Compendium On
Crane Maintenance- Group Meetings for instructions on 140 T Cranes

IRCAMTECH/GWL/M/CMG.meeting February- 2017

Indian Railways
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Compendium on Crane maintenance-Group meetings for Instructions on 140 T Cranes
FOREWORD

The Compendium on instructions for 140 T cranes has been prepared by CAMTECH as per recommendations of Railway Board circulated vide letter No. 2013/M(M&P)/7/2/DM/Rescue dated 8th January 2016. In this compendium minutes of all CRMG meetings held in various Zonal Railways, Railway Board and RDSO for strengthening of maintenance and operations of 140 T cranes have been provided. All policy decisions taken during CMPE (R&L) meeting/crane maintenance group meeting time to time have been itemised in the chapters for assistance of Zonal Railways. I am sure that this handbook will be useful to the concerned staff to ensure trouble free service of the 140 T cranes.

Technological up-gradation and learning is a continuous process. Hence feel free to write us for any addition / modifications or in case you have any suggestion to improve the Hand Book, your contribution in this direction shall be highly appreciated.

We welcome any suggestion for addition and improvements from our readers.

Place: CAMTECH/GWL
Date: 14.02.2017

(A R Tupe )
Executive Director
CAMTECH/GWL
PREFACE

140 Break down Crane maintenance is an important asset of ‘A’ class ARTs of Indian Railways. The maintenance of cranes is being carried out in nominated Workshops and open line for strengthening of disaster management system. The maintenance & component details of crane maintenance are given in this handbook. This handbook contains the instructions issued in Crane maintenance Group meetings time to time. The first CRMG meeting was held in 2000 for submitting its minutes to Railway Board for planning of strategy for safe maintenance and operations of 140 T cranes. The Minutes of meetings of these eleven CRMG meetings are compiled in this hand book for use of crane maintenance and staff of “A” class ARTs.

This hand book is aimed at assisting concerned staff for enhancing knowledge \. The handbook does not supersede any existing instructions issued from Railway Board, RDSO, IRCA or OEMs etc. Most of data and information mentioned herein are available in some form or the other in various letters of Railway Board and OEMs manuals. For convenience of revision/corrections, this book includes a proforma for entering all correction slips serially.

Technological up gradation and learning is a continuous process. Hence feel free to write us any addition / modification in this handbook or in case you have any suggestion/Guidelines to improve the handbook. Your contribution in this direction will be appreciated.

Date: - 14.02.2017

(K.P. Yadav)
Director/ Mech.
CAMTECH/GWL
CORRECTION SLIPS

The correction slips to be issued in future for this handbook will be numbered as follows:

CAMTECH/M/16-17/CMG.meeting/1.0/C.S. # XX date ……………

Where “XX” is the serial number of the concerned correction slip (Starting from 01 onwards)

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1.3. Net-connectivity at crane depots & video calls through net telephone
1.4. Provision of Mobile phones to crane driver/ technician and Workshop service team
1.5. Pictorial Do’s and Don’ts
1.6. Failures/defects on specific cranes reported by various were discussed by the Group
   1.6.1 Gottwald Cranes
   1.6.2 Cowans Sheldon Cranes

2.0 INFRASTRUCTRE AT DEPOTS
2.1 Provision of Covered Shed at crane depots
2.2 Review of infrastructure for schedule maintenance at crane depots
3.0 AMC FOR CRANES/SUB-ASSEMBLIES
   3.1 Centralized AMC for Cummins Engine
   3.2 AMC for various-assemblies

4.0 CRANE DRIVER TRAINING
4.1 Development of pool of crane drivers and support staff
4.2 Training of 140 T Drivers
4.3 Training of Crane Maintenance Staff

5.0 FITMENT OF CBC ON CRANES
6.0 Approach to POH and MLR and tackling issues of obsolescence and action plan to liquidate over dues
   6.1 Plan of Jamalpur & Parel workshops liquidate over-dues
   6.2 Obsolescence issue of Cowans Shedon cranes
   6.3 Obsolescence issues of Gottwald cranes

7.0 CODAL LIFE OF 140 T CRANES – STRUCTURAL AUDIT
7.1 Special MLR of Cranes
7.2 Structural Audit of Cranes

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A. Address by Member Mechanical
B. Address by Member Engineering
C. Address by EDME (Tr)
D. Discussion on Agenda points
E. Issues related to m/S Cummins
F. Discussion with M/s PS Engineering and M/s Indtel
G. Other Issues

List of officers who attend the 10th Crane Maintenance Group Meeting held in Railway Board on 10th December, 2013

#### 11. Minutes of the 11th Crane Maintenance Group Meeting held at RDSO on 11th February’2016

A. Address by AM (ME)
B. Address by EDME (Tr)
C. Inauguration of books/manuals prepared by CAMTECH, Gwalior
D. Discussion on ATR 10th CRMG
E. Discussion on Railway Board’s Agenda Points
F. Issues related to AMC
G. Reporting of Minor failures “on site/offsite” to JMP
H. Reporting of Minor failures “on site/offsite” to JMP
I. Overdue POH/MLR and Action Plan to liquidate
J. Rate Contract
K. Issues related to M/s Cummins
L. Discussion with P S Engineering
M. Discussion with M/s Agromach
No. 2000/M/M&P)/175/1

1.0 Minutes of the 1st Crane Maintenance Group Meeting held at Jamalpur on 24th & 25th April, 2000.

The following attended the meeting:

**S/Shri**

**Railway Board**
K.L. Chhabra, ED (Dev)
A.K. Khosla, DME (P)II

**IRIMEE**
Arvind Mathur, Director
Arjun Mundia, Prof.
Mukund K Sinha, Asstt. Prof.

**Central Railway**
P.S. Gupta, CWM/Parel
U. Borbankar, sr. DME/NKJ
L.C. Trivedi, Dy. CME (P&F)
M.M. Qureshi, AWM/Parel

**North Eastern Railway**
DK Srivastava, Sr. DME/Gonda
S Lahiri, Sr. DME/Siligurai
Gauri Shankar, Dy. CME (O&F)

**Eastern Railway**
Nikhlesh Jain, CWM/JMP
S.M. Bhardwaj, CWE
AK Tiwari, CME (O&C)
DC Sharma, Dy CME/JMP
Akhilesh Mishra, AWM/JMP
RN Saha, DME (P)/ASN
AK Gupta, Dy. CME/JMP
Pankaj Singh, DME (P) DHN
K Ramnaiya, DME (P)/HWH
AK Sinha, Dy. CME (O&C)/MGS

**Northeast Frontier Railway**
KK Mazumdar, Dy. CME (R&L)

**RDSO**
MP Sinha, Dir. Std. (MP)

**Southern Railway**
GH RadhaKrishnan, Dy CME (R&L)

**South Central Railway**
BM Shyam Singh, CMPE (R&L)
U Subba Rao, Sr. DME(C&W/Hubli)

**South Eastern Railway**
BL Harijan, CMPE (R&L)
TV Subba Rao, Sr. DME/CKP

**Northern Railway**
Vijay Kumar, Sr. DME/Ludhiana

**Western Railway**
P Agarwal, CMPE (R&L)
NS Patial, Sr. DME/Ratlam
| ALL Railways | ED (Dev.)/Railway Board and CWM/JMP welcomed the delegates to the inaugural Crane Maintenance Group meeting and expressed the hope that this Forum shall address various issues viz., training of operators and maintenance staff, procurement of maintenance spares, preventive maintenance schedules etc which affect the reliability and availability of Breakdown Cranes, 140 T Cranes in particular, and also improve Railway’s effectiveness in tackling accidents. Shri D C Sharma, Dy CME (Cranes) presented an Overview of the crane manufacturing activities at Jamalpur Workshop. The presentation highlighted the milestones and the shortcomings. A list of areas where assistance is required was also discussed. |
| All Railways CWM/JMP, Parel | **Installation of PCs at all Crane Sites:** Railway Board has delegated powers to all GMs, DRM's, PHODs and SAG officers heading independent establishment (vide Railway Board’s letter no. 98/C&IS/Comp/Policy, dated 02.11.98) for purchase of PCs every year. It was decided that under these powers all 140 T Crane location shall install one PC with FAX, Modem and e-mail facilities. This should be completed by September’ 2000. |
| ALL Railway JDTC (G)/Rly. Bd. | **Review of Hire Charges for 120 T/140 T Cranes:** Railways complained that the existing guidelines for line hire charges at 120 T/140T Crane have not correctly been laid down and the hire charges stipulated at present are extremely low and not commensurate with the high cost of these cranes. This needs to be reviewed immediately by Board’s Traffic (Commercial) Directorate. |
| EDS(M)/RDSO All Railways | **Issue of Crane Maintenance Schedule forms by RDSO:** RDSO shall issue schedule forms to be followed by all crane users during periodic maintenance schedules of the new Gottwald Cranes recently received. This must be done by Au. 2000. For the old Gottwald as well as Cowans Cranes RDSO should issue revised schedule forms for all types of preventive maintenance schedules as well as POH, based on the experience gained by Railways and JMP and Parel workshop so far. During each schedule, users must inspect the crane for structural damages in vulnerable areas like Match Truck, ‘A’ frame, Gallows, Boom and load pulleys etc. and this check should be incorporated in the new schedule forms to be issued by RDSO allogwith sketches of vulnerable areas. |
| CWM/JMP | **Annual Maintenance Contracts**:  
1.0 Engine:  
So far none of the Railways have entered into an Annual Maintenance Contract with Cummins for overhaul of the diesel engine of the 140 Crane. NR advised that they had an AMC with Cummins for Delhi Crane. This crane has since been transferred to LDH. NR is now in the process of finalizing terms and conditions for a comprehensive Annual Maintenance Contract for diesel engine of 140 T Cranes on the lines of AMC entered into by NR for Cummins Diesel engine fitted on DMUs.  
It was decided that JMP Workshop shall prepare model terms & conditions for Diesel engine Annual Maintenance Contract and circulate to all Railways. |
| All Railways |  |  |
| All Railways | **2.0 Hydraulics**:  
The Group after deliberating on the overhaul requirements of hydraulic circuits and equipment decided that no AMC would be required for these items at this stage. |
| All Railways | | |
| CMEs/ER & CR | Functioning of safe Load Indicators on old Cranes supplied by Gottwald and Cowans and discussed. It was decided that keeping in view the reliability problem of this equipment, Railways need to go in for AMC of Safe Load Indicator system on the old cranes and that JMP Workshop should finalize the AMC for the Gottwald design crane and Parel Workshop for Cowans design crane and operation of the AMC shall be by respective Sr. DMEs. Some sources of SLI are available with JMP Workshop and these can be tried out by Parel Workshop as well. |
| CMW/Parel | | |
| CWM/JMP | | |
| EDME (Tr.) | **Rationalization of Crane types on Railways**:  
CWM/JMP suggested that to facilitate inventory control and training of experts for maintenance and operation cranes of one type should all be concentrated preferably on the same Railway or at best on adjoining railways. This shall be examined by Railway Board. |
| DME (P) II | | |
| EDS/(MP)/RDSO | **Standardization of Infrastructural requirements for basing 140 T Cranes**:  
RDSO should standardize the infrastructural requirements for basing 140 T Cranes. The requirement shall cover stabling facilitates, Pit, |
covered shed, battery charging facility, storage area for lifting tackles, material handling facilities and tools etc. This should be done by July 2000.

