

BIM Minutes – Held at DLW on 22-23 August 2014

Following officers were Present:-

Railway	Officers attended
Railway Board	AM/ME, EDME/Tr.
DLW	CME, COS, CMM/Engine, CMM/Loco, CMM/HQ, CDE, CME/P, CME/Plant, CQAM, CME/M, Secy to GM, Dy.CME/Spares, Dy.CEE/MC, Dy.CME/MC, Dy.CME/Loco, Dy.CME/Engine, Dy.CME/Block, Dy.CME/Plg., Dy.CME/Tooling, Dy.CQAM-I, Dy.CQAM-II, Dy.CDE/Eng., Dy.CDE/Veh., Dy.CDE/EM, Dy.CDE/TC, Dy.CPM/Veh., Dy.CME/RVNL, Dy.CME/ERP, Dy.CMM/HQ, Dy.CMM/Loco, Dy.CMM/Engine, Dy.CMM/Imp.I, Dy.CMM/Imp.II, MC
RDSO	ED/MP, Director/MP, Director/MP, Director/MP, Director/MP, Jt.Director/MP
Central Railway	CMPE/DSL, Dy.CMM/DSL, Sr.DME/D – Pune & Kalyan
Northern Railway	CMPE/DSL, Dy.CMM/DSL, Sr.DME/D – TKD & AMC
N.F.Railway	CMPE/DSL, Sr.DME/D/SGUJ, SMM/D/SGUJ
N.W.Railway	CMPE/DSL, Sr.DME/D/BGKT, Sr.DMM/BGKT
Southern Railway	CMPE/DSL, Sr.DME/D/GOC, AMM/HQ
S.C.Railway	CMPE/DSL, Dy.CMM/DSL, Sr.DME/D/GY
SEC Railway	CMPE/DSL, CMM/M&S, Sr.DME/D/Raipur
S.W.Railway	CMPE/DSL, Dy.CMM/MP, Sr.DME/UBL
Western Railway	CMPE/DSL, SMM/DSL/SBI
W.C.Railway	CMPE/DSL, Sr.DME/D/ET, SMM/DSL
N.E.Railway	CMPE/DSL, Dy.CMM/DSL, Sr.DME/D//IZN, SMM/IZN
Eastern Railway	CMPE/DSL, Dy.CMM/DSL, DME/D/UDL
S.E.Railway	CMPE/DSL, Sr.DME/D/BNDM, AMM/BNDM
E.C.Railway	Dy.CME/DSL, Dy.CMM/DSL, DME/D/PTRU
ECoRailway	CMPE/DSL, Dy.CMM-II, Sr.DME/D/VSKP
N.C.Railway	CMPE/DSL, Sr.DME/D/Jhansi, SMM/Sales

Meeting was chaired by AM ME/Rly Bd.

CME/M welcomed all the participants and requested Senior officers and Rly Bd. to address the gathering. The relevant issues highlighted by them are as below:

COS

- Supply of item – all backlog of 192 items upto financial year 2012-13 has been completed.
- Total value of material supplied about 214 crores.
- In current year Ist 4 months 60 crores of material has been given – 84 nos material supplied 100% & 20 nos. > 75%.
- Initial spares 22 of 64 items has been supplied 100% and rest planned to be completed this year.
- Drastic change in demand should be avoided. Railways should regularly review requirement not only before submitting indents but also upto coverage of demand i.e. upto placement of PO so that any major fluctuation may be taken care.

CME

- BIM is a forum for discussion on material and also problems with locos and other technical issues.
- Rlys. should take over some procurement instead of putting all load on DLW. Should stand on own legs rather than depending on DLW.
- Wheels – should be made by ZRs and should not be asked from DLW.
- Indigenization – Feed back / Information on trial items be more accurate and regular failures should be promptly reported.
- After 2 months Power packs can be spared for Zonal Rlys.

EDME/Traction

- Material procurement still not getting streamlined in ZRs. Procurement of Import items except in 1 or 2 ZRs has not yet picked up. Rlys. need to gear up their systems.
- Board policy – For Rlys. holding locos < 100, Imported items may be bulked at DLW. However, supply can be expected only after minimum 2 years which is the normal lead time for DLW. Railways should also gear up simultaneously.
- Reliability on coaching services, Punctuality loss cases – adverse comments on high no. of diesel loco failures. Reliability to be improved by taking corrective action.
- 30 days schedule – Railways to continue efforts to develop DLSCs , M/s HPCL & BPCL are also approved for Crankcase oil & tie up with these firms be also explored.
- M&P Program – Very few proposals for diesel items are received. Rlys should process for items like huck bolting, Crab nut torquing, electrically operated torque wrenches etc.
- GOC shop has to develop POH facilities of HHP. DLW to assist GOC shops with material. GOC repaired 2 damaged PPs – WR to give feedback.
- GOC should sent proposal for Test Bed for HHP engines.
- Railways should stick to target of vetted BIM demand by 30th June to DLW. Demands should be critically reviewed so that actual requirement is projected.
- Wheel are distributed by Board through WTA, Railway should develop their own facilities and not depend on DLW.
- CMPEs – Different Systems has been sent up on locos to improve crew comfort, fuel efficiency etc. Pl ensure systems are monitored are working properly with adequate maintenance.
- Complemented DLW for streamlining Bulk Indent procurement.
- Provision of Initial Spares for every sheds should now be expedited.
- WDG5 – Manufacture this year – 9 locos – Railways should ready themselves.
- Important development items in diesel locos are – Distributed Power 6000 HP, Fuel cell, APU for HHP, EFI, Radial truck, Fitting of Air Conditioner and Water Closet
- Marketing should develop 16T Axle load – 3000 HP – MG – High speed engines & also 12 Cyl. EMD engines with 3000 / 3300 HP capacity.
- Rate contract for Overhauling of TM & CCB & Compressor spares entrusted to DLW should be expedited.
- RDSO – Crack in Fab II bogies, Trg. Of design personnel at RDSO is essential.
- Supply of modified bogies for Zonal Rlys. to be expedited.
- Good development items are Common Rail technology. One ALCO loco turned out from Maula Ali. SCR to keep a close watch - 4% improvement in fuel efficiency has been reported in preliminary studies.
- RDSO to take up Common Rail & Miller Cycle technologies.
- CRS sanction G4D & G5 to be expedited by RDSO.

