for other trains that are clashing with it.
- Minor adjustment of up to 5' can be made in this manner.



Time Tabling of Trains



- Crossings and precedence have to be so adjusted that the more important train goes through.
- At the same time the less important train should not suffer excessive detention.
- Operating time after a crossing depends on the system of working :
 - Token system,
 - Tokenless system, or even
 - Automatic signalling system.



Time Tabling of Trains



- Crossings and precedence have to be so adjusted that the more important train goes through.
- At the same time the less important train should not suffer excessive detention.
- Operating time after a crossing depends on the system of working :
 - Token system,
 - Tokenless system, or even
 - Automatic signalling system.
- Sometimes fine tuning of crossings and precedence becomes a problem when it is observed that the less important train would suffer excessive detention.*



Time Tabling of Trains



- Extra time has to be provided for attaching/detaching of slip coaches, if any.
- The quantum of time would depend on :
 - whether shunting is by train engine or not,
 - whether coaches are to be attached or detached,
 - number of coaches,
 - position of coaches,
 - whether inside SLR or outside the SLR.



Time Tabling of Trains



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- The quantum of time would depend on :
 - whether shunting is by train engine or not,
 - whether coaches are to be attached or detached,
 - number of coaches,
 - position of coaches,
 - whether inside SLR or outside the SLR.
- For traction changing normally 30' time is provided for.



Time Tabling of Trains



- Stoppages at stations should be of 2', 5', 10' or 15' duration.
- Stoppages at road side stations should invariably be 2'.
- Stoppages at intermediate junction stations should be 5'.
- Stoppages at major junction stations should be of 10' or 15' depending on the type of requirement.



Time Tabling of Trains



- A study was conducted in 1992, to calculate the cost of stoppage of a train :
 - running with 22 coaches,
 - at 100 kmph.,
 - on a gradient of 1 : 500,
 - worked by WDM₂ loco.



Time Tabling of Trains



- A study was conducted in 1991, to calculate the cost of stoppage of a train :
 - running with 22 coaches,
 - at 100 kmph.,
 - on a gradient of 1 : 500,
 - worked by WDM₂ loco.
- On account of extra fuel consumed, wages and braking, the cost came to Rs. 750/- for a 2 minutes halt.
- Costs have escalated by > 5 times since then.
- Present day cost for stopping a train in both Up and Dn directions daily comes to Rs 30 lakhs per annum.



Time Tabling of Trains



- However, this calculation does not include :
 - costs of wastage of line capacity,
 - opportunity cost of deceleration of the train,
 - invisible and indirect costs of inconvenience caused to through passengers by poorer punctuality, and
 - aggravated overcrowding which does reflect in reduced earnings.



Time Tabling of Trains



- In principle IR should at least recover the bare cost of providing a 2 minutes halt of a 22 coach train for every stoppage provided.
- Even without taking the invisible costs including the inconveniences caused to a long distance passenger, etc.
- This cost can be recovered for each such stoppage only if
 - a minimum of 30 passengers of mixed class entrain,
 - travel for a minimum distance of 500 kms.,
 - per trip,
 - in each direction.**



Time Tabling of Trains



- Following additional criteria may be borne in mind before consideration of any stoppage :
 - No stoppages should be provided when trains are passing at odd hours,
 - No additional stoppages should be provided to long distance trains in the suburban section,
 - No additional stoppage should be provided in sections having line capacity utilization above 90%.



Time Tabling of Trains



- Name of the Station.
- Train no. whose stoppage is demanded.
- Running between stations :
 - From.
 - To.
- Time of passage of the train at the Station :
 - UP.
 - DN.
- Average run of train between 2 stoppages.
- Distance of stoppages on either side.



Time Tabling of Trains



- Length of train.
- Platform length and availability.
- Stoppage last provided at this station & date.
- Sale of tickets after this stoppage.
- Last stoppage provided to this train & date.
- Other trains stopping for same destination.
- Total number of trains stopping
 - Mail/Expresses :
 - UP.
 - DN.



Time Tabling of Trains



- Passenger trains :
 - UP.
 - DN.
- Number of passengers & earning of last 6 months.
- Number of passengers per day.
- Number of passengers per stoppage.
- Earning per day.
- Earning per stoppage.
- Minimum earning required.
- Commercial justification.



Time Tabling of Trains



- Whether train will be decelerated or not, and
– by how much.
- Effect on punctuality of other trains.
- Line capacity utilization of the section.
- With maintenance block of 2 hrs. (should be $< 90\%$)
- Divisions recommendations.



Time Tabling of Trains



- Running of suburban services is different from that of running other types of services.
- Time tabling of suburban services does not follow the same logic as for other long distance trains.
- All EMU, MEMU, DMU rakes are maintained in their Car sheds.
- Hence, availability of washing lines, stabling lines etc. are no consideration at all.
- Suburban services are constrained by 3 factors :
 - platform,
 - coaches,
 - path.