| CME/ER &CR CWM/JMP & Parel All Railways | **Service Engineering Group:**  
All Railways expressed the need for continuing the Service Engineering Group (SEG) by JMP and Parel Workshops. For this purpose, the Railways must accept necessary debits raised by JMP and Parel Workshops. JMP shall ensure that adequate staff and supervisors are got trained in various critical areas viz., hydraulics, SLI etc, SEG should start visiting the respective cranes with effect from May 2000. Similar action shall be taken by Parel for Cowans Cranes.  
AWM/Crane Design/JMP Shri Akhilesh Mishra gave an excellent presentation on Service Engineering Group and on the prospects of effecting quantum improvements in the work done by SEG through the setting up of a virtual private network which shall make possible a continuous dialogue among crane users and JMP workshop. CWM/JMP should send the proposal to Railway Board for further action. |

| Dir./IRIMEE CWM/JMP ED (Trg. & MPP) | **Training in operation & maintenance of 140 T Cranes:**  
Lack of adequate training facilities for operation and maintenance of 140 t Break down Cranes of various types was identified as an area of major weakness. It was decided that IRIMEE shall be the nodal centre for training of all supervisors, officers and staff of 140 T cranes. For this purpose, IRIMEE shall start arranging basic grounding training of operators/Crane Drivers, Maintenance Supervisors, Staff and officers at FTI followed by theoretical classes for crane maintenance and operations in association with Jamalpur Workshop. IRIMEE shall also develop in-house expertise in hydraulics. ED (Trg & MPP) should issue necessary directives to IRIMEE in this regard and also direct IRIMEE to develop detailed training modules separately for operators, maintenance staff, supervisors and officers. Director/IRIMEE requested Railways to nominate officials who are experts in the field of maintenance and operation of 140 T Cranes and can help the institute make a good beginning. Railway should send bio data of such officials to IRIMEE by may 2000. |
| CME/ER & CR  
| CWM/JMP & Parel  
| All Railways | **Operators/ Crane Driver certification:**  
|  | At present there is no formal system of imparting training for operators/crane drivers before certification for operation of 140 T Cranes. It was decided that the possibility of setting up a Simulator for Cranes be examined by RDSO. It was also decided that operator training shall continue as before at JMP and Parel Workshops till such time IRIMEE starts organize specific courses for crane drivers/operators. Operator certification can be done by Sr. DME/DME after giving hands on training to the operator at a crane site on individual Railways. |
| CME(O&C)/ER  
| CWM/Parel/CR  
| Shri D C Sharma | **Issue of Crane Working Manual:**  
|  | Shri DC Sharma, now Sr. DME/ALD/NR was entrusted with the responsibility of preparing a crane working manual for the Gottwald design crane in consultation with CME (O&C)/ER. CWM/Parel shall arrange preparation and issue of a crane-working manual for Cowans design cranes in consultations with CME(O&C)/CR. |
| All Railways | **CRS Sanction for 140 T Cranes:**  
|  | ER, NE, NF, SE, WR and SCR were asked to expedite obtaining of CRS sanction for operation of new Gottwald design cranes on the basis of speed certificate issued by RDSO. CR, SR, SC and WR were asked to expedite obtaining CRS sanction for operation of new Cowans cranes to be supplied during the year on the basis of interim speed certificate issued by RDSO.  
|  | All Railways were asked to obtain necessary CRS sanctions for operation of all types of 140 T Cranes available on IR to provide flexibility of operation. |
| ALL Railways  
| CME/ER, CR  
| CWM/JMP & Parel | **Consolidation of requirements of Maintenance Spares:**  
|  | It was decided that JMP workshop and Parel workshop shall be the nodal shops for consolidation of maintenance spares for Gottwald design and Cowans design cranes respectively. Keeping in view the need for ensuring near 100% availability and reliability of 140 T Breakdown Cranes, it was decided that vetted indents for their |
requirement of urgent maintenance spares (lists as finalized during the meeting) for new Gottwald type cranes by NR, ER, SE and SR shall be sent to JMP workshop for consolidation and purchase latest by first week of June 2000. The following breakup was decided for purchase of spares for cranes of new design:

<table>
<thead>
<tr>
<th>Railway</th>
<th>Complete List</th>
<th>Curtailed List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Railway</td>
<td>One set</td>
<td>One Set</td>
</tr>
<tr>
<td>North Eastern Railway</td>
<td>One set</td>
<td>Nil</td>
</tr>
<tr>
<td>N.F.Railway</td>
<td>Nil</td>
<td>One set</td>
</tr>
<tr>
<td>Western Railway</td>
<td>Nil</td>
<td>One Set</td>
</tr>
<tr>
<td>Eastern Railway</td>
<td>Nil</td>
<td>One set</td>
</tr>
<tr>
<td>South Central Rly.</td>
<td>Nil</td>
<td>One set</td>
</tr>
<tr>
<td>South Eastern Rly.</td>
<td>One set</td>
<td>Nil</td>
</tr>
</tbody>
</table>

ER shall, thereafter, expedite procurement so that there is no holdup as finalization of Rate Contract for all the imported spares for Gottwald design cranes on lines similar to Cowans cranes by Railway Board would take some more time.

It was decided that adequate number of wheel sets must also be provided as maintenance spares for the old and new cranes. Necessary planning for this purpose should be done by JMP and Parel Workshops and confirmation sent to Board’s office. The spare wheel sets will be held by JMP Parel workshops.

Railway needing wheel sets for replacing the condemned wheel sets will arrange collecting the same from respective shops and return the condemned wheel sets for rediscing.

Jamalpur workshop has circulated a list of capital spares to be stocked by Railways to ensure higher availability of cranes. To economize and with a view to take advantage of quality of scale, it
was decided that Jamalpurt workshop shall draw a consolidated list of capital spares required for Gottwald Cranes both old and new design. Only JMP Workshop shall stock these spares for all the Railways deploying Gottwald cranes and supply as when required by any Railway. Similar action would be taken by Parel Workshop of CR for Cowans cranes. ER & CR should furnish consolidated proposals for sanction of capital spares under RSP.

Funds provided under RSP against capital spares for 140 T Cranes must be fully utilized by ER during the year.

<table>
<thead>
<tr>
<th>EDRS (P)/Rly. Bd.</th>
<th>Rate Contract for Maintenance Spares:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamalpur workshop has finalized a list of maintenance spares for Gottwald design cranes of Rate Contract similar to one for Cowans cranes. This excludes the items already indigenized successfully. Stores Directorate should expedite finalization of Rate Contract.</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>CME/ER CWM/JMP EDRS(P)/Rly. Bd.</th>
<th>Manufacturing Programme of 140 T Cranes at JMP:</th>
</tr>
</thead>
<tbody>
<tr>
<td>JMP has manufactured 3 nos. 140 T Cranes during 1999-2000. JMP Workshop must ask for commensurate amount of funds for manufacture of 140 T Cranes as per the production programme under WMS. Railways to whom the cranes are allotted may accept the debits against relevant RSP provision of ER. JMP plans to manufacture 4 nos. 140 T cranes during 2000-2001. For this purpose, procurement of kits needs to be expedited by Railway Board.</td>
<td></td>
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<table>
<thead>
<tr>
<th>All Railways CWM/JMP &amp; Parel Dir./IRIMEE EDS(MP)/RDSO</th>
<th>Failure Reports of 140 T Cranes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>All failures of 140 T Cranes must be directly reported by user railways to RDSO, JMP Workshop, Parel workshop and IRIMEE as per the format at Annexure ‘A’. RDSO should prepare a system for codification of failures of 140 T Cranes in the next 3 months and start analyzing the failures as is being done in case of diesel locos.</td>
<td></td>
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</table>

| All Railways | In order to review the utilization of 140 T Cranes and availability of requisite maintenance infrastructure, Railways were asked to furnish information as per proforma at Annexure “B” and “C” to Board’s office, in hard copy as well as floppy, latest by 31st May, 2000. A copy should be sent by e-mail to dmep2@rb.railnet.gov.in with copy to edmtr@rb.railnet.gov.in. |

Compendium on Crane maintenance-Group meetings for Instructions on 140 T Cranes
<table>
<thead>
<tr>
<th>EDS (MP)/RDSO All Railways</th>
<th>The next Crane Maintenance Group Meeting shall be held at Parel Workshop on Central Railway. Motive Power Dte of RDSO shall be the nodal agency for preparation of Agenda for all future Crane Maintenance Group Meetings and for monitoring action taken on decisions taken during the Group’s deliberations.</th>
</tr>
</thead>
</table>
| All Railways              | **Feeder Cadre for Crane Maintenance & Operations:**  
Different Railways have been following different practices for induction of manpower for operation and maintenance of cranes. It was decided that all new induction for operation and maintenance staff for 120/140 T cranes should be drawn from Diesel Sheds with a view to provide necessary expertise and avenue for promotion so that there is no stagnation. |
| EDME(Tr.)                 | **Gazette Supervision for Crane operation and Maintenance:**  
Railways should provide Gazetted level supervision at all 120T/140 T crane sites. Railways requested for sanction of an officer, preferably Sr. Scale, exclusively for looking after the operation and maintenance of sophisticated high capacity (140T) cranes. This will be examined by Railway Board. |
| All Railways CWM/JMP      | **Approval vendor Lists:**  
Approved vendor’s lists for maintenance spares of 140 T cranes shall be circulated periodically by JMP and Parel workshops.  
Jamalpur Workshop has provided a draft copy of the vendor’s list of the old crane. Vendor list for the items of new crane would be prepared in due course. However, as the equipment used on the cranes is similar the vendor list covers most of the equipment of the crane as well. Comments on the performance of vendors included in the list must be sent to JMP Workshop within a month for modification of the list. JMP Workshop must then re-circulate the final copy of the vendor’s list.  
Periodic vendor meets shall be organized by ER and CR in which all Railways should participate. |
| **CWM/JMP CWM/Parel** | **DO’s and DONs for Crane Operation:**
List of Dos and DONTs for old cranes should be installed by Jamalpur and ‘circulated to all Railways’. Similarly for Cowans Cranes Parel Workshops shall prepare the Dos and DONTs. |
| **CWM/JMP EDS(MP)/RDSO** | **Quality audits of Crane Manufacture:**
It was decided that stage inspection by RDSO is no longer required and should be discontinued as it has been done in the PUs. In place of this periodical quality audit of the systems at Jamalpur should be carried out by RDSO. |
| **All Railways** | **Crane Utilisation for purposes other than breakdown:**
It was decided that crane for activities other than accident relief cases must be controlled. This is very costly asset and its proper upkeep for breakdown relief operation is necessary. |
| **CWM/JMP** | **Pendulum Type Angle Indicator:**
Jamalpur Workshop was asked to provide pendulum type angle indicator in all cranes manufactured henceforth. |

(KL Chhabra)
Executive Director (Dev)
Railway Board

**Copy to:**
CMEs/All Zonal Railways, Director/IRIMEE/JMP
EDS(MP)/RDSO
CWM/JMP/ER &
CWM/Parel/CR
ED(Trg. & MPP)/Railway Board
EDRS(P)/Railway Board
EDME(Tr.)/Rly. Board
JDTC(G)/Rly. Board

**Encls:**
Annexure ‘A’
Annexure ‘B’
Annexure ‘C’

Compendium on Crane maintenance-Group meetings for Instructions on 140 T Cranes
### ANNEXURE - A

**REPORTING FORMAT FOR DEFECTS OF 140 T CRANE**

| Date : …… | Incharge of Operation : ……………………… Division…………………… (Sr. DME/DME) |
| Reporting Railway ……… |
| Location of Crane ………. | Incharge of Maintenance ………………… Division ………………… (Sr. DME/DME) |
| Crane Type …………… (Jes sop/Gottwald (old)/Gottwald(New)/Cowans (New/JMP Manufactured) |

<table>
<thead>
<tr>
<th>S.No</th>
<th>Description of Defect Describing the operation When Defect was observed</th>
<th>Date of Defect</th>
<th>Last Schedule Particulars</th>
<th>Action Taken to Repair &amp; Date of Putting Back into service</th>
<th>Improvement in Design/Manufacturing/Maintenance/ Quality of Material needed</th>
<th>Remarks</th>
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(Signature of Sr. DME/DME/AME)

**Address:**

**Note:**
- Report to be signed by an officer only.
- Report to be sent within 10 days of occurrence of defect to DG(MP)/RDSO, lucknow, CWM/Jamalpur/ER
- Respective failures should be highlighted.

