

Minutes of 3rd Bulk Indent Meeting held at DMW on 20th March 2015

Address by CAO(R)/DMW

CAO(R)/DMW welcomed AM/ME and other officers from Board, RDSO, DLW and Zonal Railways. He stated that this meeting provides not only excellent forum for the supply of Spares of ALCO Locomotives, but also to exchange views on the problems being faced by Zonal Railways related to supply, quality, warranty and other technical aspects. During 2014-15, DMW is going as per original plan for rebuilding 60 locomotives and manufacture of 66 new locomotives. In addition, 15 WDM3D and 10 WDS6 locos are planned for Parel Workshop. These production targets will be met during 2014-15. DMW has also given priority for supply of 550 Motorised Wheel Sets will exceed during the current financial year. This will help in extending the schedule periodicity of ALCO locos on Zonal Railways. Till date, 113 locomotives have been fitted with Auxiliary Power Unit (APU) which shall help in reducing fuel bill of Railways. DMW has also supplied 126 Engine Blocks, 23 Power Pack Assemblies and 11 Bogie Assemblies to Zonal Railways.

Quality Improvement Initiatives taken by DMW during last financial year will continue. Senior officers of DMW regularly visit Diesel Sheds to get first hand feedback on performance. Periodical meeting are also arranged at DMW to sort out quality and warranty issues.

From 2015-16 onwards, DMW will not be manufacturing new locomotives and therefore, the work of rebuilding will be at the level of 110 Locomotives. Railways should ensure that feed of locomotives for rebuilding is adequately maintained.

On green energy front, a solar power plant of 2MW capacity has been sanctioned for DMW under PWP 2015-16. Our proposal for ERP and certain works to improve mobility of trucks have not been sanctioned. However, DMW will be process again during 2016-17. Railway Board may kindly assist to clear our proposal for ERP and certain works to improve mobility of trucks in store department.

Address by Addl. Member (Mech)

AM (ME) stated that BIM is an excellent platform to exchange ideas, latest development in Loco rebuilding. DMW is doing excellent job in making new locomotives. New infrastructure has been added in workshop to further improve the quality standard. Railway Traffic is increasing @ 5% and 50 MT on incremental basis every year. However, Hon'ble Minister of Railways desires to keep the target @ 15% in the year 2015-16. All CMPEs of Zonal Railways are advised to ensure improved availability and reliability of locomotives to achieve this target. The loco outage to be increased and zero failure concept particularly for roller bearings to be introduced as per Member Mechanical's directives.

Zonal Railways are advised to gear up fast and to be ready for rigorous audits of work practices in their sheds. Their Sr. DMEs and CMPEs should personally investigate roller bearing failures. He has also stressed that HHP loco maintenance facilities to be enhanced as nine sheds have been sanctioned and included in pink book for 2015-16. He has also stressed that pending shed extension works to be completed quickly.

DMW is doing lot of good work in various areas. Some of new facilities i.e. Heat Treatment for case carburised Gear, Rotary Gelatine Machine for varnishing of Traction Motor Armature, Testing of Motorized wheel set at 100 kmph., electronic torque wrench etc. have been added.

He stated that demand for WDS6 locos will continue infuture and also advised that de-rated locos not to be run as these are fuel Guzzlers and Zonal Railways to give sufficient feed to DMW for rebuilding of locomotives. Lot of development has been initiated to install APU in locomotives and advise to increase the level of utilisation of APU from existing 40% to higher level. Board is giving lot of thrust on fuel saving features and these modifications must translate into significant fuel saving.

DMW has rolled out 02 Nos. Multigen Set Locos and RDSO should expedite finalization of specification, so that 26 additional Multi Gen Set locos can be manufactured by DMW during 2016-17 & 2017-18.

Minutes of Supply Agenda items

1. Submission of Indents:

Zonal Rlys should submit vetted indents for 2016-17 by 30.09.14. It was pointed out that non submission of timely indents by Zonal Railways delays the procurement cycle and consequently supply of items. Piece-meal indent should not be sent. Only 04 Railways i.e. SR, NFR, WCR and SECR have submitted vetted indents timely and 06 Railways i.e. WR, NWR, SCR, NCR, NR &ER have delayed by 02 months. Late indents were received from 06 Railways i.e. ECR, CR, ECoR, NER, SWR and SER.

AM/ME directed that Railways should positively submit their vetted indents by the target date.

2. Outstanding Dues:

Outstanding dues would be carried forward to the next year regularly as a policy. DMW has already uploaded the latest status of net indents and supplies for 2014-15 (upto 20th March'2015) on DMW website. Zonal Rlys may check status of indents & supply. Railways are advised to provide additional demand, if any, for 2015-16 latest by 15th Apr'15. Railways should make adequate fund provision for catering to carried forward quantities.

3. Compliance of Ann'N', BIM and Carbon Brush items:

DMW has despatched Ann'N' items worth Rs.100 cr.and BIM items worth Rs.172 cr. till 20th March'2015. DMW has met the compliance more than 85% in most of the items. DMW promised to further improve the compliance rate of items such as extension shaft gear, Cam gear, Stiffer Camshaft. (Detailed action plan at **Annex-I**.)

4. Review of demand of High Value items:

The demands of high value items was analysed taking into account 03 years i.e. 2014-15, 2015-16 & 2016-17 average demand per 100 locomotives (or cylinders) holdings of Zonal Railways. There was a wide variation in demands across Railways in reference to average demand.