- Sale of over aged locos - Board policy modified and issued. Safeguard have been put in the policy. Railways to explore with various agencies.

AM/ME

- Complimented DLW on Steady improvement in supply of material to Rly.
- However, Rlys. should eventually learn to stand on their own feet.
- Policy for hand holding, for Rlys. with very few locos by DLW for a couple of years, is under consideration in Board.
- Reliability – Locos must perform. Rlys. should ensure close monitoring and better reliability.
- Policy issues requiring Board's intervention – to be highlighted by Zonal Rlys.

BIM Agenda

Timely receipt of indents, sent by Zonal railways, at DLW, Supply performance by DLW for previous years and current year for BIM and RSP and position of pending indents against BIM and tooling were discussed.

Issues raised by Zonal Rlys.

- All Railways requested DLW to expedite supply of Initial spares and Toolings.

WR

- Requested for 3 PPs
- Informed that Draft gear of Goods locos are surplus at SBI

SR

- 5 Oil Pans for OH of Power Pack at GOC shops,
- 5 loco set gaskets for GOC shop - SR asked to send additional indents
- One PP as Unit exchange for GOC
- RSP allotment of 1 TSC.

SECR

- Asked for 1 PP from DLW as Unit exchange spare; and
- Help from DLW for Tooling item outside the list of 68 items currently procured by DLW.

ECR

- Indents of 14-15 sent late be considered
- In July – ECC2 burnt (EMD) case – To be investigated
- Requested for Turbo clutch assly.
- Required joint Checking for locos sent from DLW – DLW mentioned that Dead locos will now be only handed over to Shed representative.

WCR

- Year 13-14 some items still pending – to be reconciled with Spares Cell.
- Water accumulation cases in ECC 2 – Not attended by firm.

ECoR

- TMs required under RSP

NER

- Requested for Huck bolting machine
- Suggested that Crab bolt machine to be included in DLW's list of BIM items and toolings.
- Informed that DMW/PTA – HHP Alternator – Burnt in Ist trip

- Informed about Turbo failure – EMD impeller failed

ER

- Loco No. 12832 – Block cracked
- ECC2 – water accumulation – Medha
- Fuel pump motor – EMD not signing joint note

SWR

- Serviceable Lube oil pump and water pump are available, Cyl Heads lying surplus in Hubli.
- Anomalies in AC-AC Traction system of EMD & Medha not yet rectified. - RDSO to investigate.
- Expressed concern about Fuel pump failures. Requested for replacement.
- Reference HP and feedback HP not matching – Firms to attend.
- 4th Notch Medha – DC link 100V – to be checked.

SC

- Unit exchange spares required for KZP – PP, TMs & MTAs
- 12B – 12J of KPC defective pinion list not given – pinion of 2011 make are also defective.
- Kaysons Master controller – failure of R1, R2, R3 series are taking place. This has safety implications also. Required to be thoroughly investigated. Other railways also corroborated the same. - RDSO to investigate

SER

- RSP – Unit exchange spares required
- Knorr Bremse – No support for CCB

NFR

- PP & TM required
- Cables, Camshaft gear, After cooler cores are surplus.
- Cab shower test to be made more vigorous since leakage in Cab are observed during rains.
- Quality of seals and gaskets – to be checked
- PP OH / repair – PPs to be sent to SR
- Out of 192 items – 80 items can be deleted for which NFR has given Nil indent.

CR

- DLSC – Manpower requirement - Yardstick requested from Rly. Board
- H type coupler – if difference in height is more than 50 mm LHB coach coupling is not taking place.
- IGBT – Quoted in \$ - Required in Rs. – AMC of AC/Ac Traction system
- WDG4D – Fab II bogie strengthening required. Firm to be called for rectification at shed.
- Funds under demand 5 & 8 required. To be referred to Board.

NWR

- 16 locos bogie cracked – Replacement required
- 11 locos has been put back in service.
- Funds – Required under revenue – Reference to be sent to Board.
- MTAs – Required for pooling / 6 TMs also required.
- Interface module : Requested DLW to procure. - DLW to reconsider request.
- Initial spares – Abu Road to be included.

NR:

- Asked for supply of MTA, Bogie frame, ALCO block, TMs, Fuel Pump motors and Injectors – 2 loco set

Misc.