Compendium on Crane maintenance-Group meetings for Instructions on 140 T Cranes
### ANNEXURE-B

**EXISTING/PROPOSED 140 T CRANE LOCATIONS: AVAILABILITY OF MAINTENANCE INFRASTRUCTURE**

**RAILWAY:**

<table>
<thead>
<tr>
<th>Location</th>
<th>Month/Year of commissioning</th>
<th>Month/year of last POH</th>
<th>Availability of Crane Stabling facility</th>
<th>No. of Supervisors &amp; staff provided for operation*</th>
<th>Availability of Trained operator, Maintenance staff</th>
<th>Availability of 2 sets of Crew</th>
<th>Lever of Gazetted Supervision available</th>
<th>Diesel Shed nominated for maintenance</th>
<th>Distance of location from nominate Diesel Shed</th>
<th>Cutoff date for Diesel cadre as feeder cadre for Crane Gangs</th>
</tr>
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<tbody>
<tr>
<td>Existing/Proposed</td>
<td>Yes/No</td>
<td>Yes/No</td>
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Give designation of highest level supervisor available in case Gazetted supervision is not there.
### ANNEXURE-C

**EXISTING/PROPOSED 140 T CRANE LOCATIONS: AVAILABILITY OF MAINTENANCE INFRASTRUCTURE**

**RAILWAY:**

<table>
<thead>
<tr>
<th>Location</th>
<th>Capacity of existing crane</th>
<th>Section wise Beat</th>
<th>Sectional Distance (Kms)</th>
<th>Ruling Gradient</th>
<th>Max Ruling Curve</th>
<th>Sectional Speed Availability of 2 sets of Crew</th>
<th>Single line/Doubler Line</th>
<th>Traffic Density on Section No. of Trains/day</th>
<th>Frequency of use</th>
<th>Frequency of use</th>
<th>Nearest 140 T Crane &amp; Distance</th>
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</table>

**Compendium on Crane maintenance-Group meetings for Instructions on 140 T Cranes**
2.0 Minutes of CMPE(R&L)s’ Conference held on 1\textsuperscript{st} and 2\textsuperscript{nd} July, 2002 at Chennai

A. Crew Management

1. Train dynamics:

Train of running staff in Train Dynamics to improve their driving skill is a major thrust area of Mechanical Department. The syllabus for training of drivers in train dynamics has already been circulated to Railways vide Board’s letter no. 93/M(L)/467/12 dt. 15.2.2001. The training material of Train Dynamics is presently under preparation by a team of Loco inspector’s from Southern and Western Railway and will be circulated to the Railways by the end of July 2002.

In the first phase, trainers from Zonal Railways (inspectors/instructors) will be trained on Southern and Western Railways. The target date for completing the training of trainers is Nov., 2002.

In the second phase, Railways should start training of drivers as soon as trained instructors/Loco Inspectors start becoming available. The target date for completing crash course on Train Dynamics for drivers is 31\textsuperscript{st} March 2003.

2. Surprise breathalyzer test for drivers:

The progress in respect of carrying out surprise breathalyzer test of running staff on Zonal Railways has been unsatisfactory. Railways should particularly target known addicts whose list should be available with Power Engineers, Safety officers and Loco Inspectors. Surprise breathalyzer test for such staff should be conducted frequently, a few hours after signing on.

\textit{Zonal Railways should advise action taken in this regard latest by 31.7.2002.}

3. Computerized Crew Management System:

Southern Railways has successfully implemented computerized Crew Management System at Erode two months back with the following advantages:

- Covers all functions of crew booking.
- Monitoring of availability of crew to prevent detention.
- Ensuring optimum utilization of crew to prevent under rest as well as control of overtime.
- Monitoring of drivers falling due refresher course, PME etc.
- Aid crew balancing across divisions and depots.
- Computerization of record keeping of CTRs.
In view of the obvious advantages, it was decided that all crew lobbies should have provision of necessary hardware and software for implementation of the Crew Management System module. SR shall circulate details of the hardware required for the purpose. Once the software developed by SR has stabilized, it shall be implemented on other Railways. In the meantime, Railways should continue their effort at local level to computerize crew lobbies. The progress in this regard should be reported through CME’s monthly PCDO to Board.

Each railway should ensure computerization of at least one crew lobby per division by March, 2003.

4. Running staff per driving unit:

Based upon the information furnished by Railways, it is seen that on the basis of on-roll position. ER (10.7), CR (10.3), NR(9.3) and SER (9.1) have crew strength (drivers + assistants) higher than the IR average (8.9). These Railways should undertake a critical review of the running staff strength per driving unit and take action to bring it down.

In order to have uniformity in the methodology for working out crew requirement. It was decided that a Committee consisting of CMPE/R&L/SCR & Dy. CME/F&P/CR should recommend common norms for all Railways. All Railways should send their views to C.Rly. by 15.7.2002 and the report of the Committee should be finalized by 31.8.2002.

Railways should achieve a reduction of 15% in sanctioned strength by Dec. 2002 and 5% in on-roll crew strength per driving unit by March, 2003.

5. Rationalization of distance Crew booking lobbies

Not much progress has been made in this regard. Railways should undertake a fresh round of critical review of lobbies and indicate their action plan 31st July.

Details of year-wise closure of crew booking lobbies for the period 1997-98 to 2001-02 and the action plan for closure of lobbies during 2002-03 may be sent for the information of the Board.

6. Drivers over due refresher course

It was reiterated during the meeting that Board’s instructions contained in letter no. 2000/Safety/A&R/19/40 dt. 19.12.2000 are very clear.

Railways should not permit any running staff overdue refresher course on footplate duty.
7. Accidents on crew account:
From the data furnished by Zonal Railways for the last 5 years, it is seen that cases of drivers over-shooting signal at danger are high on SE, NF and ER. Railways should analyze the reasons and take steps to improve the situation.

It was also decided that –
- Sample checks of speedometer chart rolls for drivers prone to over-speeding must be regularly carried out.
- Railways should introduce monitoring for whistling by driver at level crossings by installing video cameras at such locations. The location of video camera may be changed from time to time to bring in an element of surprise.

8. Shunting staff (Review item)
It was pointed out no serious efforts has been made by Railways to reduce sanctioned/on roll strength of shunters. Railways should drastically reduce the number of shunters as advised by the Board earlier.

*It was decided that each Railway should undertake a special review of shunters in the next 3 months and posts surrendered should be advised to the Board.*

9. Training of staff on Simulator
Full use must be made of the simulators at TKD and KGP, while NR confirmed that the simulator at TKD was being operated in all 3 shifts. SER was not operating it in all 3 shifts.

It was decided that training of inspectors of all zonal railways, on simulator should be completed by 31.12.2002 and all drivers of NR and SER by March 2003.

10. Condition of running rooms
Zonal Railways were advised to act upon the guidelines arising out of the report of the “Committee on standardization of facilities in running rooms on Indian Railways” circulated vide Board’s letter 96/M(L)/467/Misc dated 27.10.2000.

Zonal Railways confirmed that action has been taken to improve the condition of running rooms in a phased manner by nominating one running room per division every year for improvement.

*Railways should furnish their action plan for the next 2 years for information of the Board (MM).*
B. Fuel Management

1. Rationalization of fuelling pattern

The revised fuelling pattern has already been implemented by Railways on most of the fuelling installations, as a result of which, substantial annual savings on a recurring basis have been achieved. With dismantling of APM, prices are likely to change every fortnight. There will also be price variation from place to place – the prices being lower at and near the port. Some of the State Governments have also imposed Entry tax on HSD oil. There is, therefore, an urgent need for Railways to work out the price of HSD at each fuelling installation every fortnight and suitably fine-tune their fuelling pattern with in the Railway as well as at interchange points.

Following decisions were taken in this regard:

- RDI wise HSD price as payable by the Railways for a month should be faxed to the Board by 5th of the following month.
- Railways should monitor the %age of HSD on volume basis on which 4% CST is applicable. This information should also be relayed to the Board on a monthly basis.
- Railways should achieve a reduction of 3-5% in the average HSD price within one month through rationalization of fuelling pattern.
- Railways should not pay Entry Tax imposed by the State Governments, except where there is a Court judgement.

2. Software for rationalization fuelling pattern:

S.Rly has developed a software for computerized working out of the train-wise rationalized fuelling pattern which gives better optimized results much faster as compared to the manual system. This is a commendable initiative. The software is, however, on Oracle and it would be difficult as well as costly for the Railways to use it. It was, therefore, decided that SR should prepare the software on MS Acess platform.

It was further decided that SR would give copies of the software and also undertake training of 2 persons from each of the Zonal Railways as soon as the software is ready. This should be organized not later than 31st August 2002. Railways were also advised to bring their own data which could be loaded and results demonstrated as part of the training.
3. Review of fuelling installations with less than 10 KL off-take

Zonal Railways confirmed that a review has been made by them and wherever found feasible, installations with less than 10 KL off-take have been closed down. (List enclosed as Annexure-A).

4. Periodic calibration/cleaning of HSD oil tanks

Railway indicated that calibration of HSD tanks was a tedious process while cleaning had the associated problem of disposal of sludge. It was decided that Railway Board would issue suitable guidelines in this regard in consultation with the oil companies.

Railways may send their experience/views in this regard to Board.

5. Computerization of documentation in RCDs.

During the last CMPE(R&L)s conference, it was decided that all Railways would implement Windows based software developed by S.C. Railway. While some Railways are yet to collect the software from SCR, other Railways expressed their inability to use it for want of installation key to be provided by the supplier.

S.C. Railway confirmed that the installation key was available with them now. All Railways should collect the software as well as the installation key.

All Railways including S.C.Rly. should confirm implementation on all RDIs on their system by 30.9.2002.

C. Disaster Management

1. Report on reorganization of ARTs

The Committee for re-organization of ARTs made a presentation incorporating feedback on their report from some of the Railways.

Most of the railways, however, had not yet given their views to the Committee or the Board.

All railways to ensure that their views are communicated before July 31, 2002 to the Committee with a copy to Board. The committee should also work out the benefits (quantified in money value, as far as possible) that is expected if the proposed investments are made.
2. Training of field supervisors and staff

To assist the shed in training of supervisors and staff, both PL and JMP shops have conducted training courses in the past.

Most Railways expressed satisfaction about the adequacy of training provided by the shops. WR indicated that training content was, perhaps, too theoretical.

SLI was identified as the only weak area where assistance from shops was required.

JMP workshops have succeeded in obtaining components for SLI from indigenous sources, thus reducing the cost of cards by as much as 70% PL shop should do likewise.

Both workshops shall organize training in maintenance of SLI before September 30, 2002.

JMP will assist the railways in attending to all defective SLIs on Gottwald cranes.

3. Selection and training of crane driver

The selection and training of crane drivers was discussed. It was decided that crane drivers may be allowed to rise up to the grade of Master Craftsman, for which railways should take action on their own.

The crane driver must be handpicked by the Branch Officer based on suitability and experience.

The following stations were nominated for special training of crane drivers:

Delhi – Gottwald cranes
Itarsi - Cowans Shedon cranes

For the first year of this training, it was decided that the crane drivers shall be given Certificate of Competence by the Sr. DME/DME in-charge of this training. In one year, all Railways to ensure that the Divisional Officers in-charge of the Breakdown are also trained in operation of these cranes, if required.

After one year, the system of granting Certificate of competence by the Sr. DME/DME in-charge of the Division shall be restored.
IRIMEE to organize training of officers for both Gottwald and Cowans Sheldom cranes.

4. Functioning of the Service Improvement Groups (SIG)

PL and JMP workshops provided details about the activities of their Service Improvement Groups. NE, NF and SC stated that the SIG’s had not visited their system.

Dy CME/JMP confirmed that visits of SIG would be organized (starting July 2002) to those locations that have been allotted new cranes. For the old design of cranes, SIG shall commence visits again in the next year.

5. Preventive maintenance of cranes

One Gottwald crane on SER is overdue POH.

DyCME/JMP indicated that they had examined the crane and would take it up for POH as soon as they were able to accept the crane. In the opinion of JMP workshop, the crane was fit to be used in the meantime.

CWM/JMP to organize POH of crane running overdue on SER

The observations of RDSO were that maintenance of cranes was not being carried out strictly as prescribed. For instance it had been observed in one case that

a) Match truck spring had gone home and
b) Filters had not been changed in 6 months

Dy. CME/JMP stated that the problem of spring was due to poor quality:

It was decided that henceforth only JMP shall supply spring for Gottwald cranes to all railways. They may place indents on JMP to cover current requirement.

CWM/PL based on feedback from the Service Improvement Groups, also indicated that the required maintenance was not being done on Open Line. This can have serious consequences for the operational readiness and increased cost of maintenance due to defects not being rectified in time.

Railways to organize check to ensure that the laid down maintenance schedules are being followed and that their records are available with the ARTs, as prescribed. Results of these checks may be sent to Board.