AM/ME directed that Railways have to assess their requirement meticulously for their maintenance need. Railways should also share information for the Spares lying in excess with them so that these can be used by the Railways to meet their maintenance requirement.

5. Deletion of BIM and Annexure 'N' ITEMS:

Some of the items procured under Annexure 'N' are low value and are indented by only two or three Railways. Besides, some of these items are of MG locomotive or pertaining to the unmodified design. It was proposed to delete these items from the list.

List is attached at **Ann-II**.

DMW should take views of the concerned Railways and submit consolidated report to Railway Board for taking final decision.

6. Addition of Ann'N' & BIM items:

In view of a number of technological upgradations being undertaken in ALCO locomotives, DMW proposed 09 items in 2015-16 and one item i.e. Traction Motor End Fittings kit to be added for procurement as BIM item in 2015-16 (please see list attached as **Ann-III**).

These additions have been agreed and Railways were advised to submit their demand to facilitate their procurement.

All other items except end fitting kit for HHP were approved. Proposal for Traction Motor End Fittings kit to be submitted to Board for approval.

7. Standardization of indents:

DMW had proposed that assemblies will be procured as per the latest modifications or in the form of kits. The proposal with regard to the following assemblies were agreed to during discussion for indent of 2015-16:

- i) **Lube oil pump assembly:** - Indent of lube oil pump and its components should be placed for only Herring bone design to PL No. 10063158. DMW has started supplying LOP Assembly with latest PL No.
- ii) **Water Pump Assembly:** - Indent of water pump assembly and its accessories should be placed for the latest modified design of RDSO to PL No. 10071829. DMW has started supplying WP Assembly with latest PL No.
- iii) **Water Pump, Lube Oil Pump and Extension Shaft Gear:** Railways to indent 3 gears in loco set as per modified P.L. No., which will be intimated to Zonal Railways.
- iv) **Stiffer Unit Camshaft:** Railways to indent Camshaft, Valve Lever, FIP Support items to Stiffer Cam Shaft design only.
- v) **Axle Boxes:** High Speed Axle Boxes being used on WDM3A, WDG3A and WDM3D locos only.
- vi) **Gears:** Bull Gears and Pinions for WDM2 and YDM4 locos – induction hardened only.

Railways have agreed to provide vetted indents in the form of kits wherever possible along with loose indents.

8.0 Feedback on modifications:

10 important Modifications were implemented in manufacturing/rebuilding of locomotives suggested by RDSO & Railway Board from time to time. Details of modifications are placed at **Ann-IV**. Following decisions were taken during meeting.

8.1 FRP Interior in Driver's Cab:

20 locos have been provided with FRP Interior in Driver's Cab since Feb'2013. During meeting, CMPEs expressed their unwillingness to go for this modification as FRP Interior is not maintainable due to cracks and cannot be repaired. Therefore, house has agreed to discontinue this modification on locomotives.

8.2 Computer Controlled Brakes (CCB):

64 locomotives have been provided with Computer Controlled Brakes (CCB) since July'2012. It was felt by Zonal Railways that fitment of CCB on ALCO locos imposes an additional requirement of training of running staff and maintenance staff.

9.0 Feedback on developmental items

Items fitted against Developmental Purchase Orders being advised to Railways from time to time. System of monitoring and reporting to be streamlined at shed level to ensure feedback timely. DMW has uploaded list of developmental items on its website for ready reference

10.0 Rate contract of spares:

Rate contract of 14 items have been undertaken by DMW. Latest status has been placed at **Ann-V**.

10.1 Difference in rates for common items

Difference in rates of common items is due to supply volume as well as status of vendor. In some cases, there is minor rate difference. Rate contract is enabling provision for the Shed. Railways may or may not avail it as per their requirements.

10.2 Proposal for New Rate Contracts for Spares:

Rate contracts for additional items have been proposed by Zonal Railways (placed at **Ann-VI**). Matter has been discussed in detail. This is contrary to Board (MM's) directives circulated by Railway Board vide letter No. 2014/M(W)/509/1 dated 23.01.2015. *"AMC has lead to movement away from core activities in the workshop. There is a need to develop our own capabilities for in house maintenance which would reduce dependence on AMCs for routine items"*. DMW apprised Board of the limitation of manpower in processing more and more RC cases.

AM/ME directed that DMW will continue to have Rate Contracts of existing items which have been done by DLW. Rate contracts for new items to be undertaken by Railways itself as per their specific need. AM/ME also mention that Board (MM's) directives on rate contracts must be complied. RRC for new items should only be taken up on specific directives from the Railway Board

11.0 REHABILITATION OF TURBO SUPER CHARGERS:

DMW is rehabilitating Turbo Super Charger of ABB and GE make received from Zonal Railways from time to time. Status of rehabilitation is placed at **Ann-VII**. One of the Railway desired that operation of RC to be exercised at Shed level directly.

Matter has been discussed in detail and decided to continue with the existing system due to various issues viz. Payment terms, Transport, Economic Quantity, OEM Opinion etc.

11.1 Double discharge Turbo Chargers:

Railways are sending Double discharge turbocharger of GE make to DMW. Railways may send their requirement, if any, within a month to access the exact requirement for rehabilitation. At present, more than 50 Nos. are lying in DMW for rehabilitation and there are no takers. Matter has been discussed and Railway Board may issue necessary guidelines on this issue. DME/Traction should examine and issue necessary instructions.

DMW would write to Board for obtaining permission to condemn/ disposal.