- Committee of Sr.DMEs for identifying 926 item for stocking has been a commendable job. Rlys to expedite stocking and give feed back.
- Committee consisting of Sr.DME/GGKT and Dy.CME/Tooling/DLW as convener to discuss requirement of tooling for ZRs sheds maintenance and review procurement needs and bulking at DLW. Report to be submitted in 2 months from date of issue of minutes.
- Tooling Catalogue to be given to ZRs
- Shop to reconcile position of TSC and Turbo clutch overhaul with sheds.
- TSC – Lube oil jumper bolts are breaking – to be investigated
- Deletion of item – Feedback to be given by ZRs to ED/MP/Rly. Board & who will inform DLW
- DLW website – Part vendor list – Piecemeal uploading of CVD to be avoided.
- CPM 401, 502 – issue for GTO based locos to be resolved with M/s EMD – DLW to coordinate.
- VCD - Time modification not yet done by M/s EMD – RDSO to intervene.

Warranty Related agenda

Following warranty related issues were discussed.

- i) Total 1926 warranty cases have been lodged by different HHP loco sheds since 1st Sep'2013 to 20th Aug'2014. Out of these, 1604 cases have been settled and rest 322 case are pending on various firms.
- ii) Cost has been deducted from vendor's bill for 580 warranty cases pending on various vendors against failure at Zonal Railways. The material for such warranty cases will be spared from DLW subject to availability of stock. Non stock item for cost deduction item will be procured by DLW
- iii) The maximum number of warranty (i.e. 404 cases) is lodged for AC-AC System in which the contribution of M/s EMD is maximum.
- iv) The following supports are required from Zonal Railways.
 - A representative from each shed must report to SIG Cell in the 1st ten days of every month for reconciliation of warranty cases.
 - All sheds are requested to upload new goods locomotives numbers in FOIS at the time of dispatch advised by DLW and monitor its movement on FOIS during its maiden journey to avoid misroute and delay.
 - DLW requires a feedback from all concerned sheds regarding cause of en-route failure along with commissioning reports in new locomotives within 10 days.
- v) Soft copy of loco document is to be sent to concerned CMPEs/Dsl and Sr.DME/Dsl.
- vi) Various shed's representative reported that closing of warranty case is not being done on the portal of DLW. This is to be started.

Technical agenda:

1. Failure of indigenous radiators

Agenda - Poor reliability of HHP radiators manufactured and supplied by indigenous vendors has been a cause of concern. The issue was discussed during the 43rd DMG held at Chennai in Jan' 2014. Failure analysis received from SC Rly indicates that the failure rate continues to be high in the current year also.

Zonal railways may give feedback. RDSO may elaborate upon the corrective action taken by indigenous approved sources for improving the reliability of MBRs.

Deliberations: A presentation was made by DLW. Details of process audit done by DLW with regard to application of radiator assemblies on HHP locomotives (including precautions to be taken during storage, handling, assembly & mounting) and compliance to the instructions published by EMD (OEM) in their documents (EDPS & MI) in this regard were presented to the forum.

The details of modifications done by indigenous vendors in side channel, tie rod, expansion joint, dummyming of end tubes etc., were also discussed. Feedback from some zonal railways (BGKT, PA, SBI & GOC sheds) indicates that the performance of modified radiators has shown improvement. However, the performance needs to be further monitored.

Based on above discussions, it was decided that :

- (a) DLW will issue detailed instructions indicating placement of rubber shim during mounting of radiator assemblies on the cooling hood.
- (b) Sheds to ensure that the quality of coolant is maintained to the specified standards
- (c) Sheds to ensure that proper lifting tackle is used for handling of radiator assemblies. DLW to provide drawings of the lifting fixture to Zonal railways
- (d) Performance of indigenous make modified design radiator assemblies to be monitored and feedback to be given to RDSO and DLW

2. Performance of Turbo clutch and its system of overhaul

Agenda: Presently the sheds are following the maintenance instructions issued by RDSO wherein the clutch drive assembly is to be overhauled in 3 yearly schedule. In this regard, DLW had conducted a workshop on "Failure of clutch drive assembly" in December-2013. It was attended by officers and supervisors of various HHP sheds. Subsequently, a Design Bulletin No. DB/01/2014/21 containing instructions to be followed for checking functional health of the clutch drive assembly on the locomotive was issued in Jan-2014.

Zonal railways may give feedback on recent failure trend of clutches (failing within 3 years) and also implementation of the process defined for testing of clutch drive assembly in the Design Bulletin.

Deliberations: Details of improved design Clutch assembly were presented by DLW. Zonal railways indicated that the average life of clutch assemblies is coming between 2.5 to 3 years.

Based on above discussions, it was decided that :

- (a) DLW will procure 50 sets of new design clutch assemblies and distribute them to Zonal railways as per following distribution:

25 nos. to GY shed,	10 nos. to SBI
10 nos. to DLW	5 nos. to UBL

- (b) Performance of modified design Clutch assemblies to be monitored and feedback to be given to DLW
- (c) The present capacity of DLW to overhaul clutch assemblies is 300 per year. This would not be sufficient and has to be enhanced to 600 per year within the next 2 years.

3. Overhaul of traction motors

Agenda: Rly Board has directed (L.No. 2014/M(L)/466/1(4) Dated 16/07/2014) DLW to finalize rate contract for 6 yearly overhaul of HHP traction motors for operation by Zonal railways. DLW has initiated the process and has requested RDSO to provide STR for overhauling of 3-phase traction motors of HHP locomotives.