The Jib of LKO based Gottwald crane has developed permanent set.
6. Adoption of maintenance system based on hours of use

The periodicity of maintenance of cranes and its implications were discussed in detail.

*It was decided that the POH of cranes should be continued at an interval of eight years, as prescribed at present.*

*If any extensions become necessary, they should be granted only by the CWM of the concerned POH shops. Such extensions should only be for one year at a time and shall not exceed two years. The extension may be permitted after careful assessment of usage of crane and its condition by the workshops.*

7. Availability of infrastructure, tools and spares

Railways confirmed availability of tools, consumables and maintenance spares. The unit exchange assemblies are available with JMP and PL shops for their respective cranes.

The following infrastructure is also required:

a) For stabling: shed, if possible  
b) Maintenance: only in covered shed

Railways to confirm availability of infrastructure as indicated above to the Board.

8. Problems in maintenance of Cowans-Sheldon and Gottwald cranes

Railways indicated the need for training of staff in maintenance of crane engine.

*RDSO to organize training on Cummins Engine within two months. This may be clubbed with training for DMU engine maintenance staff.*

Railways may nominate 1-2 persons per crane.

9. Hydraulic re-railing equipment

Railways confirmed that action had been taken to cover the requirement of SP-ARTs also. Either the equipment in place or indents have been forwarded to COFMOW.
10. Hydraulic Rescue Device

Railways indicated that there was a need to replace some older sets of rescue devices. Details were, however, not available.

Recently, the specifications for hydraulic rescue devices have been upgraded to include combi-tools air bags etc.

*CMPE (R&L)’s may review their requirements by August 31, 2002 and communicate the same to the Board. These requirements should also be reflected in the preliminary M&P Programme for 2003-2004.*

11. Purchase of spare parts for critical equipment

Railways expressed difficulty in obtaining spares of requisite quality.

*It was decided that COFMOW shall finalize a rate contract for HRD and HRE spares. Railways may then obtain their requirements directly from the vendors with whom the rate contracts are finalized.*

12 Bulking of crane spares

Most railways had not yet finalized their requirement of spares for the cranes.

*The requirements may now the finalize by August 31 and communicated to the two concerned shops.*

MM especially emphasized that following points in his closing remarks :

- Railways to send comments on the Khosla-Trivedi Committee for Re-organization of ARTs on priority.
- The ARTs must be self-sufficient to look after the needs of its staff, who sometimes have to work for days together. Basic facilities such as tents and chairs must be provided in all ARTs.
- All ART in-charges to ensure that sufficient food is available to feed the breakdown staff and tea and biscuits should be provided to them at regular intervals.
- It is necessary to provide for easy identification of ART/ARMV staff. They should be provided distinctive bright colour jackets or helmets.
- The commander, who is to direct the activities of his staff, should also be easily identifiable at work site. Without such identification, the work suffers because every person tries to give instructions. In case of conflicting command, there could be a serious accident.
- Within one month, each railway to achieve :
- 110 kmph maximum speed for at least one ARME
- 100 kmph maximum speed for one ART, by upgrading wagon stock to high-speed design.
- The ART staff should be scanned and non-performers weeded out.
- Mock trials should be conducted with timed response.
- COFMOW to finalize the case for purchase of re-railing equipment.
- ART and crane locations may be reviewed by each railway. Remove what is not really required.
- Crane drivers’ course to be started at Itarsi and New Delhi.
- JMP to organize training for officers on 140 T crane including the probationers.

D. Miscellaneous

1. CRS sanction

It was decided that all Railways must obtain CRS sanction for new type of locos by December, 2002.

2. Management by Objectives

MM stressed on the importance of Management by Objectives. A sheet indicating the objectives for CMPE(R&L)s for 2002-03 was circulated. A copy of the same has been separately sent to CMEs by MM.

List of RDIs with less than 10 KLS off-take closed by Railways

<table>
<thead>
<tr>
<th>Railway</th>
<th>Installation closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>Trombay, Chalisfgaon, Kalyan Diesel shed, Gwalior (Departmental fuelling point)</td>
</tr>
<tr>
<td></td>
<td>Bhusawal GC-16, Miraj (NG), Gwalior (NG), Wadi Bunder</td>
</tr>
<tr>
<td>NR</td>
<td>Chunar, Jalandhar</td>
</tr>
<tr>
<td>SR</td>
<td>Virudhnagar, Manamadurai (MG), Jolarpettai</td>
</tr>
<tr>
<td>SCR</td>
<td>Pakala, Nizamabad</td>
</tr>
</tbody>
</table>
3.0 Minutes of 3rd Crane Maintenance Group Meeting held at Jamalpur on September 23 & 24, 2004

1. Review of 2nd CRMG held at Chennai on 1st and 2nd July 2002

Para (C) 5 – Preventive maintenance of cranes in open line.

In some Railways maintenance of 140 T BD crane is done by the nearest diesel shed. This has resulted in dilution of responsibility for maintenance between open line and diesel shed. Railways should nominate one Junior Scale officer as the officer-in-charge of crane to ensure complete accountability of the general health of crane and its spares procurement directly or through Jamalpur.

The crane should not be parked under OHE to ensure proper maintenance of the crane. Wherever possible a covered shed should be provided. At locations where thefts from BD crane are likely the covered shed should be provided with collapsible gates.

Railways should create facility for conducting weekly drill should consist of simulating the crane use at accident sites. This facility should also be used for imparting training to the user during pre commissioning.

Mock drill of the crane operation should be conducted at regular interval.

All CMEs and officers of HQ/Divisions must check the maintenance schedule forms being filled up by the maintenance team to check the effectiveness of the maintenance.

The officer and supervisor in charge should be provided with mobile phones with built in high resolution camera to ensure multimedia connectivity with Jamalpur/Parel. Mobile gang of Jamalpur and Parel should also have similar phones with camera (8 for Jamalpur and 4 for Parel) to ensure quick appreciation of field problems and their trouble shooting.

CR confirmed that supervisors and staff of Parel Workshop are checking that schedules are being carried out and form filled while visiting crane depots.

Para (C) 7- Availability of infrastructure, tools & spares.

RDSO has circulated a drawing RDSO SK: No. CR-833 for the shed to be constructed in division for crane maintenance. RDSO should also circulate the
infrastructure required for basing 140 T cranes in division, covering stabling facilities, Pit, covered shed, battery charging facility, storage area for lifting tackles, material handling facilities and tools etc.

Para (C ) 12 – Bulking of crane spares/Rate contract.

Jamalpur gave the current position of materials received against vetted indents received from zonal railways in 2001-02 (151 items for old design crane and 69 items for new design crane). Railways should collect it from Jamalpur. Some of the items from 151/69 items list were not necessarily required as such they have not been purchased.

Railway Board finalized rate contract for critical hydraulic and pneumatic items in May/June 2003. Railways may send the vetted indent for these items as circulated by CME/ER/CCC in his letter dated 24.06.04. The letter and the list is available on Jamalpur’s website.

CR informed that Rate Contract for spares for 12 nos. of 140 T old design Cowans Shedon cranes was placed on 22.03.04 which is yet to materialize pending Railway Board’s clearance regarding obsolescence of some items.

Rate Contrcat for 4 nos new design Cowans Sheldon cranes is yet to be floated. CR informed that warranty of 3 cranes have already expired.

2. New Items

1. Maintenance problems reported by Railways

Engine, Hydraulic System, pneumatic system, SLI etc. Review of the need for the axle mounted compressor in future in view of air brake conversion of ART’s.

Railways sent the nature of problems faced in crane in above systems. The problems were compiled by Jamalpur and discussed in the meeting. Some of the dicisions taken are as follows :

a) Axle/Bogie mounted Compressor.

NF, ER and WR have not converted all the ART’s to air brake.
Axle/Bogie mounted compressor will be removed from the crane by the divisions where ART has been converted to air brake.

RDSO should study the feasibility of fitting auxiliary engine mounted compressor in Gottwald cranes similar to that fitted in the Cowans crane.
Jamalpur will not fit bogie mounted compressors in the new design crane manufacture from the next lot of 12 cranes.

b) **Boom head crack of new design crane.**

From the 8 cranes supplied by Gottwald in 1997, boom head of 3 cranes (Gonad, Ratlam, and Delhi) have already cracked and have been replaced.

Jamalpur should contact M/s Gottwald for replacement of booms in balance 5 cranes imported in 1997 under warranty.

c) **Splindled shaft breakage of Q6+Q7 pump.**

Jamalpur to find the alternative design of pump in consultation with M/s Rexroth. For the time being the crane user should send vetted indents for the shaft, seal, coupling and bearing to Jamalpur for procurement. The detail of these items was given during the meeting.

d) **70 T single leg wire rope sling – wrong dimension of oblong link.**

Every Railway informed that this sling is not used. It was decided that use of this sling should be deleted from the standard list of slings to be supplied during manufacture of new cranes. Railways who are using this sling and facing the problem due to the oblong link size may get the oblong link replaced by the sling manufacturer for which detail was given by Jamalpur during the meeting.

e) **Chain Slings – Breakage and use with Main Hook.**

Some railways have reported breakage of chain slings. Jamalpur has revised the drawing. All new purchase should be as per the revised drawings and from approved sources.

Many Railways have reported that the chain slings cannot be used with main hook due to smaller size oblong link. The chain slings are not recommended for use with main hook as the maximum capacity of the chain slings is 25 T.

f) **Groove formation in A frame by Derrick wire rope.**

Due to shortening of A frame in old design crane by 400 mm this problem has arisen. Railways should enlarge the size of groove in A frame if the wire is still touching the A frame (careful gas cutting and grinding).
g) **Failure of engine items viz magazine switch, regulator, hour cum rpm meter etc.**

Railway should enter into AMC with Cummins. Till such time AMC is finalized, low value and failure prone items may be stocked by crane users. Purchase should be only from Cummins authorized dealer as per Cummins part number. Since there are different designs of engines fitted in the crane, the ordering should be done after consultation with the nearest authorized dealer of Cummins. For the engine related problem Railways should contact the nearest Cummins dealer.

h) **Leakages due to failure of Hose assemblies**

New purchase of hose assemblies should be done as per the specification circulated by Jamalpur and from approved source. Maintenance should be improved to prevent the failure of hose due to rubbing.

i) **Leakage from pipeline joints**

New purchase of pipe and fittings should be done as per the approved brand and makes as circulated in Crane CD version Mar. 04.

j) **Failure of seal kit of hydraulic cylinders.**

The standard seal kits and its make/brand have been incorporated in the drawings. The vendors for hydraulic cylinders (different vendors for different cylinders – refer Jamalpur Specification No. JMP/140 T/GOTT/SPEC/15) have also been approved. Seal kits should be purchased only from the approved vendor for the hydraulic cylinder.

k) **Failure of coil springs and Disc Springs.**

Railways should take coil spring only from Jamalpur. The disc spring should be purchased only from approved vendor (M/s Gala Springs, Mumbai).

l) **Failure of limit switch**

Limit switch should be purchased only of imported make. Limit switch of new design crane can be used in old design crane also except for recovery winch which is not critical. The detail of the limit switch of imported make was given by Jamalpur during the meeting.

m) **Failure of components of SLI system.**

Railways should finalize AMC for SLI system with any of the three approved vendors. Staff should be trained for attending to minor repairs/loose connections and
for detecting the defective components M/s Amrita Lakshmi and M/s Mechanical Systems are ready to provide training at Hyderabad/Pune respectively.

n) Requirement of filters for Imported Cummins engines.

The filters should be indigenized in consultation with M/s Cummins. This may need change of the filter casing also increasing the initial cost. But in the long run it will work out to be cheaper as the imported filter elements are costly.

o) Engine starting problems.

Most of the problems of engine not starting have been due to problem in fuel system, lub oil system or battery. Railways should ensure proper maintenance system like use of lubricating oil, change of lub oil, change of filters, cleaning fuel lines regularly, checking of battery and keeping it in fully charged condition.

p) Failure of pneumatic brake system and sticking of pneumatic valves like brake cylinders, parking brake not working, DC valves, indicators, relay valves etc.

Most of the problems are related to the dirt and moisture in the pneumatic systems. Railways should ensure proper cleaning of filters in the pneumatic system.

RDSO should examine the possibility of fitting air drier in pneumatic system within 3 months.