12. Warranty Claims:

Number of Tripartite meetings were held at Patiala between DMW, OEM and Shed Officials to settle warranty claims and disputes. Detailed position is placed at **Ann-VIII**. Matter has been discussed in detail and CMPEs have been advised that complaints to be registered with DMW for tenable warranty for speedy settlements.

AM/ME directed that Railways to submit their warranty complaints timely with details and DMW to examine whether warranty claims are tenable or not as per IRS conditions of contract. If tenable, then it should be expedited to finish.

13. Rebuilding of WDP1 Locos:

Board vide letter no.2012/M(L)/459/2 Pt.'E' dated 18.12.2014 has given programme of rebuilding of WDP1 locos. Programme shall be intimated by DLMW.

DMW mentioned that:

- Matter has been referred to PU Directorate of Railway Board regarding rebuilding of WDP1. The relevant extract is as –
- Under group incentive scheme, irregular activity cannot be taken. Prior approval of Board to be taken.
- Rebuilding of WDP1 is an irregular activity, for which DMW, Patiala has no core competency due to dissimilar nature of sub-assemblies (100 plus), no technical literature/manual, vendor base details from past procurement, no skill level.

On receipt of approval from PU Directorate, Railway Board, material procurement would be started.

Likely receipt of material is in 2017 only if OEMs accept the PO and supply around 100 plus uncommon items after finalization of tender as past purchase references not available.

Decision:

AM/ME directed that WDP1 is a regular Alco locomotive and reasons given by DMW for not taking up their rebuilding are not acceptable to Board. No

approval from PU Directorate is required. DMW to undertake rebuilding of WDP1 locos at the earliest.

TECHNICAL AGENDA ITEMS:

Following items were discussed:

1. 3RV/5RV Cylinder Liners of Cooper make
2. Performance of Fuel Injection Nozzle
3. Performance of PTLOC
4. Reclamation of Crank Shaft
5. Exhaust Manifold
6. Constant pressure brush holder for TM-4907 and AG 3101
7. Carbon Brush CB-21RF
8. Failure of NADI make RTTM Blower
9. Implementation of FEV recommendation
10. Auxiliary Power Unit
11. REMMLOT

Item No.1- 3RV/5RV Cylinder Liner

Zonal Railways and DMW reported failures of 3RV/5RV Cylinder Liners failing prematurely within two years of service. Majority of failures were due to top collar crack. Reason of failures based on failed samples and joint inspection are as under:

- Microstructure (i.e. type B,C&D graphite flakes in place of type A graphite flakes).
- Machining of liner OD instead of liner sleeve ID.
- High stresses due to usage of excess silicon resin (Dow Coming DC-14), which got sandwiched and hardened between engine block counter bore & cylinder liner collar.

RDSO conducted two rounds of quality audits of the firm jointly with M&C Directorate and recommended the following improvements –

| S. No | Suggested for improving the microstructure | Date of Implementation | Remarks |
|-------|--|------------------------|---|
| 1 | Inoculant changed from "Ferrosilicon" to "Big supersede extra ferrosilicon" an imported proprietary inoculants manufactured by Elkem Norway. | 15.06.2014 | Implemented by firm and included in QAP |
| 2 | External water cooling on die after 2.0 minute of the metal pouring into the die. | 15.06.2014 | |
| 3 | Casting die coating thickness increased for slow cooling. | 15.06.2014 | |
| 4 | Destructive testing for examination of Microstructure inspection frequency increased from one sample per day to one sample per shift (i.e. three samples per day). | 25.04.2014 | |

- Railway Board vide letter no. 2001/M(L)/466/2702 dated 04-06-2014 advised all the sheds not to machine the cylinder liners.
- DMW stopped the use of silicon resin for sliding liner into the base.
- Supplies made as per the revised QAP of the firm.

This issue has been discussed during meeting and following actions proposed:

- i) Liner after 15th June were also failing therefore, Zonal Railways to send detailed report to RDSO for further investigation.
- ii) ED/RDSO confirmed that re-study of design will be done after taking data from Zonal Railways.
- iii) RDSO to enhance vendor base.

Item No.2 - Performance of Fuel Injection Nozzle

Complaints of M/s Bosch make fuel injection nozzle getting crack in Alco locomotives have been received from various sheds of Indian Railways. These failures are causing fuel dilution in lubricant oil.

The detail of failures reported to RDSO, is as under:

| SN | Shed | Rly. | No. of failures | Remarks |
|----|------|------|-----------------|---|
| 1 | VTA | WR | 185 | Failures reported are of three years. Life attained before failure not indicated. |
| 2 | VSKP | ECOR | 59 | Failures reported are of two years. Below 2 years 28 Above 2 years 31 |
| 3 | KJM | SWR | 12 | Failures reported are of two years. Below 2 years 05 Above 2 years 07 |
| 4 | ED | SR | 70 | Below 2 years 25 Above 2 years 45 Duration of failures not mentioned. |
| 5 | GTL | SCR | 05 | Below 2 years 05 |

Zonal Railways have conveyed that majority of failures are due to vertical crack. WR has reported vide their letter no. M233/148/7 dated 22.07.2014 that the firm M/s Bosch vide letter no. AA/SAI-KAM/WC dated 24.06.2014 has conveyed that the failures are taking place due to high fuel line pressure (1500 bar) than the specified (1200 bar), for which nozzles have been designed. However, as per the results available of engine test bed of 3100/ 3300/ 3600 HP locos, the fuel line pressure is much below (maximum 1164 bar observed with 18 mm FIP in 3600 HP loco) the specified pressure i.e. 1200 bar.