RDSO had uploaded the schedule of technical requirements for repair/overhaul/rehabilitation of 3-phase traction motors of broad gauge Diesel Electric HHP locomotives on 18/06/14 on their website for comments.

RDSO is requested to update and provide current status regarding issue of specification for 6 yearly overhaul of traction motors of HHP locomotives

Deliberations: Overhauling of AC traction motors shall be done by OEMs. In this regard DLW shall finalize a rate contract . Scope of the RC shall be based upon the past experience of zonal Railways who have under taken this activity earlier. To encourage cost competitiveness among OEMs (part I approved suppliers of RDSO), one OEM may undertake the overhauling work of other OEM make motors subject to the condition that:

1) The overhauling work done along with the materials/ spares used therein shall be covered by warranty of 24 months, 30 months from the date of fitment or dispatch respectively, whichever is earlier.

Based on above discussions, it was decided that:

- (a) Railway units should develop facilities and expertise for taking up overhaul of traction motors
- (b) Railway should advise details & number of Traction Motors becoming due/overdue for 6 yearly overhaul to DLW

4. Overhaul of CCB

Agenda: Railway Board has directed DLW to finalize rate contract for 6 yearly overhaul of Computer controlled brake system. DLW has examined and finalized the technical inputs required in the form of spares/ overhauling kits for 6 yearly overhaul of CCB-1.5 systems. Yearly arising for 6 yearly overhaul in the next 4 years will be 418 locos (2014 – 72 nos., 2015-115 nos., 2016-121 nos., 2017-110 nos.). Nineteen overhaul kits will be needed per system and approx. cost of kits per system is around Rs. 3.80 lakhs. Proposal for finalizing an overhauling contract with the OEM has been initiated. Meanwhile, process has also been initiated to finalize a rate contract for 95 items which may be required as spares for replacement in CCB-1.5 systems.

Zonal railways may like to discuss

Deliberations: CMPE(D)/NF Rly & Sr.DME(D)/SWR stated that they have executed overhaul contracts for CCB-1.5 in the past.

Based on above discussions, it was decided that :

- (a) DLW should expedite finalization of rate contract for 6 yearly overhaul of CCB-1.5 with the OEM M/s. Knorr Bremse.

5. Policy for maintenance of air conditioners

Agenda: DLW has turned out 17 HHP locomotives fitted with HVAC units. A total of 29 HVAC units have been fitted by DLW so far. The locos have been dispatched to various diesel sheds. The population of HVAC units in service on HHP locos is going to increase in future.

Zonal railways may give their opinion on maintenance policy to be followed for these HVAC units

Deliberations: Zonal railways have to ensure that various design improvements done by DLW for improving crew comfort, safety etc. are properly maintained. Their proper utilization should be ensured and tendency of disabling the features in the event of their becoming defective should be avoided.

Based on above discussions, it was decided that :

- (a) DLW should ensure that AMC clause is included in the purchase orders issued by DLW for procurement of HVAC units.
- (b) Zonal railways should ensure proper working of air-conditioners and regular performance feedback should be given to DLW for taking any action with regard to reliability improvement etc.

6. Implementation of REMMLOT

Agenda: DLW has placed a developmental order on M/s Medha for supply of 100 Loco sets of Driver Control Desk with TFT and **REMMLOT** out of which 85 nos. have been fitted on ALCO locomotives by the Zonal railways and 15 have been fitted by DLW (09 in HHP + 06 in ALCO). The detail of fitment on ALCO locos by Zonal railways is as under:

SN	SHED	Qty.(in Sets)
1	ECoR/VSKP	15
2	SWR/KJM	8
3	WCR/NKJ	10
4	SWR/UBL	7
5	NR/AMV	10
6	WR/VTA	5
7	WR/RTM	5
8	SCR/GY	10
9	SCR/KZJ	5
10	ER/HWH	5
11	ER/JMP	5

Since RDSO is involved in further development of REMMLOT for HHP locos with AC-AC traction system vendors, the latest status on development and progress made in this area may be shared.

Deliberations: Advantages of REMMLOT were discussed. Currently, this feature is available with Medha and Siemens (4 nos. fitted for field trial) system. Matter needs to be taken up with EMD for providing their system with REMMLOT feature. The information being captured by REMMLOT is huge. Useful report containing only critical data/parameters needs to be generated for analysis by railways.

Based on above discussions, it was decided that :

- (a) RDSO will take up the issue of provision of REMMLOT feature with EMD and Siemens
- (b) RDSO will advise the cut-in date to DLW for fitment of REMMLOT on HHP locomotives
- (c) A committee consisting of Sr.DME(D)/VSKP, Sr.DME(D)/GY, Sr.DME(D)/GD and Director (MP)/EC/RDSO was earlier constituted to finalize data and format for the parameters captured by REMMLOT for a meaningful analysis. The committee should submit its final report in two months time.

7. Failure of HHP fuel tanks

Agenda: Failure in HHP fuel tanks were reported in the past by Zonal railways. Main cause of failure was leakage from the bottom single flare V- Groove joint. DLW conducted a comprehensive design and manufacturing process audit and subsequently a Design Bulletin No. DB/02/2012/6 giving details of improvements done in design and manufacturing process was issued on 23/07/2012. Copies were circulated to all CMPE(D)s and is also available on DLW website.