RDSO should also revise the maintenance schedule of old new design crane and make the attention to pneumatic system uniform.

q) Defects in SIM121F, NG12, solenoid valves and other hydraulic components.

Most of the problems are related to the dirty oil. Gottwald’s recommendation and the RDSO’s recommendation in the maintenance schedule have some discrepancies, which have been referred to RDSO vide Jamalpur letter no. F/DC/OFFICE/03/62 dt. 14.06.04. RDSO should study the discrepancies and include it in the revised maintenance schedule.

In the maintenance schedule of the new design crane RDSO has mentioned a separate instruction bulletin no. MP.IB.HY.01.18.01 (Rev:0.00) for filling of oil in the crane. RDSO should modify this filtration unit so that it can be mounted on the crane and made a part of it.

Jamalpur and Parel should buy a oil testing equipment so that the cleanliness of the oil from the crane can be checked at an interval of 6 months to start with.

r) Twisting of counter gallows frame.

The problem has been reported by most of the users of old design crane. The problem occurs due to wrong operation at the time of derigging. To prevent the twisting it
should be fastened in a balanced manner. The staff should be trained not to use short cut of securing one of the slings provided for breaking. A frame foldable joint.

s) Wire ropes getting down from pulleys.

Frequent cases are taking place, especially in the divisions where new cranes have been commissioned, where either the wire ropes come out of the pulley or it entangles in the rope drum. Both problems occur due to wrong operation or the staff not being vigilant rope winding on the drum.

Railways should train their staff to avoid lateral pull and dragging to prevent ropes coming out from the pulley. Wire rope reeeving on drum should be under constant watch during raising the main and aux hoist and jib derrickup. Proper maintenance of rope tensioning device should also be ensured.

t) Maintenance of hydraulic brake cylinders

It was decided to continue with existing hydraulic brake cylinder designs in the old design Gottwald crane Nos 142032 to 142043 and 143001 to 143002. Jamalpur may however convert one or two cranes during POH to generate the spare pool of the obsolete brake cylinders.

u) Heavy wire rope slings.

Jamalpur should procure one crane set of polyester slings and conduct trial at Jamalpur.

v) High speed vibrations

ECOR reported heavy vibrations in the crane at 100 kmph. RDSO should examine the issue.

w) Self starting of the auxiliary engine

It was decided to continue with manual starting system of the auxiliary engine in the old design crane. Instead the new design cranes should also be occasionally tested for manual starting.

x) Testing of wire ropes slings.

RDSO to include the wire rope and sling testing and lubrication schedule in the revised maintenance schedule.

(i). CR stated that old design Cowans Shedon cranes are running with zero defects after POH including defects of Main Engine, since all reported defects till date have been attended.

(ii). The defects in new design Cowans Shedon Cranes could not be attended due to non-availability of the spares for 3 cranes whose warranty has expired.
2. Modification for high speed operation

Following cranes have been modified for high speed:

<table>
<thead>
<tr>
<th>Railways</th>
<th>Location</th>
<th>CRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECOR</td>
<td>Kanatamanjhi</td>
<td>143006</td>
</tr>
<tr>
<td>ECR</td>
<td>Dhanbad</td>
<td>142267</td>
</tr>
<tr>
<td>ECR</td>
<td>Danapur</td>
<td>143010</td>
</tr>
<tr>
<td>ER</td>
<td>Sealdah</td>
<td>143007</td>
</tr>
<tr>
<td>NER</td>
<td>Izzatnagar Gonda</td>
<td>142266</td>
</tr>
<tr>
<td>NR</td>
<td>Moradabad</td>
<td>143005</td>
</tr>
<tr>
<td>NR</td>
<td>Ferozpur</td>
<td>142040 (Ludhiana)</td>
</tr>
</tbody>
</table>

SER confirmed during the meeting that 143009 (BKSC) and Chakradharpur – 142272 has also been modified.

For the following cranes all the materials have been supplied. Railways should complete the modification by Oct 2004.

<table>
<thead>
<tr>
<th>Railways</th>
<th>Location</th>
<th>CRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCR</td>
<td>Allahabad</td>
<td>142270 (Kanpur)</td>
</tr>
<tr>
<td>NFR</td>
<td>NJP/Katihar</td>
<td>142269</td>
</tr>
<tr>
<td>NR</td>
<td>Delhi</td>
<td>142271</td>
</tr>
<tr>
<td>SWR</td>
<td>Hubli</td>
<td>142268</td>
</tr>
<tr>
<td>WR</td>
<td>Ratlam</td>
<td>142265</td>
</tr>
<tr>
<td>NR</td>
<td>Ambala</td>
<td>143008 (Bhatinda)</td>
</tr>
</tbody>
</table>

All new design cranes (144001 to 144011) under manufacture at Jamalpur are being turned out with high speed modification.

Rest of the 15 cranes are waiting for HS Casnub bogie. It was decided that RB will place order for 30 plus 6 (for manufacture) sets of the Casnub bogies immediately.

<table>
<thead>
<tr>
<th>Railways</th>
<th>Location</th>
<th>CRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECoR</td>
<td>Khurda Road</td>
<td>142034</td>
</tr>
<tr>
<td>ECR</td>
<td>Mugalsarai</td>
<td>142033</td>
</tr>
</tbody>
</table>
3. **AMC of cranes or their subsystem** :

To ensure that 140 T Cranes get full maintenance attention, railways may enter into AMC at those locations where railways find it difficult to do the maintenance work within in-house resources. Such AMC may be either comprehensive or only for specific sub-system (line engine or SLI). However, it must be ensured that AMCs are only with OEM’s or their agents specifically authorized to undertake such work.

CR stated that there was no response for AMC for SLI of old design crane. The existing system has been declared obsolete by the OEM.

4. **Staff for operation & maintenance of the cranes, including training and selection issues.**

As per decision in para 20 of first CRMG (April 2000) circulated vide RB’s letter number 2000/M(M&P)/175/1 dt. 16.05.00, it was decided that all new induction for operation and maintenance staff for 120/140 T cranes should be drawn from diesel sheds.

At least 16 staff should be trained for crane operation.

However, the areas where expertise of the crane is lacking are Hydraulics Electronics. Though IRIMEE is utilizing the facilities of ATI/Dasnagar for hydraulics training, it
is consider insufficient as no. of courses per year and nos. of participants per course is not sufficient to cover the Indian Railways requirement. This can be judged from the phenomenal response this course gets.

Railways should induct at least 2 supervisors and 2 technicians from hydraulic and electronic fields in the maintenance team of 140 T crane.

CR stated that adequate maintenance staff for 16 nos Cowans Sheldon Cranes has not been nominated by any depot. There is no staff with electronic background for maintenance of SLI.

5. Presentation by JMP regarding vendor development, specifications for spares/parts catalogue etc.

Adoption of PL numbers allotted by Jamalpur by all Railways.
Procurement of materials from approved vendors only.

PL number for about 2717 items allotted after approval by CME and COS/ER. This PL number should be used by all Railways for 140 T crane.

Jamalpur Specification for 17 groups of items issued, which contains guideline for procurement.

The approved Vendor Directory has been issued in Mar 2004.

Crane maintenance spare parts catalogue for old design crane was released by AM/ME. This will be circulated to all Railways within 3 months on hard as well as soft copies.
All the information except the material portion is also available on the Website at www.jmpper.com.
Three feature of the website should be utilized by the crane users to increase coordination with Jamalpur:

Crane User database – Names, Designations, Phone, Fax, e-mail numbers of the crane users are available. To facilitate the current position users should check the information and mail any changes if required.
Message board – can be used to create discussion subjects to share the experience between crane users.
Position of material – the stock position of critical items have been posted on the website. This will also contain the stock position of Railways. Railways should e-mail only the PL number and the nos. available in stock to Jamalpur to enable us to update it in the site. Subsequently whenever spares are consumed, the information should again be sent to Jamalpur.
6. Revision of Maintenance schedule issued by RDSO:

Railways pointed out certain discrepancies in the maintenance schedules issued by RDSO for old and new design crane. For example:

- No Schedule for bogie and undercarriage maintenance.
- Tightening of slewing ring nuts in 2Y schedule which is not possible.
- Schedule for hydraulic and pneumatic system in old and new design crane differs widely.
- No schedule for testing and lubrication of wire ropes and slings.
- Recommended oil/grease for different systems are large in number which needs unification. Jamalpur sent a proposal for this vide letter no. N/CR/59D/VOL-IV/90 dt. 12.10.02.

RDSO should modify the maintenance schedule after taking feedback from all Railways.

(Sunil Bajpai)  
Director/Mech.Engg.(P) II  
Railway Board

No.2004/M(M&P)/175/1/(CMG)  
New Delhi, dated November 2004

To, CMEs/all Indian Railways.

CWM/JMP/ER  
CWM/PR/CR  
EDS(MP)/RDSO  
CME/KRC
4.0 Minutes of meeting held on 29.06.2005 in Railway Board.

Subject: Review of 140 crane requirements on IR.

Present:
Shri B.L. Patil, CWM/PR/central Railway
Shri S.K. sood, CWM/JMP/Eastern Railway
Shri S.K. sinha, EDS(MP)/RDSO
Shri Nikhil Jain, CME/Parel/CR

Railway Board
Shri Sanjiv Handa, EDME (Tr.)
Shri Sunil Bajpai, DME (P) II

1. Requirement of cranes beyond the approved list of 73 locations, including telescopic boom cranes.

There are 73 ART locations for which 140 cranes have been approved in the past. These cranes have already been supplied or are planned for supply out of sanctions available in the Pink Book.

So far, 55 ART cranes are in service, including the one under despatch from JMP for Kurla.

In position, including one on KRCL 54
Under production in current series (JMP) 1
Sanction available for manufacture at JMP 12
(Item No. 7 ER/593 of 2005-06)
Sanction available for manufacture at PR 5
To be transferred to ER

Total 73

As a test case, the requirements of Northern Railway were taken up for discussion.

NR has been allotted 7 cranes out of 73 locations above (Full list at Annexe A). They have already been supplied with 6 cranes and one more is to be allotted out of future manufacture (for Pathankot)

However, this dose not meet the current requirements of NR, who also need cranes at following locations:
Standard 140 T cranes

Rosa
Firozpur
Prima-facie, these would be required if Railway has to meet the stipulated norms* (laid down in 1985) under present day conditions, whereby reserve line capacity has generally been consumed, thus impending timely deployment. Also, with the passage of time, yard layouts have becomes less accommodative of miscellaneous stock.

*These norms refer to the recommended beat of ART, which is 250-300 kms for BG and 150-200 kms for MG in each direction, subject to other recommendations.

These are required if the railway has to meet the norm of 90-120 minutes for arrival time of the crane everywhere on the network.

Telescopic boom cranes (2 Nos)

Katra
Badgaon
These cranes are required for a new section that has been opened, which is single line and has 97 tunnels. The cranes are, therefore required on either end of the section.

Because of the tunnels, it is preferable that these cranes be of telescopic design, which can work more easily than the standard fixed boom crane at the mouth of a tunnel, and more effective, inside it.

From the NR’s case it appears that there are still more requirements for 140 T cranes and the committee was of the view that the norm of 90-120 minutes for arrival of crane anywhere on the network should be adopted and the Railways asked to furnish their requirements, giving proper justification and after examining feasibility, to Board.

Telescopic design cranes should be considered for sections with lots of tunnels.

RDSO’s specification for telescopic boom crane was also discussed. It was recommended that RDSO should identify and specify makes of such common sub-systems as power source or brake systems, which do not curb the designer’s freedom to configure a crane, yet affords us the advantage of commonality with regard to manufacture and stocking of material, etc. While doing this, the generic nature of the specification should not be diluted.

The specification of the MG Crane may also be addressed likewise.

It was decided that a committee comprising Shri Qureshi, WM/PR and Shri A K Gupta, Dy CME (Diesel), ER should look into this aspect and submit its recommendations to RDSO.
2. **Review of codal life and the need for mid-life rehabilitation.**

The committee noted that the life prescribed for diesel cranes is only 20 years.

The committee recommends mid-life rehab after first POH (at 14 Years) so that the life of the crane can be increased to 26 years as follows:

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Time period</th>
<th>Cumulative life</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; POH</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Rehab</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; POH</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Condemn</td>
<td>6</td>
<td>26</td>
</tr>
</tbody>
</table>

This represents an increase of 23% in the prescribed life of the asset.