To resolve quality issues, a meeting has been held at RDSO on 13.10.2014 with the firm i.e. M/s Bosch and DMW/Patiala. Following actions were decided to be taken by M/s. Bosch to resolve the quality issues:

- To collect failed samples from KZM, ED, VTA shed & DMW Patiala and submit investigation report.
- To conduct joint audit at KZM&VTA sheds for investigation of failures and review the maintenance practices being followed and report submitted to DMW & RDSO.
- To update the DO's and DON'ts to be followed by the shed for educating the maintenance staff.
- To conduct workshop to have technical interaction about reliability measure taken by the firm after conducting the joint quality audit.

Decisions:

- (i) RDSO to conduct joint audit in presence of M/s Bosch at Vatva Shed.
- (ii) Railways to send performance report data to RDSO for further study.

Item No.3 - Performance of PTLOC

PTLOCs are fitted in ALCO locomotives but their spares and maintenance technology are not available. The overhauling frequency is of 06 years. Overhauling by OEM is very costly and there is no way of ascertaining the quality of work done during overhaul.

| SN | No. of Locos | Service Life in year | Average Temp Drop |
|----|--------------|----------------------|-------------------|
| 1 | 14 | 0-1 | 3.8 |
| 2 | 19 | 1-2 | 3.6 |
| 3 | 12 | 2-3 | 3.4 |
| 4 | 25 | 3-4 | 2.8 |
| 5 | 15 | 4-5 | 2.8 |
| 6 | 6 | 5-6 | 2.8 |
| 7 | 2 | 6-7 | 2.6 |

It is seen that lube oil temperature drop across PTLOC starts reducing after 3 years of use. There is therefore a case for improving the product quality for reliable service upto 6 years life and also to extend the overhauling frequency to POH. Details in Lube oil temperature across lube oil cooler is given below:

| SN | Loco no. | Type | PTLOC Make | PIC | Service in Year | L.O. Temp. Inlet | L.O. Temp. Outlet |
|----|----------|-------|------------|------------|-----------------|------------------|-------------------|
| 1 | 11493 | WDM3D | ALFA LVEL | Jun-14 | 0.1 | 64.4 | 60.6 |
| 2 | 11479 | WDM3D | ALFA LVEL | 13-11-2013 | 0.6 | 65.2 | 61.4 |
| 3 | 17928 | WDM2A | ALFA LVEL | 23-03-2011 | 3.3 | 65.6 | 62.8 |
| 4 | 18711 | WDM3A | TRANter | 13-06-2008 | 6.1 | 65 | 61.8 |
| 5 | 17578 | WDM2A | TRANter | 14-12-2009 | 4.6 | 65.2 | 62.4 |
| 6 | 16809 | WDM3A | ALFA LVEL | 02-04-2013 | 1.2 | 66.8 | 63.2 |
| 7 | 11419 | WDM3D | TRANter | 27-11-2012 | 1.6 | 68.4 | 64 |
| 8 | 17809 | WDM2A | TRANter | 26-02-2011 | 3.3 | 65.8 | 61.2 |
| 9 | 17513 | WDM2A | TRANter | 14-10-2011 | 2.7 | 64.2 | 60.8 |
| 10 | 16812 | WDM3A | ALFA LVEL | 14-02-2011 | 3.4 | 66.4 | 63.8 |
| 11 | 16171 | WDM3A | TRANter | 08-04-2008 | 6.2 | 66.2 | 63.6 |
| 12 | 18525 | WDM2A | TRANter | 27-12-2010 | 3.5 | 65.4 | 63 |
| 13 | 11420 | WDM3D | TRANter | 04-12-2012 | 1.6 | 67.4 | 64.8 |
| 14 | 16158 | WDM3A | TRANter | 30-06-2008 | 6.0 | 67.4 | 64.6 |
| 15 | 17536 | WDM2A | TRANter | 01-09-2011 | 2.8 | 64.2 | 62.4 |
| 16 | 16834 | WDM3A | TRANter | 25-05-2013 | 1.1 | 63.2 | 60.4 |

DMW mentioned that:

- (i) RDSO to provide comprehensive thermal load analysis of Lube oil temperature difference across Lube oil cooler by taking into all relevant factors.
- (ii) Railways to confirm fitment of Centrifuge in locos with PTLOC.
- (iii) Railways to confirm use of DM water in cooling system.
- (iv) Railways to confirm frequency of Centrifuge maintenance as per RDSO MI.
- (v) RDSO to examine possibility of Gasket-less design, if any to improve maintainability .up to 08 years against 06 years.

Decisions:

- (i) ED/Motive Power, RDSO confirmed that design study will be under taken again.
- (ii) Inter-changeability issue to be re-examined by RDSO.

Item No.4 - Reclamation of Crank Shaft

Diesel shed VTA& RTM has sent 15 nos of crankshafts for repair to DMW-PTA. Till date no advice is received regarding return of the same.

VTA - 6 / 27-3-13, 3/ 12-5-13, 1/ 30-4-14 and RTM – 5/ 5-11-12.

In this reference a letter was written by WR to CME –DMW-PTA dtd 1-7-14. At present 12 Crankshafts are lying at RTM shed & 3 Crank shafts at VTA shed. Other Railways would have such crankshafts.

It is required to look into stepping up crankshaft reclamation through DMW.