Modified Fuel tanks with improved quality of welding has been fitted by DLW from Loco no. WDG4-12774 & WDP4D-40111 onwards. The HHP locos fitted with improved design fuel tank have been dispatched by DLW from April-2013 onwards. Also, a fuel tank design suggested by RDSO has been introduced in WDG4D locos and their performance will be monitored. RDSO has issued an Instruction Bulletin No. MP.IB.LD.01.01.14 Rev.00 dated 03.01.2014 for repairing of cracked fuel tank.

Zonal railways to give feedback on HHP loco fuel tank failures on locos commissioned after June-2013.

Deliberations: Failure feedback received from Zonal railways indicates that the failures in improved design fuel tanks fitted by DLW on locomotives dispatched after June-2013 have reduced substantially. SCR, WCR, SER, WR, ECR, ER, NFR and CR have reported NIL failures in the improved design fuel tanks. Only one failure has been reported by NER. The difference in the HHP fuel tank designs being used in WDG4 and WDP4D locomotives and that being used in WDG4D locomotives was discussed.

Based on above discussions, it was decided that:

- (a) Fuel tank reliability issue on HHP locos has been resolved and implementation of the manufacturing process modification done by DLW need to be ensured in all future supplies.
- (b) DLW to ensure that supply of spare fuel tanks to Zonal railways as agreed to in the earlier HHP BIM, as replacement for suspect fuel tanks in HHP locomotives in service, be made at the earliest.

8. Failure of Fuel transfer pump

Agenda: Zonal railways have been reporting of failures of fuel pumps on HHP locomotives. Failures were investigated by DLW and based on the findings a Design Bulletin No. DB/02/2013/01 dated 26.02.2013 was issued by DLW. Copies of Design Bulletin were circulated to all CMPE(D)s and is also available on DLW website.

DLW has since then relocated the fuel pump. It has been shifted to a location under the bottom plate of the centre-sill. This has resulted in improved suction head and reduction in Fuel pump temperature by almost 10 degree C. The list of WDG4 and WDP4D locos turned out by DLW with underslung fuel pumps was circulated to all CMPE(D)s vide letter No. dlw.m.65.211.3 dated 07.01.2014. Loco nos. starting from WDG4 12803 & WDP4D 40122

onwards are having fuel pump mounted under the platform. WDG4 12803 was dispatched to SGUJ shed on 26.06.2013 & WDP4D 40122 was dispatched to TKD on 13.07.2013.

Zonal railways to give feedback on fuel pump failures on HHP locos commissioned after June/July 2013.

Deliberations: Feedback received from Zonal railways indicate that the performance of relocated fuel pumps has improved. WCR, SER, NER, NFR and NWR have reported NIL failures in relocated pumps while SCR, ECR, ER and CR have reported 1 failure each in relocated pumps. DLW has turned out 297 HHP locomotives till date with relocated pumps (since July-2013 onwards).

DLW also presented the details of a higher inverter rating fuel pump available with OEM (M/s. Paragon/USA) with improved features like over-current and over-voltage protection, thermal shut down feature, grit protection etc. Higher over current margins and lower estimated MOSFET temperature increase over fuel temperature are some of the features which improve its reliability over the existing design. The pump is designated as Paragon model no. # 63731-9 (56 frame) and is rated at 7 GPM @ 150 psi.

Based on above discussions, it was decided that :

- (a) DLW will switch-over to higher inverter rating fuel pump design of OEM on all HHP locomotives. (Paragon model no. # 63731-9 (56 frame) rated at 7 GPM @ 150 psi)
- (b) DLW will also advise the details of the improved fuel pump to Zonal railways. Zonal railways can also procure higher inverter rating fuel pump (supplied by OEM, M/s. Paragon/USA) for retro-fitment on existing HHP locomotives.

9. Performance feedback for CCB-2.0 systems

Agenda: 157 HHP locomotives have been turned out by DLW till date with CCB-2 brake systems. The Shedwise population of HHP locomotives fitted with CCB-2 brake system is summarized as under:

Sr.No.	No. of Locos	Shed
1	3	AMV
2	1	ABR
3	6	BGKT
4	8	BNDM
5	7	ET
6	15	GOC
7	10	GY
8	11	IZN
9	6	JHS
10	6	KZJ

Sr.No.	No. of Locos	Shed
11	1	NKJ
12	12	PTRU
13	20	PA
14	14	RAIPUR
15	3	RTM
16	18	SBI
17	4	SGUJ
18	3	UDL
19	9	VSKP

Performance feedback received by RDSO from Zonal railways is enclosed as Annexure-III.

Zonal railways may like to share feedback

Deliberations: Analysis of CCB-2 failures reported by Zonal railways indicate that most of the failures of CCB-2 have occurred because of dry solder and connector related issue. Zonal railways were requested to provide further details of failures to DLW and RDSO for detailed analysis. Zonal railways mentioned that the response of M/s. Knorr Bremse to the call given by

various sheds has not been satisfactory. RDSO should take up the issue with M/s. Knorr Bremse.

Based on above discussions, it was decided that :

- (a) DLW will collect failure details of CCB-2 from various sheds. The data should be analyzed and the results of analysis should be presented to the forum in the upcoming HHP DMG.

10. Expansion Joint (PL No. 16240777 & 16240807)

Agenda:

- a) DLW has switched over to import of Expansion Joints from EMD since 2010. However since there were supply constraints from single source, limited indigenous procurement had been done as a special case in early 2011 to mitigate the supply crisis. Further, to improve reliability of indigenous supplies, these expansion joint assemblies had been procured with modified design. (bellow ply thickness of 0.3mm).