However, the breakdown crane is an asset that needs to perform without any glitches when required. For this to be possible, inputs shall be required during POH or rehab that need to be identified.

3. **Need for major assemblies required to be replaced during POH/Rehab**

For mid-life rehabilitation, every component or assembly except structural members such as the underframe or the boom itself are potential inputs.

RDSO and the shops must identify what percentage of each assembly is likely to be replaced during POH or Rehab, on the same pattern as DMW does for the diesel locomotives.

4. **Spare requirements to accommodate POH/Rehab requirements for maintaining 73 cranes in operation**

With the fleet getting older and larger, POH of cranes needs to be scheduled by the shops.

However, almost 5% of the fleet would remain in shop/transit for POH, rehab and other unplanned repairs. This requirement needs to be provided for because the territory serviced by a crane unprotected for long periods of up to three months during POH.

The committee considered the idea of keeping a spare pool with the shops so that a replacement crane can be sent whenever the regular one is under repairs. However, the committee favoured the idea that 5% extra cranes should be embedded in the system in such a way that Railways are able to provide the coverage to an unprotected territory without relocating the cranes dedicated to other territories.
(Saurabh Endley)
Director Mech. Engg. (P)II
Railway Board

No.2005/M(M&P)/7/2
New Delhi, dated 1 August, 2005.

Copy to:
1. CWM/Parel Workshop/Central Railway, Mumbai.
2. CWM/JMP Workshop/Eastern Railway, Jamalpur.
6. Workshop Manager/ Parel Workshop/ Central Railway, Mumbai.
## LOCATIONS OF PROPOSED 73 CRANES

<table>
<thead>
<tr>
<th>S R</th>
<th>LOCATION</th>
<th>LOCATION CODE</th>
<th>RAILWAY</th>
<th>SATAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ROHA</td>
<td>ROH</td>
<td>CR</td>
<td>MAHARASTRA</td>
</tr>
<tr>
<td>2</td>
<td>DAUND</td>
<td>DD</td>
<td>CR</td>
<td>MAHARASTRA</td>
</tr>
<tr>
<td>3</td>
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5.0 Minutes of meeting of Crane Committee held in Railway Board on 30th November, 2006

The following Members were present

1. Shri Nikhilesh Jain, CWE/NR
2. Shri K.B.L. Mittal, EDME (MP), Railway Board
3. Shri S.K.Sood, CWM/Jamalpur/ER
4. Shri B.L. Patil, CWM/Parel/CR
5. Shri N.S.R. Prasad, Director (MP)/RDSO
6. Shri Saurabh Endley, DME (P) II, Railway Board
7. Shri M.M. Querashi, WM/Parel/CR
8. Shri R.N. Haldar, Asstt. Design Engineer (MP)/RDSO

1. It was decided that the Mid-life rehabilitation (MLR) of 140 T cranes has to be started both at Parel and Jamalpur Workshops. The eight cranes of Gottwald design which have already been given second POH will not be given separate MLR but based on the work done on the POH and their condition, the enhancement of life of these cranes would be considered at the time when these cranes next become due for POH. For the balance cranes (12 nos at Parel Workshops and 12 nos at Jamalpur Workshop) mid-life rehabilitation will have to be planned with immediate effect during their next scheduled POH.

2. Parel Workshop has drawn up a list of items, which may require replacement during mid-life rehabilitation. Currently, this includes all items other than superstructure. However, this list would be pruned down and a final list of items to be replaced during MLR would be drawn up by Parel Workshop and Jamalpur Workshop and sent to Board by 08.12.2006 along with an approximate cost of MLR. Based on that RSP provisions for MLR of 140 T cranes would be drawn up and included in the RSP 2007-08.

3. Discussion was held regarding attention to be given to major assemblies during MLR. Decisions taken are given below:
   (i) **Main diesel engine**: The existing NT743 design of diesel engine fitted on Cowans Sheldon cranes is obsolete. CWM/PR to talk to M/s Cummins to either get these
engine overhauled under their Recon scheme or replaced by a suitable newer model.

(ii) **Auxiliary diesel engine**: The existing diesel engine model 1 YWA Mark-V of M/s Greaves is obsolete. However, since the utilization of this engine is less, the existing engines can be continued in service.

(iii) **Auxiliary Compressor**: Air compressor Broomwade Model No. AC 30/2030 is obsolete. Since utilization of this Compressor is less, the existing compressors can be continued in service.

(iv) **Distributor Valve**: The existing P-4 AG design of distributor valve is to be replaced by C3W design of distributor valve during MLR, as advised by RDSO.

(v) **Air brake equipment**: All equipment to be renewed for Cowans Sheldon design of cranes. For the Gottwald design, CWM/JMP to take feed back from his customers and draw-up a list of items to be replaced during MLR.

(vi) **Hydraulic Equipment**:

   a) Auxiliary pumps: Direction control valves, cross line relief valves, Motors, Rotary Column, Derrick Tie cylinders, Draw Beam of Jack cylinders to be replaced.

   b) Main Pumps: The old design A4U pumps has been replaced by A4 VG pumps by the OEM M/s Rexroth, New design HE-2 pump (02 nos per crane) being supplied by OEM are larger in size and it is not possible to fit two such pumps in tandem due to space constraints. Therefore, only one new HE 2 pump can be fitted along with the old design pump. CWM/Parel to ask M/s Rexroth if reconditioning of the old pumps is possible.

(vii) **Electrical equipment**: Relays, switches, motors and gauges etc. to be replaced.

(viii) **Safe Load indicator (SLI)**: The pad system of SLI should be 100% replaced. All imported SLIs to be converted to indigenous system, if not already done so. An indigenous design is already available for Gottwald design cranes. CWM/Parel to talk OEM of the indigenous version of making a suitable design for the Cowans Sheldon make of cranes also.

(ix) **Slew Ring, Bolts and nuts**: To be changed on condition basis.

(x) **Pulleys**: 100% to be replaced during MLR.

(xi) **Gear Boxes**: Gear boxes should be overhauled using repair kits from the OEMs.

(xii) **Relieving Bogies Lateral Dampers**: To be replaced.
(xiii) **Relieving Bogie Yokes**: To be replaced on condition basis.

(xiv) **Wire Rope slings**: To be replaced by a lighter design which has to be suggested by RDSO.

(xv) **Wire Ropes**: The indigenous wire ropes are not giving satisfactory performance. All indigenous wire ropes should be replaced by imported ones during MLR. Imported wire ropes should be tested during MLR/POH as per extant norms.

CWM/Jamalpur also suggested that MLR should lead to technical improvements especially in areas like wire ropes. The latest available technology worldwide should be inducted in service at the time of MLR. The same was agreed to.

4. **No. of cranes to be given MLR in 2007-08**: Two cranes would fall due for POH at Parel and one crane at Jamalpur during 2007-2008. These cranes should be given MLR during 2007-08.

5. **AMC for crane maintenance**: NR and a few other Railways have entered into AMC into AMCs for crane maintenance. This model should be emulated in all the Railways and details for the same can be taken from NR.

No. 2005/M (M&P)/7/2

.12.2003

New Delhi, dated .

(Saurabh Engley)

Director Mech. Engg. P) II

Railway Board

Copy to:

1. CME/CR
2. CME/ER
3. CME/NR
4. EDS(MP)/RDSO
5. CWM/JMP/ER
6. CWM//PR/CR
6.0 Minutes of 6th meeting to discuss POH, Mid-Life Rehabilitation and Technological upgradation of 140 T cranes held in Railway Board on 23rd October 2007

The following officers were present:

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1. Member Mechanical addressed the meeting and stressed on the following issues:

a) All aspects related to manufacture of cranes at JMP including procurement of material need to be put on sound footing.

b) ER should immediately review the long term plan for manufacture, POH and MLR of cranes at JMP viz-aviz the installed capacity, and identify area which might require further investment to ensure that Indian Railways’ requirement matches capacity available at JMP.

c) Currently JMP has RSP sanctions for manufacture of 17 cranes. ER should review as to how much order book is to be retained and whether it would be more prudent to go for direct procurement of some of these cranes so as to optimize the time schedule in which these 17 cranes can be made available.

d) Mid-Life Rehabilitation (MLR) : JMP and Parel Workshops should develop capabilities for modifying design of cranes to incorporate the latest technological advantages. For this, they should closely coordinate with crane manufacturers world-wide.

e) JMP’s role as in-house manufactures of 140 T Cranes should be expand to encompass development of core competency involving 140 T Cranes – JMP Workshop should be a repository of crane knowledge for Indian Railways.
f) Technological upgradation of cranes in MLR should be planned in a manner that the cranes should come at par with the technological standards of new cranes world wide, in all possible aspects including serviceability, capability etc.

g) While doing the long term planning for JMP Workshop, it should be ensured that adequate workload is shared with Parel Workshop. Duplication of facilities should not take place.

h) ER should do a comprehensive exercise to identify the problems in systems of procurement, which led to shortage of material to an extent that crane production suffered for more than two years. Both JMP and Parel workshops should ensure that good system exist wherein full support is given to crane users in the field.

i) While procuring material, the system should be reorganized to ensure that minimum number of tenders are floated to meet the requirement of material for 140 T Cranes.

j) Tender conditions should specify adequate penalties and bonuses on the basis of performance. ER should examine as to what positive incentives can be built into the tendering process.

2. EDME (W) flagged the following issues:

a) Against a total requirement of 73 cranes, only 56 are available in the Indian Railways network so far. Due to shortfall in production in JMP, we have not been able to equip the rest of the identified locations with this critical equipment. This situation needs to be rectified as soon as possible.

b) ER should ensure that procurement of material for crane production, POH and maintenance in the field should be put on sound footing.

c) Manufacture of cranes at JMP Workshop had not been upto the mark. During last 18 months only one crane has been manufactured.

d) There is a backlog of POH of cranes at JMP due to which cranes are running overdue. POH. ER should take immediate steps to liquidate the overdue POH of these cases.
e) Both CR and ER should identify the plan to incorporate the latest technological advancements in the cranes during planned Mid-Life Rehabilitation (MLR).

3. **The following issues were decided in the meeting:**

a) JMP Workshop shall manufacture five more cranes in the current year (2007-08), six cranes in 2008-09 and six cranes 2009-10.

b) A dedicated crane Cell has been formed in ER with a mandate to ensure material availability for production, POH and MLR of cranes and spares required for maintenance in the field units. This cell should be operationalised at the earliest.

c) As adequate RSP provisions for crane are always made well in advance, ER should process for stocking of as many items as possible.

d) ER should regular meeting with CMPE(R&L)s of Zonal Railways to address their issues regarding maintenance of cranes, requirement of spares etc. The first such meeting should be planned for the first week of December, 2007.

e) CR should take all due steps necessary to ensure that rate contract for spares for the Cowans Sheldon design of cranes are processed and finalized early. CR should not wait for assessment of spare requirement for mid-life rehabilitation for this purpose.

f) Overdue POH of Crane: ER should formulate a specialized maintenance programme at the field locations for overdue cranes and extend the POH due date of these cranes.

g) DME (P) II, railway Board shall an assessment of the feasibility of retrofitment of telescopic counter weight on the existing design of 140 T cranes. A vis procurement of new telescopic booms cranes.

h) JMP and Parel workshops should draw up a plan for reducing the POH cycle time from three months (at present) to 30 days.

(Saurabh Endley)
**Director Mech. Engg. (P) II**
Railway Board

No. 2006/M (M&P)/175/2
Dated 08.11.2007
Copy to : CMEs//CR, ER
COS/CR, ER
CWM/parel/CR
CWM/JMP/ER

Compendium on Crane maintenance-Group meetings for Instructions on 140 T Cranes
7.0 Minutes of the Meeting for review of POH/MLR/manufacture and maintenance of 140 T Cranes, held in Railway Board on 18.06.2009

The following were present:

**Railway Board:**

- Shri Praveen Kumar, Member Mechanical
- Shri P.K. gupta, AM (ME)
- Shri M.P. Juneja, AM(RS)
- Shri G. N. Asthana, Adv. ME (W)
- Shri Harish Gulati, EDRS (P)
- Shri Saurabh Endley, DME (P) II
- Shri S.M. Sharma, DME (Tr.)