Decisions:

- (i) DMW will dispatch 05 Nos. rehabilitated Crankshafts in Mar/Apr'15 to RTM/VTA shed as other crank shafts have been condemned.
- (ii) W.Rly should ensure that only Crank shaft to be sent to DMW where **“Crankshaft which requires work on single Crank pin or journal and key way will be taken by firm for rehabilitation”**
- (iii) DMW will step up reclamation of Crank Shafts in 2015-16 on receipt of reclaimable Crank shaft.

Item No.5 - Exhaust Manifold

Failures of Exhaust Manifold have been reported by Zonal Railways. Design has been modified in January 2013. Zonal Railways were asked by DLW to send performance feedback of modified design Exhaust Manifolds.

ZRs may share make wise failure data of modified design exhaust manifold assembly. DLW may elaborate the design changes.

Decisions:

- (i) Zonal Railways to share failure data with DLW
- (ii) DLW to revalidate drawing of Exhaust Manifold and take up the issue with approved vendors.

Item No.6 - Constant pressure brush holder for TM-4907 and AG 3101

Based on the successful field trials, Railways have been intimated for implementing newly designed constant pressure brush holder for TM4907 in 5 loco sets as per mod sheet no. MP.MOD.EM.04.05.11 (Rev-00) and specification no.MP.0.2400.76 (Rev-00). For auxiliary machines AG3101, complete replacement of conventional holder with constant pressure design based on mod sheet no. MP.MOD.EM.06.30.10 (Rev-00) and specification no.-MP.0.2400.71 (Rev-00).

For TM4907 brush holder feedback from SWR/Hubli and NR/NDLS has been received and found satisfactory and from other sheds performance is still awaited. For AG3101 brush holder feedback has been received from NR, SWR, CR, SER, SECR and found satisfactory and from other sheds performance is still awaited.

Railways may discuss about fitment and performance of constant pressure brush holder and about the extended field trials.

Decisions:

RDSO to take feed-back from Zonal Railways and DMW
DMW purchased 96 nos. Constant Pressure Brush Holders, but could not be used as spring pressures was observed 3.5 kgf against specified 4.5 kgf – 5.4 kgf. RDSO to sort out issue. The cost of constant pressure brush is high, therefore, its economic feasibility to be re-examined vis-a-vis benefits derived from constant pressure brush holder, before opting for large scale fitment.

Item No.7 - Carbon Brush CB-21RF

Based on the comparative analysis of carbon brush for TM4907 i.e., CB-21RF with carbon brush sample of GE752, the design features of carbon brush for GE-752 and TM907 were studied in detail and RDSO vide letter no. SD.DFM. A2.2 dated 24-10-14 has submitted detailed report to DMW along with five alternative proposals for mitigating the failures CB21RF carbon brush.

- a) The design features of carbon brush for GE-752 and TM907 have been studied in detail.
The present failures of carbon brushes are mainly due to:
- (i) Uneven pressure of spring on carbon brush leading to excess flow of current.
 - (ii) Flaring of pigtails due to sharp edges of spring of TM4907 brush holder.
 - (iii) Ovality of commutator surface.
 - (iv) Uprooting of pigtail
 - (v) Individual sleeves not provided on all four pigtails
 - (vi) Tying of all four pigtails.
- b) The parameters of both GE752 carbon brush and TM4907 brush have been studied in detail and comparative analysis of both along with RDSO comments are appended at Annexure-II.
- c) Further current carrying capacity of pigtails also examined as per IS13466 and it is observed that shunts are underrated for carrying a rated current of 1000A.
- d) Based on study of comparison of parameters of GE make carbon brush grade T-900 with E-88X (I), EG-6754 and EG-14D, following actions are proposed.
- (i) As a first step all Cu wires in flexible 7x58x40SWG may be fitted on trial.
 - (ii) Alternately shunt size 7x76(65Cu+11SS) as per IS13466 or nearer to that may be tried.
 - (iii) Provision of individual sleeve on all four pigtails.
 - (iv) Sharp corners and edges of existing spring need to be rounded off.
 - (iv) Trials of constant pressure brush holder on TM4907.

Decisions:

RDSO to issue modified STR on priority.

Item No.8 - Failure of NADI make RTTM Blower

Performance of RTTM Blower supplied by M/s NADI fitted in newly received ALCO locos is poor and 03 no. RTTM Blowers have failed out of 05 locos till date. Recently 20 nos. Nadi make RTTM Blower also received from PTA against NS Indent.

The failure on account of abnormal sound coming from blower on RTM/WR based locos of Nadi make RTTM Blowers are as under;

| SN | Item S.No. | Loco no. | Last sch.date& fitted by DMW | PIC | Date of failure | Service life (Month) |
|----|---------------|----------|------------------------------|----------|-----------------|----------------------|
| 1. | 2012/10/77092 | 11482 | 22.11.13 | 22.11.13 | 24.01.14 | 02 |
| 2. | 2012/10/77103 | 11481 | 16.11.13 | 16.11.13 | 02.02.14 | 02 |
| 3. | 2012/10/77485 | 11500 | 02.02.14 | 02.02.14 | 23.04.14 | 2 ½ |

Decisions:

- (i) Railways to send feed-back of RTTM Blower to DLW
- (ii) DLW to suggest remedies and vendor base to be enhanced
- (iii) Proto type to be tested again by RDSO

Item No. 9 - Implementation of FEV recommendation

Increase in Horse Power of ALCo locomotives from 2600 to 3100/3300 caused cases of engine block distortion, biased wear of the main bearing, uneven clearance between bearing and crankshaft etc. This resulted into seizure of main bearing and failure of connecting rod, piston pin, crankshaft and gear etc.