From the feedback collected from railways, following has emerged:

SN	Expansion Joint PL no.	M/s Ranflex		M/s Vikrant	
		Total nos. fitted	Failure reported	Total nos. fitted	Failure reported
1.	16240777	130 nos.	24 nos.	63 nos.	04 nos.
2.	16240807	41 nos.	03 nos.	21 nos.	03 nos.

Railways may like to substantiate this analysis and also share the performance of modified expansion joints procured by sheds/Railways directly.

- b) Mean-while, to improve the supply chain DLW had worked with an international manufacturer (M/s Eagle Burgmann/Denmark) & an indigenous manufacturer (M/s V-Flex Bellows/Vadodara, supplying these Expansion Joints to M/s Kirkland Associates Ltd, USA for after market use on locomotives). The details of supplies made by them is as under:

Firm	Ordered quantity	Supplied & fitted qty.	Remark
M/s Eagle Burgmann/ Denmark	20 loco sets (20 nos. small & 60 nos. big)	20 loco sets	Poor performance. Total 23 nos. (approx 30%) failure reported (Annexure-A)
M/s V-Flex Bellows/ Vadodara	20 loco sets (20 nos. small & 60 nos. big)	20 loco sets	These Expansion joints are as per firm's drgs. Fitment details attached as Annexure-B.
	25 nos. small & 48 nos. big	02 loco sets	These Expansion joints are as per DLW drgs. Fitment details attached as Annexure-B.

Railways may like to discuss the failure of M/s Eagle Burgmann make Expansion joints. Railways may monitor field performance of M/s V-Flex make Expansion joints

Deliberations: Failure data and design differences between OEM's expansion bellow and V-Flex expansion bellow were presented by DLW. Occurrence of failures in PL No. 16240807 (10 inch expansion bellow) was found be more than PL No. 16240777 (14 inch expansion bellow). Zonal railways mentioned that they are procuring expansion bellows from indigenous sources and it would be better if 10 inch expansion bellow is also made a BIM item.

Based on above discussions, it was decided that:

- (a) PL No.16240807 (10 inch expansion bellow) should also be made a BIM item.

11. Water inlet Tube (PL No. 16050253)

Agenda: Large nos. of premature failures of Water Inlet Tube of M/s JBM make had been reported in past. Accordingly vendor status of M/s. JBM was reviewed and M/s JBM had been relegated to Part-II for Inlet Tube. DLW had done technical audit of indigenous supplier (M/s JBM) and re-validated their fabrication/machining fixtures & receiver gauge. M/s JBM has improved their manufacturing process with introduction of Induction Brazing (in place of manual brazing) and introduced finish machining process after brazing in May'2012.

However the railways continue to report failures in current supplies of M/s JBM.

Railways may like to share the performance of Water Inlet Tube of M/s JBM make on locomotives commissioned after June'2012

Deliberations: Quality issue in JBM make water inlet tubes was discussed. CMPE(D)/ NF Rly mentioned that the failure data / statistics indicate that frequency of occurrence of water inlet tube failures was high at power assembly locations 11 to 13. Other railways may also analyze the failure trend with regard to location. Action initiated by DLW for delisting M/s JBM from DLW Composite Vendor Directory for this item is considered justified.

Based on above discussions, it was decided that :

- (a) DLW should go ahead with de-listing of JBM from DLW CVD for this item
- (b) Water inlet tubes should be sourced from OEM. Meanwhile, DLW should make efforts to identify other indigenous sources capable of developing this item to the required quality standards. A developmental tender of substantial quantity may be floated for dev. of indigenous vendors. However, caution should be exercised while proliferating water inlet tubes of indigenous manufacturers.

12. Performance of improved design piston rings:

Agenda: A new ring pack design offered by EMD is being tried out to reduce lubricating oil consumption in HHP locomotives. This has first chrome plated compression ring with barrel shaped face (without grooves). Also, the grooves in the second & third chrome plated compression rings have been eliminated. The sixth oil control ring has also been modified with reduction in ball diameter and changed spring specification. The differences are summarized as under:

Ring No.	Existing/ Old Ring Drg. No.	Existing Ring feature	New/ Improve Drg. No.	New/Improved Ring feature
1	9338809	Chrome plated with grooves	40163747	Chrome plated, face profile changed to barrel face without grooves.

2	40021965	Chrome plated with grooves	40163745	Chrome plated, grooves eliminated.
3	40021965	Chrome plated with grooves	40168545	Chrome plated, grooves eliminated.
4	8347100	No Change	8347100	No Change
5	8347103	No Change	8347103	No Change
6	40032525	-	40168544	Change in profile including slight reduction in ball diameter, changes in spring specification and changes in tightness requirement

RDSO has issued a trial scheme No.MP.TP-49, March-2013 for assembly and monitoring of field trials. Performance of the ring pack has to be evaluated mainly on the basis of:

- LOC in terms of liter/100EKM
- Lube oil to fuel ratio (LFR)
- Cylinder liner wear indicated by spectro-analysis of lube oil also
- Ring wear indicated by side clearance/end gap.

Thirteen HHP Locomotives fitted with new improved design piston rings have gone to NKJ, GOC, SGUJ, IZN, KJM, SBI, RTM, BGKT, ET, UBL & TKD sheds. Loco no. details are enclosed as Annexure-I.