Time Tabling of Trains



- To some extent platform constraints can be got over with by :
 - Running these EMU rakes in a closed link, so that
 - each train after arrival at the platform is again run out as a new train.
 - Specific platforms are exclusively nominated for suburban trains during peak hours,
 - with directional movement.
 - This ensures that platform occupation does not exceed 10' for each train.



Time Tabling of Trains



- The 2nd constraint of suburban services is non – availability of coaches.
- There is always heavy demand for these coaches.
- Since these are specialised coaches, they are always in short supply,
 - as compared to the demand.
- Maximum utilisation can only be achieved by working them to an optimum rake link.
- However, in this case also, there are limitations.
- Normally any one rake can at most undertake 2 incoming trips during the peak period.



Time Tabling of Trains



- Path problem is the 3rd limiting factor that has now reached almost saturation levels.
- Additional paths can be extracted to some extent by reducing the speed differential between successive trains.
- This can be done by bunching together stopping and non – stopping trains.
- However, the problem is that majority of commuters want to arrive in between 9/– hrs. and 9/30 hrs. only.
- And there is a limit to the number of paths that can be squeezed out during this $\frac{1}{2}$ hour time slot.
- Thus even if more coaches are available some time in the future, it may not be possible to run additional trains.



Time Tabling of Trains



- Long term solution is to go in for longer rakes.
 - From 9 car rakes, we have gone on to 12 car rakes.
 - Trials with 15 car rakes have also been conducted.
 - Ultimately IR should aim at running 24 car rakes.
 - That will augment our existing carrying capacity by more than 100%.*



Time Tabling of Trains



- Standardization of coaching rakes was done with the objective of having standard compositions for different group of trains based at a particular maintenance depot.
- It was expected that with standardization there would be substantial advantages.
- These include :
 - flexibility of terminal operations by way of switching of passenger rakes on a first – in, first – out basis,
 - substantially reduce cancellation of trains or putting back of trains due to late running or dislocations,
 - provision of an overlapping rake at such terminals would ensure right time starts to all trains.



Time Tabling of Trains



- At certain locations where a number of rakes are based for primary maintenance, standardization has proved to be extremely beneficial.
- Difficulties faced in complete implementation of this concept :
 - At secondary terminals switching of rakes posed practical problems involving staff, catering and maintenance.*
 - At primary maintenance terminals, trains going to separate destinations have different requirement of AC and non – AC coaches.*



Time Tabling of Trains



- Practically it is better to have integrated rake links rather than go in for standardization.*
- This can solve many of the problems related to staff, catering, maintenance etc.



Time Tabling of Trains



- Running of passenger trains is slightly different from that of running other types of services.
- All passenger trains run on an integrated rake link where one single rake may work upto 12 pairs of trains,
 - before it gets maintained at one of the terminals.
- Present instructions are that a rake must get maintained once every 3500 kms.
- Main objective is to come up with rake links where maximum utilisation can be achieved.
- Since these are comparatively slow moving trains, paths and terminal facilities do not play a significant role in planning for passenger trains.



Time Tabling of Trains



- Passenger services are generally restricted by only 2 constraints.
 - availability of coaches,
 - availability of locos.
- Passenger services are a losing proposition for IR.
- Conscious efforts are therefore made to restrict the number of such services to the bare minimum.



Time Tabling of Trains



- It is necessary to make a significant improvement in the running of these services :
 - in order to improve overall operations of IR,
 - provide better quality of service to passengers, and
 - improve IR's overall image.
- During last couple of years, certain technically superior services have been introduced in certain selected sections by way of replacement of existing passenger services.
- These include :
 - MEMUs,
 - DMUs.



Time Tabling of Trains



- For branch line sections having very low traffic, rail bus is the ideal solution.
- It is exactly what its name means – a rail bus.
- 70 seater with a driving cab at either end.*
- Provides fast and frequent service on dead ended sections.
- Full train load of passengers may not be available at one time, but at short intervals,
 - a bus load of passengers are available.
- In operation between Merta Road and Merta City,
 - 15 kms. dead end section,
 - 12 round trips.



Review



- Power Plan.
- Loco links & Crew requirement.
- Time Tabling of Trains.



Power Plan, Loco Links & Time Tabling



*Any
questions
please ?*





Thank You





MAKING OF POWER PLAN LOCO LINKS & TIME TABLING OF TRAINS

by :

INDRA GHOSH
COM/NR

Tele : +91 – 11 – 2338 – 7976
Mobile : +91 – 97176 – 30900
E – Mail : com@nr.railnet.gov.in





Power Plan



- First Line.
- AAA.
- BBB.
- CCC.
- DDD.
- EEE.
- FFF.
- GGG.
- HHH.
- III.
- JJJ.
- Last Line.