This called for engagement of a consultant who would assess the feasibility of existing engine block being used to achieve the HP values of 3100 and 3600 hp in ALCo engine configuration, identify the problems if any, and suggest the solutions.

Work of consultancy with M/s FEV Germany was undertaken in order to identify the problems and suggest solutions. Recommendations of the consultant were discussed with the PUSie DLW/DMW from the viewpoint of implementation. Accordingly vide Mod sheet No.MP.MOD.EN.01.02.12, PUs were requested to implement the modifications.

PUs may share their experience regarding the implementation and provide current status on implementations and performance of the engine blocks supplied with the modifications.

Decisions:

- (i) DMW has implemented modifications advised by RDSO
- (ii) Bearings with more crush height are under trial and RDSO to take final call on this issue.

Item No. 10 - Auxiliary Power Unit (APU)

More than 100 ALCO locos fitted with APU are working in the field. In general, it is observed that around 55% of APU favourable hours (hours which are favourable for APU to cut in) are wasted due to various reasons.

The position of the 75 locos found working with APUs as on 08.03.15 is placed at Annexure-III.

It is observed through REMMLOT that 60 to 70% of APU favourable hours are lost on account of loco running crew as 'For/Rev' handle is not kept in neutral position, when the train stops (which is the pre-condition for the APU cut in) and around 30 to 40% of APU hours are wasted due to APU related problems (which prohibit the APU to cut in). There is an urgent need to educate the running staff and further improve the reliability of the APUs. Zonal Railways may please furnish the actions taken to improve the utilisation of APUs.

Decisions:

- (i) Railways to educate Loco running crews on continuous basis to derive full benefits of APU.
- (ii) RDSO to examine design improvement for APU components in light of repeated failure like cranking contractor circuit open, fuel oil level, APU engine RPM low, APU water level low, Fuel pipe breakage etc. (16 nos. of APU) – as reported by Shed.

Item No. 11 - Utilisation of REMMLOT towards predictive maintenance

A committee consisting of Dir/RDSO, SrDME/DSL/GY, Sr.DME/VSKP, Sr.DME/GD has rationalized fault parameters and finalized the formats for the MIS reports. These formats have been posted in the www.loconet.in and reports are being generated. Automatic SMS generation for the critical faults are also being generated and sent to the various field functionaries.

REMMLOT can contribute immensely towards predictive maintenance philosophy by trend mapping of locomotive systems which enable early detection of minor problems thereby preventing major failures and loss of locomotive availability. Though this is already being done in limited way and there is lot of scope for improvement. The scope of this need to be worked out.

Decisions:

- (i) Railways to send feedback on utilization of REMMLOT to RDSO
- (ii) There is only one vendor i.e. M/s Medha, more sources to be developed for its mass application.

Action Plan for less compliance Ann 'N' items:

| SN | Item | Indent Qty | Supplied till date | Remarks |
|----|------------------------------|------------|--------------------|---|
| 1 | Spacer for Stiffer Cam Shaft | --- | --- | Loose spacers of SUCS were received from Zonal Railways. DMW has supplied 266 sets and 111 kits of SUCS. The loose spacers will be supplied April'2015 onwards. |
| 2 | Gear Water Pump un-modified. | 573 | 224 | Raw material for this items is available. Supply will be completed by April/May 2015. |
| 3 | Piston Pin Assembly | 2773 | 1304 | Supply to Zonal Railways has been started and will be completed by April/May 2015. |
| 4 | Equalizer Spring Seat MG. | 191 | 69 | Purchase order has been placed on M/s Ganesh Foundry. Supply will be completed by May/June 2015. |
| 5 | Idler Gear - FD | 132 | 22 | Under manufacturing and will be supplied by Mar/April 2015. |

Action Plan for less compliance BIM' items:

| SN | Item | Indent Qty | Supplied till date | Remarks |
|----|-----------------------------|------------|--------------------|---|
| 1 | Crank Shaft 6 Cyl. 10141110 | 21 | 0 | 28 Nos. will be shipped from M/s CSR, China in last week of Mar'15. Supply will follow. |
| 2 | FIP Calibrating stand | 12 | 0 | Under TC and likely to be finalised by March end. |
| 3 | Master Pump kit 17mm | 78 | 0 | Under TC and likely to be finalised by March end. |
| 4 | High capacity Buffer | 208 | 0 | PO placed on following firms: 1. Khargpur Metal - 307 2. A.D.Electric - 165 3. Frontier - 100 100 nos under despatch from firm. |
| 5 | Valve seat grinder | 51 | 02 | PO placed for 123 Nos. on M/s Indian Instruments and 55 nos. is likely to be received in 1st week of April. |