Zonal railways may share their experience regarding performance of new design piston rings

Deliberations: CMPE(D)/NWR mentioned that before proliferating improved design piston rings on HHP locomotives, extensive field trials need to be conducted in locomotives working in dusty terrains. Trials on HHP locos based in NWR and WR are essentially required to establish efficacy of improved design piston rings in reducing lube oil consumption.

Based on above discussions, it was decided that :

- (a) DLW should process for procurement of 150 loco sets of improved design piston rings and distribute 50 sets each to BGKT and SBI sheds. Remaining 50 sets to be held by DLW. An improved sample size will make the performance data more representative and eliminate chances of measurement errors while validating the performance of these improved rings.

13. 13. Headlight failures in HHP locomotives

Agenda: Headlights containing 200 Watt, 30 Volt incandescent lamps are being fitted in front & rear end. Each headlight contains 2 bulbs. The details are as under :

Description	PL. Nos
Headlight Assembly	18360683
Bulb 200 watt, 30 Volts(PAR56)	18360324

SGUJ has reported of failures of Head Light bulb after service of 06 months. The codal life of bulb is 350 hours (as per data sheet of GE). RDSO has investigated the failures and has observed that the voltage drop across HLPR of 8 ohm \pm 10% is contemplated to match 26 V across the bulb.

DLW recommends that the Bulbs be replaced after expiry of their codal life to avoid online failures.

Further DLW has also fitted 350 Watt Halogen in 20 Locomotives for field performance. No resistor is required for Dim/Bright adjustment of this bulb. The bulbs are retro-fittable in same assembly. Switch is however different and requires change. The codal life of these Bulbs is 2000 hours.

Meanwhile, RDSO vide its letter no. SD.Headlight (EMD) dated 05.03.2014 has advised SBI shed for fitment of 8+ 10% ohm Headlight resistor to EMD Part no. 6958079 in 10 HHP locos for trial and furnish feedback. SBI shed is yet fit and conduct trials.

Zonal railways may share their views on this

Deliberations: Zonal railways mentioned that there were not facing any problem with headlight bulbs. DLW presented the details of improved life headlight bulb to the forum.

Based on above discussions, it was decided that :

(a) Zonal railways are comfortable with the existing design Headlight bulbs.

14. Traction Motor speed sensor failures

Agenda: Zonal Railways have reported of speed sensor failures. The matter has been analyzed. It has been observed that most of the cases of TM speed sensor failures have occurred in EMD & Medha Locomotives. DLW's observation are as under :

Medha system: In case of speed sensor failure/wheel lock, loco operated in normal mode even when the speed sensor is disabled through display. If sensor wire is cut, corresponding TCC also stopped working.

EMD system : In case of speed sensor failure/wheel lock, loco operated in normal mode even when the speed sensor is disabled through display. If TM2 sensor wire ground fault is experienced, the locomotive failed.

Siemens system: In these locomotives, sensor enabling and disabling is possible and Locomotive operation is not affected. The logic is same as GTO Locomotives.

RDSO has advised all CMPEs' vide its letter dated 11.07.2014 specifying compatibility of various makes of speed sensors with different AC-AC traction systems.

Zonal Railways are requested to give their feedback and discuss

Deliberations: Cases of locomotive failures due to malfunctioning of speed sensors were discussed. RDSO has advised Zonal railways about compatibility of different makes of speed sensors with AC-AC systems. RDSO is analyzing the cases of failures and will issue an IB on this issue by 15th September.

Based on above discussions, it was decided that :

(a) RDSO will issue an IB on the issue of traction motor speed sensor

15. Performance of Improved Indigenous Thrust pad

Agenda: As per RDSO report No. MP.INV-53 Rev-00 dated June-2012 quality of Pad ASM Lateral Thrust of EMD locomotives of Indigenous make is not yet established. Indigenous manufacturers are M/s Basant/ Rubber/CSTM, M/s Prag Industries/LKO, M/s Manisha/CSTM & M/s GMT/Bangalore.

As per BIM 2015-16 record notes :

- Only imported thrust pad are to be used for passenger application.
- Percentage restriction imposed on indigenous thrust pad should be removed for freight application..
- Considering the encouraging performance in the freight service of Prag & GMT, there is a compelling case to try them out in the more strenuous passenger application especially since there is inadequate data to establish their performance in passenger application. Hence, **ten loco set each of M/s Prag & GMT make thrust pad to be fitted on passenger locomotives by DLW.**
- DLW to create a distinction between the two design (by a minor hole etc.) and stock them separately so that the use of indigenous thrust pad on freight application is proliferated.
- Feedback regarding failure of thrust pad should be sent to RDSO from all Zonal Railways on real time basis, so that proper investigation into failures can be made. This feedback should include imported thrust pads (besides the indigenous make).

DLW has prepared a separate drawing for Pad ASM Lateral Thrust to part no. 17022708 to be used on freight services & further procurement is being done for freight services.