**Central Railway:**

- Shri R. Khosla, CME
- Shri V. Meshram, COS

**Eastern Railway:**

- Shri H.C. Josi, CME
- Shri R.C. Jat, COS
- Shri Anirban Dutta, CWM/JMP
- Shri Ujjal Haldar, Dy. CME/JMP

1. Manufacture of Cranes at Jamalpur Workshop:

1.1 CME/ER stated that 7 cranes would be manufactured in 2009-10 and six cranes in 2010-11.

1.2 It was decided that of the seven cranes likely to be turned out from JMP Workshop in 2009-10, one crane would not be allotted to any Division but would be kept in JMP Workshop as POH reserve.

1.3 CME/ER advised that since CLW was not manufacturing counterweight any more, this was causing a problem, as the rate received in the tender floated by ER was much higher than the original rate of CLW. CLW is to be directed to continue making counterweight.

2. POH Crane:

2.1 POH time for crane must be reduced in PR Workshops/CR and should not be more than one month. Cranes should only be called for POH/MLR after it is ensured that material for the same is available.

2.2 Two cranes are presently awaiting in JMP Workshop due to non-availability of wire ropes slings. COS/ER stated that the tender for wire ropes has already been settled and order for wire rope slings is likely to be placed shortly.
2.3 CME/ER stated that material (other than wire rope and wire rope slings) is available for all cranes to be manufactured in the current year. However, material like machine plate, super structure and under carriage are not available for the last five cranes which would be manufactured in 2010-11. COS/ER was asked to cover these items on priority.

3. MLR Cranes:

3.1 The guidelines for replacement/overhaul of major assemblies has already been given vide Minutes of Crane Committee meeting held in Railway Board on 30th November 2006. The same should be followed for MLR. The final detailed schedule for items to be done in MLR would be drawn up based on experience gained from the first cranes which are due to be given MLR by JMP workshop in 2009-10.

3.2 The experienced gained after the first two MLRs in ER should also be used to identify when MLR should be taken for Cranes i.e at the stage of second POH or third POH.

3.3 The main purpose for going in for MLR is to increase codal life and the target should be that after MLR, the codal life of these cranes should be increased to at least 26 years or beyond.

4. Other issues:

4.1 One crane of ECoR is lying in JMP for special repairs for two years. CME/ER stated that order for slew Ring has recently been placed and the DP is August 2010.

4.2 In order to avoid situations where cranes have to wait for prolonged durations because of lack of material for repairs, both JMP and PR Workshops must keep adequate level of spare inventories.

4.3 JMP and PR Workshops should create web portals to enable them to interact with their customers.

4.4 Specifications for the telescopic boom cranes should be finalized by 30th June, 2009 and tender should be floated by Development Cell of Railway Board by 31.07.2009.

4.5 The spares for crane maintenance was required by field units have to be centralized in JMP and PR Workshops. For standardization of spares for field units, it was decided to constitute the following two committees:

<table>
<thead>
<tr>
<th>Gottwald design crane:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convener</td>
</tr>
<tr>
<td>Shri Ujjal Haldar, Dy. CME 9cranes)/MP/ER</td>
</tr>
<tr>
<td>Member</td>
</tr>
<tr>
<td>Shri Dilip Saha, DME (Power)/HWH/ER</td>
</tr>
<tr>
<td>Member</td>
</tr>
<tr>
<td>Shri Manoj kumar, Sr. DME/Danapur/ECR</td>
</tr>
</tbody>
</table>
Cowans Shedon design cranes:

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convener</td>
<td>Shri Saurabh Prasad</td>
<td>Dy. CME/Dsl./PR/CR</td>
</tr>
<tr>
<td>Member</td>
<td>Shri Sachin Punetha</td>
<td>Sr. DME/Itarsi/WCR</td>
</tr>
<tr>
<td>Member</td>
<td>Shri D.N. Rao</td>
<td>Sr. DME/Kazipet/SCR</td>
</tr>
</tbody>
</table>

The scope of the work for the Committees would be as under:

- Standardization crane spares – List of items to be kept in field units as well as at the workshops, along with quantities.
- Modality of drawal of spares by field units for replacement.
- Modality for making RSP provisions for the spares.
- Shelf life for the spares.
- Re-ordering levels for the spares.
- System of storage for the spares, especially for slow moving items.

Both Committees must submit their recommendations latest by 31.08.2009.

4.6 Training: JMP and PR Workshops should start training courses of these different levels – (i) for supervisors (ii) for maintenance staff and (iii) for operators. Two courses of each type should be held each year.

(Saurabh Endley)
Director Mech. Engg. (P) II
Railway Board

No. 2009/M(M&P)/175/2/A/T
New Delhi, dated 26 June, 2009.
8.0 Minutes of 8th meeting 140 T Breakdown crane held at RDSO/ Lucknow on 29th July, 2011

Railway Board:

1. Shri. Aunendra Kumar, AM (PU)
2. Shri. S. K. Sharma, Advisor (ME)
3. Shri. Manish Jain, DME/P-II

RDSO:

1. Shri Rajiv Vishnoi, Sr. EDS/MP
2. Shri S. Panwar, Dir/MP
3. Shri Pankaj Saxena, ADE/MP
4. Shri S.C. Bhalla, SSE/MP

Participants from Zonal Railways:

1. Shri A. K. Tewari, CMPE/CR
2. Shri Saurabh Prasad, Dy. CME/Parel Workshop,CR
3. Shri Rajesh Agrawal, CWE/ER
4. Shri C. P. Sharma, Dy. CME/JMP
5. Shri Satish Kumar, CMPE, NER
6. Shri B. Lakra, CME (O&F), NFR
7. Shri B. P. Barnawal, Sr DME/TSK, NFR
8. Shri Manish Agrawal, Sr DME/BPL, WCR
9. Shri K. N. S. Yadav, Sr. DME/DHN, ECR
10. Shri A. T. V. S. Satyanarayana, EME/SC, SCR
11. Shri Sanjay Sharma, ADME/JP, NWR
12. Shri B M Siddiqui ADME(P), MB

Sr. EDS/MP welcomed all the participants in the review meeting on breakdown crane.

Addl. Member (PU) delivered inaugural address and emphasised on a periodical review for an important asset like breakdown crane. This review must include inputs from the user that will be helpful in taking preventive measures for better maintenance and problem free service at site.
ITEM 1:- Major failure of cranes in last six-months/one year (on site & off site separately)

Details of failures of cranes at various field units are placed at Annexure ‘A’. System wise analysis indicate that failures of super structure are maximum (contributing >50% of total). Among these the systems the systems which are predominant among failures are as follows.

(a) Steel structure and counter weight system.
(b) Derrick drive
(c) Auxiliary hoist
(d) Main engine
(e) Under carriage

Railways may indicate the root cause of these failures so as to identify corrective & preventive action.

The list failure is quite short which appears to be due to less reporting by the Rlys. For a better and more exhaustive analysis it is proposed that all users must keep a data base of all on-line/off-line failures containing all important details like crane vintage, make, POH/MLR etc. This should be advised to mother shops before major schedule is undertaken to facilitate better analysis of the failure. These should be codified as per guidelines already issued. All failures should be shared with other depots for preventive action by them.

The group may discuss

(a) Action plan to reduce failures
(b) System of reporting of all failures to all users and mother shops.

DECISION TAKEN

1. Proper logging of all defects (both on site and off site) with correct defect codification (as per RDSO code), responsibility (bad design, bad material bad workmanship in shop/depot, bad handling etc) along with down time needs to be done by all users, without fail. To facilitate the logging of the failure, both the workshops must have adequately designed portals. Parel Workshop has to develop a model portal within one month.

2. At accident site, a major crane failure or crane for significant time etc. Should be analysed by a joint team of Workshop and the user within a week of the occurrence and the report must clearly indicate the root cause of failure. A copy of report should also be submitted to DME/P-II, Railway Board.
3. For better and timely logging of the defects, net connectivity to the crane base depot is a must. This should also have provision of net telephone so that users can have video calls to show failed area/components etc. All users must develop the same before the next review meeting schedule meeting in November, 2011.

4. Mobile telephones must be provided by concerned railways to the crane driver/technician and workshop service team as required.

5. All the users must acquaint themselves with the procedure of codification with in a target time of two months. All defect should be reported along with their specific code. After getting a substantial data of defects on cranes, workshops and users may suggest revision/addition of new codes.

6. JMP and Parel should provided copies of pictorial do’s and don’ts to Zonal Railways with a copy to Railway Board latest by 31.08.2011.

7. Recurring problems of cranes of BZA, DHN & MB, should be investigated and rectified within a week by the workshop under intimation to Railway Board.

**ITEM 2 :- Must change items under POH/MLR**

Based on their experience the slops have made a list of must change items which is appended at Annex ‘B’. Some of the users and both the shops suggested inclusion of some items in the POH list. Details of these items is also available in the Annex ‘B’. A few suggestions of Users are as follows:-

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Items</th>
<th>Railways</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Change of all hydraulic hose</td>
<td>NER, NFR, NWR, SER</td>
</tr>
<tr>
<td>b.</td>
<td>Change of complete seal kits &amp; rubber items</td>
<td>ECR, NER, NFR, NWR</td>
</tr>
<tr>
<td>c.</td>
<td>All electrical wires</td>
<td>NFR, NWR, SER</td>
</tr>
</tbody>
</table>

The group may discuss:-

(a) A review of must change items for POH.

(b) Fresh look at must change items of MLR keeping in mind the issues of obsolescence and residual life.
DECISION TAKEN:

Survey of the defects related to electrical wiring arising on “OFF” POH cranes should be carried out by workshops to decide about the re-wiring of the crane in POH/MLR. This should be completed in one month’s time by users and advised to Parel & JMP.

ITEM 3:- Methodology of procurement and distribution of spares for POH/MLR and /regular maintenance of Cranes.

Parel workshop is assessing the demand of users and workshops on the basis of annual spares meeting held every year. Based upon this demand, procurement is done through a centralized rate contract entered into for 5 years. On receipt of material, the same is distributed to the field depots as per their indents.

This system of procurement reduces the indenting work load. However the disadvantage of this system is over stocked/unutilized spares at depot level.

Jamalpur Workshop on the other hand is assessing the requirement of spares on the basis of their experience of POH/MLR and then adding some extra provision (25-30%) for depots. Procurement is done every year on fixed qty basis. Further they have initiated a proposal for dividing all items into A, B and C categories.

(1) A category- slow moving/heig value spares to be stocked at JMP.
(2) B category- fast moving/regular spares to be stocked at JMP
(3) C category- low value & essential spares to be stocked with consignee

This system has the advantage of limiting the purchases to the bare minimum but at the same time may lead to delays in procurement.

The group may discuss following items:-

(a) Whether to have a rate contact or fixed qty. procurement?
(b) Methodology for assessing the spares requirement for POH/MLR.
(c) Review of items to be stocked by crane users.

DECISION TAKEN:

1. Parel system of procurement should be studied by JMP workshop for implementation. Rate contract with OEM/ authorised representative is must for ensuring quality.
2. For better appraisal of all the material and maintenance related issues of the users, there must be a six-monthly meeting by JMP and Parel individually. One of these meetings should focus on spare requirements and other on failures etc. The main Vendors may also be invited during these meetings. Railway Board should also be intimated to enable DME/P-ll to attend the same if necessary.
3. In every annual user meeting held for preparing indents, the concerned workshop must review the list of items of to be stocked by the users and stock position of the user for better regulation of the non-moving items.

4. All the users shall provided the following list and recommended qualities to the respective workshop:

   a) Spares for regular use to be purchased /stocked at depot level.
   b) Emergency spares to be purchased and stocked by the workshop. Both these lists should be collected by the workshops latest by 31.08.2011 and final list frozen with a copy to Railway Board by 30.09.2011.

**ITEMS 4 : AMC of the cranes/its sub-assemblies**

The cranes have mainly three systems Main Engine, SLI and hydraulic+pneumatic. For main engine there is AMC with Cummins'(authorised representatives), and for SLI, HYD+PNEU the practices at the depots are at variance. Some field units have gone for a The Rlys need to share their experience with these contacts.