Ann-II**PROPOSED DELETION OF ANN. 'N' ITEMS W.E.F. 2016-17:**

| SN. | PL No. | Desc. | Indents 15-16 | Rlys | Indenting Rlys |
|------------|---------------|---------------------------------------|----------------------|-------------|--------------------------|
| 1 | 10124317 | OUT BOARD BRG. HOUSING (WDM2) | 6 | 1 | SER-6 |
| 2 | 10140827 | SHAFT ROTOR 720A1 TURBO (WDP1 & WDM2) | 19 | 4 | ER-3, NER-8, SR-4, SER-4 |
| 3 | 10120427 | FP SUPPORT (WDM2) | 71 | 2 | SR-9, ECR-62 |
| 4 | 10141042 | SHAFT ROTOR 350C (YDM4) | 19 | 4 | ER-3, NER-8, SR-4, SER-4 |
| 5 | 10211585 | FUEL CONTROL SHAFT (YDM4) | 14 | 2 | WR-4, SECR-10 |
| 6 | 10211639 | CONTROL CABLE END (YDM4) | 48 | 2 | ER-4, SR-44 |
| 7 | 10216248 | GEN. END SHAFT R-9 (WDM2) | 44 | 3 | NER-16, ECR-4, WCR-24 |

PROPOSED ADDITION OF ANN 'N' ITEMS w.e.f. 2015-16 Onwards:

| SN | Description | PL No. | Remarks |
|----|------------------------------|----------|-----------------|
| 1 | MB Stud Center FEV (12.9) | 10217540 | Proposed by DMW |
| 2 | MB Stud Inter FEV (12.9) | 10217538 | |
| 3 | Stud Bolt MB Center (12.9) | 10990940 | |
| 4 | Stud Bolt MB Inter (12.9) | 10990812 | |
| 5 | Modi. Wing Nut Inter (12.9) | 10143415 | |
| 6 | Modi. Wing Nut Center (12.9) | 10141388 | |
| 7 | Plain Nut Center (12.9) | 10221396 | |
| 8 | Plain Nut Inter (12.9) | 10220719 | |
| 9 | S Pipe FEV | 10236363 | |

PROPOSED ADDITION OF BIM ITEMS w.e.f. 2015-16 Onwards:

| SN | Description | PL No. | Remarks |
|----|---------------------------------|--------|-----------------|
| 1 | Traction Motor End Fittings kit | | Proposed by SCR |

Feedback on Modifications:

| SN. | Description | Fitted in Rebuilt Locos since | No. of locos fitted as on 02.03.15 |
|------------|--|--------------------------------------|---|
| 1 | ATHS Bogie Frames | Jan'14 | 45 |
| 2 | FRP Interior in Driver Cab | Feb'13 | 20 |
| 3 | Computer Controlled Brakes (CCB) | July'12 | 64 |
| 4 | Auxiliary Power unit | April'12 | 115 |
| 5 | REMMLOT(Remote monitoring management of Locomotive & Trains) | July'11 | 250 |
| 6 | Roof mounted DBR (RMDBR) | May'10 | 545 |
| 7 | 3 RV Piston Kit | April'10 | 717 |
| 8 | 18 mm Fuel Injection Pump | April'10 | 427 |
| 9 | Tight Lock Coupler & Soft Draft Gear with Yoke | March'10 | 427 |
| 10 | Microprocessor Control System | April'07 | 915 |
| | | | |
| | | | |
| | | | |

Ann-V

Rate contract of Spares:

| SN. | Item | Firm M/s | Contract No. | Valid up to | Extendable up to |
|-----|--|-----------------|---|-------------|------------------|
| 1 | VTC-304 TSC | ABB | 20/11/5003/1/309224 dt. 20.12.11 | 30.06.15 | Non Extendable |
| 2 | Woodward Governor | Woodward | 20/11/5004/1/309834 dt.28.05.12 | 27.08.15 | Non Extendable |
| 3 | Air drier | Knorr Bremse | 20/11/5010/1/310524 dt.11.12.12 | 09.06.15 | 09.12.15 |
| 4 | Air drier | Faiveley | 20/11/5007/1/310319 dt.17.10.12 | 31.03.15 | Non Extendable |
| 5 | Air drier | Stone India | 20/11/5006/1/309720 dt.02.05.12 | 30.10.14 | 31.10.14 |
| 6 | Compressor | ELGI | 20/12/5100/1/310382 dt.03.11.12 | 01.11.15 | 30.04.16 |
| 7 | Compressor | KPC | 20/12/5100/1/310381 dt.03.11.12 | 01.11.15 | 30.04.16 |
| 8 | Paper less speed recorder & Indicator | Autometer | 21/11/5000/1/310406 dt.26.10.12 | 25.04.15 | Non Extendable |
| 9 | Paper less speed recorder & Indicator | Medha | 21/11/5001/1/310311 Dt.16.10.12 | 15.04.15 | 15.10.15 |
| 10 | Paper less speed recorder & Indicator | LAXVEN | 21/11/5005/1/310565 Dt.18.12.12 | 17.06.15 | Non Extendable |
| 11 | TPR-61 TSC(overhauling) | ABB | 20/12/5101/1/310345 Dt.23.10.12 | 31.03.15 | Non Extendable |
| 12 | Microprocessor | Medha | 21/11/5004/310364 Dt.31.10.12 | 30.10.15 | 30.10.16 |
| 13 | Overhauling of Control & Actuator unit of MCBG | Medha | 21/13/5000/1/312809 dt. 09.07.14 | 08.07.16 | 08.01.17 |
| 14 | Overhauling of PTLOC | Tranter | DLW/ALCO/MC(PTLOC)/01/02/ Tranter dtd.22.12.11 | 31.08.15 | Non Extendable |
| | | Alfa Laval | New case | | |