DLW has fitted Prag & GMT make Thrust Pad on WDP4D locomotives. Fitment details till 28.07.2014 has been furnished to Railways by DLW. Failures of thrust pads received from Zonal Railways of different makes are as under-

Make	2010		2011		2012		2013		Total	
	P4	G4	P4	G4	P4	G4	P4	G4	P4	G4
Basant	0	6	68	21	46	15	74	8	188	50
Prag			-	1	0	1	14	1	14	3
GMT			-	-	-	-	-	-	-	-
EMD			-	-	-	-	-	1	-	1

The population of indigenous thrust pads is as follows:

M/s Basant: 6240; M/s Prag: 3069
M/s GMT: 1646 M/s Manisha: 214
(Details of fitment are enclosed as Annexure-II)

Railways are advised to bring the latest performance to take a call on indigenization

Deliberations: Zonal railways emphasized that RDSO should clearly define conditions with regard to usage of bogie suspension items like imported thrust pads, indigenous single coil springs, side bearer pads (secondary rubber springs) etc. to maintain maximum speed

potential of passenger HHP locomotives. It was pointed out by CMPE(D)/NWR that M/s. LORD is not quoting in their tenders issued for procurement of lateral thrust pads. DLW was advised to assist Zonal railways in this regard.

Based on above discussions, it was decided that :

- (a) RDSO will issue a document clearly defining the boundary conditions with regard to use of lateral thrust pads, coil springs, secondary rubber springs etc. for retaining the maximum speed potential of HHP passenger locomotives.
- (b) DLW will arrange to fit 20 loco sets each of indigenously manufactured lateral thrust pads of M/s. Prag & M/s. GMT make in HHP passenger locomotives for trial.

16. Performance of Indigenous Coil springs

IR had earlier tried indigenous springs and due to reliability issues, gone back to imported springs from EMD. Hence DLW is procuring springs from a single source i.e. EMD (Gruber has been recently accorded Pt-II).

Due to the supply chain problems (EMD does not manufacture springs), DLW has provided indigenous springs with RDSO approval and after RDSO prototype clearance on limited number of locomotives. Among these sources Frontier Springs and G.B. Springs has been recently accorded Pt-II by RDSO for both WDG4 and WDP4 coil springs.

Besides Frontier Springs and G.B. Springs, three other sources i.e. RSK/Gwaliar, Abok Springs and B.P. Springs have also supplied WDG4/WDP4 series locomotive springs to DLW. The fitment details are given at Annexure-III.

Till now 03 failures of GB Springs & 02 failures of Abok have been reported by NWR.

Railways are advised to provide the performance feed back of these springs

Deliberations: Issue of identification of single coil springs of P4 series locomotives and G4D was discussed. The identification becomes difficult as there is an overlap in the parameters within the tolerance band for both the type of coil springs. RDSO was requested to make the springs common for P4 series locomotives and G4D locomotives. With regard to the single coil springs supplied by RSK/Sithauli which have gone into HHP locomotives, it was decided that the performance of Sithauli make springs should be monitored for some more time before taking a call on further proliferation of RSK make springs in HHP locomotives. DLW mentioned that 50% of the requirement of single coil springs for WDG4 locos has been covered on RSK/Sithauli.

Based on above discussions, it was decided that:

- (a) RDSO will merge the existing single coil spring drawings of P4 and G4D to make a common design which can be used on both types of locomotives.

17. Failures of Fab-II Bogie Frames of HHP locomotives

Agenda: A total of 36 nos. failures have been reported till date by Zonal Railways. Out of these 36 failed bogie frames, 33 are of M/s Ved make & 3 are of M/s Simplex make. All cracks have been noticed in the WDP4D locomotives & in the middle axle area near to damper bracket of bogie frame.

A meeting was held in AM (ME)'s chambers at Railway Board on 30th June 2014. Following line of action was decided during the meeting-

- RDSO will issue a Mod sheet for strengthening of HTSC fab-II bogie frame for HHP locomotives.
- For repairing of fab-II bogie frames, the sheds should follow repair procedure circulated by ROSO.
- DLW will provide spare tab-II strengthened bogie frames (around 25 bogie frames) to affected sheds for replacement
- Production of WDP4D locomotives with strengthened fab-II bogie frames should continued. Meanwhile, RDSO should design a new improved fabricated bogie frame design in 4 month.

RDSO vide their letter no.SV.WDG4D dt.10.07.2014 has issued following instructions:

- ROSO has issued Mod sheet no. MP.MOD.VL-04.09.14 dated 07.07.14 on modification for strengthening of HTSC fab-II bogie frame for HHP locomotives.
 - Repair of cracked bogies will be carried out by concerned manufacturer, including provision of gusset plates as per ROSO Mod sheet no. MP.MOD.VL-04.09.14 dated 07.07.14.
 - Modification to the good HTSC fab-II bogie frame in service shall be undertaken by the sheds.
- DLW has started strengthening of Fab-II bogie frames as per Mod sheet no. MP.MOD.VL - 04.09.14 dated 07.07.14, A total of 29 nos. Fab-II bogie frames have already been strengthened at DLW till 02.08.2014.

Zonal railways may like to discuss

Deliberations: Zonal railways raised the issue of warranty since the usage of crack repaired bogies was only being permitted on WDG4 locomotives. RDSO clarified that the strengthened fabricated bogies modified as per procedure laid down in RDSO Mod Sheet can be used in WDP4D locomotives. It was confirmed that the strengthening of bogie frames is to be done by vendor. Decision regarding design for further procurement would be decided in a separate meeting to be called in the Board shortly.

Based on above discussions, it was decided that:

- (a) Board/RDSO will issue directions for procurement of bogie frame for WDP4D and WDG4D locos for 2015-16 and onwards.