PROPOSED NEW RATE CONTRACTS OF SPARES

| SN. | Item | Make | Proposed by Rly |
|------------|-----------------------------------|------------------------|------------------------|
| 1 | Plate Type lube oil Cooler | ALFA & Tranter | ECR, NCR |
| 2 | Moatti Filter for Lube oil system | ALFA | NCR, ECR, SR, SCR |
| 3 | AC Fuel Pump Motor | Signatron | NCR , SCR |
| 4 | REMMLOT | Medha | NCR |
| 5 | Air Dryer Overhauling | All makes | NWR , SCR |
| 6 | Overhauling of VTC 304 2300HP | Thru' OEM | SCR |
| 7 | Upgraded Compressor | Thru' OEM | SCR |
| 8 | Bogie Frame overhauling | Thru' approved vendors | SCR |
| 9 | Spares for 18mm FIP | Thru' OEM | SR |
| 10 | CCB | | ECR |

Ann-VII

REHABILITATION OF TURBO SUPER CHARGERS:

| DESC | Prodn Plan 2014-15 | Supply status Till 20.03.15 | Under repair with firm | Lying with DMW for repair | Dispatched to Riys |
|-------------|---------------------------|------------------------------------|-------------------------------|----------------------------------|---|
| ABB-TPR61 | 200 | 159 | 24 | 03 | ECOR-16, SEC-11, WCR-12, ECR-19, NR-8, NWR-9, ER-13, SER-22, WR-12, NCR-9, NFR-6, SWR-4, SR-14, NE-2, SCR-2 |
| ABB-VTC304 | 50 | 50 | 0 | 2 | ECR-8, ER-9, NR-5, ECoR-5, WR-4, NWR-3, SR-10, CR-6 |
| ABB-2300HP | 10 | 10 | 0 | 1 | NR-10 |
| GE-SV | 75 | 71 | 0 | 55 | ECR-8, SER-11, SCR-8, SR-1, NFR-4, NR-4, ER-11, NWR-4, WR-7, NCR-3, SWR-4, ECoR-6 |
| GE-DV | 0 | 0 | 0 | 53 | |

Ann-VIII

WARRANTY CLAIMS:

| SN. | Items | Date | No. of complaints | | Sheds attended |
|-----|-------------------------------|----------|--------------------|-----------------|---|
| | | | Discussed (Total) | Registered (WC) | Date |
| 1 | TSC(ABB) | 15.07.14 | 16 | NIL | RTM, LDH, NKJ, VSKP, TKD, AMV, KYN, VTA, RAI, UDL, SPJ,BNDM>L |
| | | 18.10.14 | 17 | NIL | BNDM |
| 2 | TSC (GE) | 15.07.14 | 06 | 01 | RTM, LDH, NKJ, VSKP, TKD, AMV, KYN, VTA, RAI, UDL, SPJ,BNDM>L |
| | | 29.01.15 | 07 | 07 | RTM, KJM, NKJ, VSKP, GY, ET, UDL, HWH, VTA, SPJ, GTL&JMP |
| | | 02.03.15 | 08 | 05 | KGP, BKSC, BNDM, VSKP, KJM,MLDT,BWN,UDL,ET, HWH, ED,NGC&LDH |
| 3 | CYL.HEAD (Cooper) | 15.07.14 | 65 | 02 | RTM, LDH, NKJ, VSKP, TKD, AMV, KYN, VTA, RAI, UDL, SPJ,BNDM>L |
| | | 29.01.15 | 08 | 08 | RTM, KJM, NKJ, VSKP, GY, ET, UDL, HWH, VTA, SPJ, GTL&JMP |
| 4 | CYL. LINER 3RV & 5RV (Cooper) | 15.07.14 | 35(3RV) 22(5RV) | 04(3RV) | RTM, LDH, NKJ, VSKP, TKD, AMV, KYN, VTA, RAI, UDL, SPJ,BNDM>L |
| | | 29.01.15 | 02 | 02 | RTM, KJM, NKJ, VSKP, GY, ET, UDL, HWH, VTA, SPJ, GTL&JMP |
| | | 02.03.15 | 05 | 05 | KGP, BKSC, BNDM, VSKP, KJM,MLDT,BWN,UDL,ET, HWH, ED,NGC&LDH |
| 5 | STEEL CAP PISTON (FLGIL) | 09.10.14 | 02 | 02 | LDH, NKJ |
| 6 | EXHAUST MANIFOLD (Ionic) | 29.01.15 | 05 | 05 | RTM, KJM, NKJ, VSKP, GY, ET, UDL, HWH, VTA, SPJ, GTL&JMP |
| | (Vikrant) | 29.09.14 | NIL | NIL | AMV, LDH, GTL& AJMER |
| | (Vikrant) | 29.09.14 | 02 | NIL | AMV, LDH, GTL& AJMER |
| | (D. Ranflex) | 16.02.15 | 02 | 01 | WR/HQ, RTM, UDL, GD, NGC, SPJ, RAI, GTL& PR |
| | (Ransal) | 16.02.15 | 02 | 01 | WR/HQ, RTM, UDL, GD, NGC, SPJ, RAI, GTL& PR |
| | (Paul & Co.) | 16.02.15 | 01 | NIL | WR/HQ, RTM, UDL, GD, NGC, SPJ, RAI, GTL& PR |
| | ((Ionic) | 16.02.15 | 34 | NIL | WR/HQ, RTM, UDL, GD, NGC, SPJ, RAI, GTL& PR |
| | | 16.02.15 | 02 | 02 | WR/HQ, RTM, UDL, GD, NGC, SPJ, RAI, GTL& PR |