The group may discuss:

   a) Whether there should be a single contract covering hydraulics + pneumatics+SIL along with Main Engine or otherwise.
   b) For main engine is it possible to have one contract combining all the Gotwald users at Jamalpur and Cowan Sheldon at Parel Workshop.
   c) Whether the above contract should be comprehensive OR there should be rate contract for supply of items and AMC for diagnosis and repair.
   d) Up-to what schedule there is no need of AMC?

**DECISION TAKEN:**

1. It was emphasised that irrespective of the AMC, the responsibility for functioning of the crane at accident site without failure resets with the user only. The AMC can only be used as a support function in maintenance of the cranes.

2. With the interaction and feedback from users, it appears that know how about SLI is poor. Both the workshops must arrange a training programme on SLI and the users should ensure the attendance of their staff in this programme, whenever slot is given.

3. Eastern Railway proposed upgradation of the SLI specification to integrate the additional items like safe orientation (on all axis of movement) and sensors to monitor the position of props etc. A feedback from the users on the utility of these features and its implication on maintenance aspect should be obtained for deciding upon this issue. This will be coordinated by RDSO.

4. Parel and JMP should enter into an AMC with Cummins at the time of procurement/overhauling of the diesel engine. This will ensure uniformity in the AMC
of engines and will also take care of the problems being faced by the users with the dealers of Cummins.

**ITEMS 5:- Codal life of 140 T cranes & life extension beyond 26 years**

The existing schedule of cranes is as follows:-

<table>
<thead>
<tr>
<th>EXISTING SCHEDULE</th>
<th>TIME PERIOD</th>
<th>CUMULATIVE LIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1ST POH</td>
<td>8 YEARS</td>
<td>8 YEARS</td>
</tr>
<tr>
<td>REHAB</td>
<td>6 YEARS</td>
<td>14 YEARS</td>
</tr>
<tr>
<td>2ND POH</td>
<td>6 YEARS</td>
<td>20 YEARS</td>
</tr>
<tr>
<td>CONDEMN</td>
<td>6 YEARS</td>
<td>26 YEARS</td>
</tr>
</tbody>
</table>

PR has suggested for revision of this schedule as under:-

<table>
<thead>
<tr>
<th>REVISED SCHEDULE</th>
<th>TIME PERIOD</th>
<th>CUMULATIVE LIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1ST POH</td>
<td>8 YEARS</td>
<td>8 YEARS</td>
</tr>
<tr>
<td>2ND POH</td>
<td>6 YEARS</td>
<td>14 YEARS</td>
</tr>
<tr>
<td>REHAB</td>
<td>8 YEARS</td>
<td>20 YEARS</td>
</tr>
<tr>
<td>3RD POH</td>
<td>8 YEARS</td>
<td>28 YEARS</td>
</tr>
<tr>
<td>CONDEMN</td>
<td>8 YEARS</td>
<td>36 YEARS</td>
</tr>
</tbody>
</table>

There are 69 no. of cranes on Indian Railways. Out of which 9 nos. Going to complete their codal life in next two years i.e. by 2013. One of the user (Bilaspur Div.) has already refered a letter in this regard.

The group may discuss:-

(a) Condemnation of these 9 cranes and manufacturing of new cranes under RSP against replacement.

OR Extension of life beyond 26 years-

i) Criteria for assessment of residual life.

ii) audit of distressed zones/critical areas (by techniques like radiography etc).

(b) If extension is done as per schedule suggested by PR then which extra components need to be replaced during POH and MLR and their impact on cost.

Compendium on Crane maintenance-Group meetings for Instructions on 140 T Cranes
(c) Cost effectiveness of life extension.

DECISION TAKEN:

1. Condemnation of 140 t crane should not be done on age basis alone. No crane will be condemned on age basis alone after completion of 26 years service life. The crane will be subjected to a structural audit at the time of POH. Structural audit will be coordinated by RDSO.
2. The workshops should collect data of the annual usage of each crane. This should indicate the hours for which the crane has actually worked for breakdown or any other activities.
3. Replacement of the components /subassemblies due to obsolescence should be done only as a last resort after eliminating all the other options. While taking this decision, the cost escalation due to obsolescence should be critically examined.

ITEMS 6:- Approach to POH and MLR and tackling the issues of obsolescence & action Plan to liquidate over dues

(A) Obsolescence:-

An ideal approach to POH & MLR would be that no item should become obsolete up to next POH/MLR. Therefore the items which might get obsolete before next POH/MLR must be changed during POH/MLR. For example items reported by PR shop for CS cranes (old) are (1) HE-2 pump (2) SLI (3) NT 743 engine.

Group may discuss:-
- Upgradation/Retro fitment of cranes in MLR to avoid obsolescence in future.
- Some action plan for NT 743 engine.

(B) Overdues:-

Cranes due for POH/MLR in next 5 years are appended in Annexure ‘C’ sheet 3. Total 11 cranes are due for POH and 13 for MLR (without considering 14 cranes which are going to complete their codal life in next 5 years although these cranes might require some attention if retained in service beyond codal life.

Group may discuss:-

(1) An action plan to liquidate the above mentioned load in next 5 years.
(2) To optimally utilize the capacity of shops, reduction of POH/MLR time by keeping more unit exchange spares can be discussed.
(3) What type of attention to be given to those cranes which are completing codal life next year onwards.
DECISION TAKEN:

1. Both the workshops should critically look at the cycle time of POH/MLR and make a long term plan crane by crane to liquidate the over dues in next three years. This plan should be presented in November, 2011.
2. The updates data base of the cranes duly indicating the commissioning, POH, and MLR details should be presented in the next meeting by both the workshops.

ITEM 7:- Infrastructure at depot level- T&P, initial stocking lubricants etc.

The basic infrastructural facilities required in a crane base have been circulated vide RDSO report no MP. MISC.-166 Dated May 2005. Details of the infrastructure. T&P,M&P presently available with the depots is appended at annex ‘F’. It can be seen that several depots are not having the basic facilities.

The group may discuss the action plan to setup the requisite facilities.

DECISION TAKEN:

Zonal Railway must gear up for creation of facilities by 31.03.2012.

ITEMS 8:- POH MANUAL

Presently, POH activity is being done as per the available manuals of the OEM’s manuals and shop’s own practice. Maintenance manual for POH/MLR is desirable to ensure standardisation & quality. This exercise need be completed at the earliest. It would be advisable to form a committee of three members, one each from the concerned workshop, user division and RDSO to finalize this manual.

DECISION TAKEN:

Parel & JMP should compile a comprehensive POH manual to be used for POH/MLR activity at workshops. This should be done within next 6 months.

ITEM 9 :- Crane driver training

In the present system crane drivers, maintenance staff and supervisors are trained at workshops. For users this training is compulsory but for old users there are no fixed norms. Parel Workshop has suggested for an additional course for training in operation of 140 T crane at least once in a year and for better “HAND ON, the course may be organised at a time when a crane is expected to be turned out (New built or OFF POH). JMP Workshop has also suggested for an additional training of one week every year.
The group may discuss:-

(a) Whether the competency certificate to the crane drivers is issued on the basis of their PASS report from workshops [validity of competency & period may discussed].
(b) Minimum no. of drivers per crane to be trained.
(c) Whether a course for maintenance staff is also required.

DECISION TAKEN:

1. There is a strong need for developing a fleet of highly component crane drivers and support staff as well.
2. Each Sr.DME/In-charge of the 140 T crane/ART should identify and post suitable staff based on their age profile, education and competency. It is preferable that the age should be between 35 to 45 years. However, in case of experienced and skilled drivers etc. this condition may be relaxed. All Zonal Railways should give a confirmation to effect to Railway Board before the next review meeting in November'2011.
3. A course for developing new drivers should be planned by workshops duty taking feedback from the users on theoretical and practical needs.
4. The plan for drivers training should be tabled in the next meeting by both the workshops.
5. Zonal Railways should ensure that the core gang is deployed for 140 T crane and ART as per the yardstick and should not be deployed for any other duties. A certificate to this effect should be given by CMPE of each Zonal Railways to Railway Board by 15th Sept. 2011.
6. JMP & Parel should periodically verify that the staff trained by them for 140 T crane is actually being utilised by the user for crane duties only.
7. As already decided by Railway Board, JMP (IRIMEE) is to be developed as a centre of excellence for training of hydraulics and pneumatics.
Vendor Issues:

1. Gear Box: The representative of M/s INTEL informed the group that there is a world wide practice of overhauling the gear boxes using kits. Both the workshops should examine this and take decision in this regard.

2. M/s Agromach will provide a complete list of spares for Gottwald cranes along with rate to JMP workshop by 15th Aug.2011.

3. M/s Cummins will ensure that they will continue to provide spares and services for NT-743 engine.

4. M/s PS Engg. Stated that they have noticed certain deficiencies in POH/MLR crane from JMP. A list of these deficiencies will be provided by them to JMP and RDSO by 15th Aug. 2011.

5. All users will provide details of crane toppling since the induction of the crane to DME/P-II/Railway Board by 31st Aug.2011.

( Sudhanshu Panwar)
Director/Std.MP
For Director General/MP
Date: 9th Aug.2011.

No.SD.CRMG
Copy to: CMEs/All Zonal Railways
CWM/JMP/ER & CWM/Parel?CR
DME P (II)/Railway Board
Enclosed: .......

Compendium on Crane maintenance-Group meetings for Instructions on 140 T Cranes
9.0 Minutes of the 9th Crane Maintenance Group Meeting held at Central Railway Locomotive Workshop, Parel, Mumbai on 6th June 2012

The 9th Crane Maintenance group meeting was held at Central Railway Locomotive Workshop, Parel, Mumbai on 6.6.12. Particulars were as under:

<table>
<thead>
<tr>
<th>Chair</th>
<th>Shri S K Sharma, AM (PU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railway Board</td>
<td>Shri Manish Jain, Director ME (P-II)</td>
</tr>
<tr>
<td>RDSO</td>
<td>Shri Sudhansu Panwar, Director (MP)</td>
</tr>
<tr>
<td>CR</td>
<td>1. Shri Anup Sahu, CME</td>
</tr>
<tr>
<td></td>
<td>2. Shri AK Garekar, CSO</td>
</tr>
<tr>
<td></td>
<td>3. Shri Prem Chandra, CWE</td>
</tr>
<tr>
<td></td>
<td>4. Shri Suneet Sharma, CWM/PR</td>
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<tr>
<td></td>
<td>5. Shri A K Tewari, CMPE (D)</td>
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<td></td>
<td>6. Shri B L patil, CME (Plg)</td>
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<tr>
<td></td>
<td>7. Shri Saurabh Prasad, Dy. CME, PR</td>
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<td></td>
<td>8. Shri N K Pachauri, Dy. CME, PR</td>
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<tr>
<td></td>
<td>9. Shri Sanjay Sharma, Sr. DME CLA</td>
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<td></td>
<td>10. Shri S N Kadam, DME NGP</td>
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<td></td>
<td>11. Shri N A Deshmukh, AWM PR</td>
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<tr>
<td></td>
<td>12. Shri V T Gajbhiye, AEME HQ</td>
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<td>ER</td>
<td>1. Shri C P Sharma, Dy. CME JMP</td>
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<tr>
<td></td>
<td>2. Shri R K Nath, SME ER</td>
</tr>
<tr>
<td>ECR</td>
<td>Shri Dilip Kumar, Dy CME ECR</td>
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<tr>
<td>ECoR</td>
<td>Shri M Srinivas, Sr. DME SBP</td>
</tr>
<tr>
<td>KRCL</td>
<td>1. Shri Sanjay Gupta, CME KRCL</td>
</tr>
<tr>
<td></td>
<td>2. Shri M.G. Kshetrapal, RME MAO</td>
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<tr>
<td>NR</td>
<td>Shri Sheel Bhadra, Dy. CME NR</td>
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<tr>
<td>NCR</td>
<td>1. Shri Dinesh Shukla, CMPE (D)</td>
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<td></td>
<td>2. Shri R.K.Jatav, Sr. DME AGC</td>
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<tr>
<td>NER</td>
<td>Shri Bhojuram, ART Incharge GKP</td>
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<tr>
<td>NWR</td>
<td>1. Shri sanjay Sharma, AME HQ</td>
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<td></td>
<td>2. Shri C M jha, AEME JP</td>
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<tr>
<td>NFR</td>
<td>1. Shri S C sawaiyan, CME (O&amp;F)</td>
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<td></td>
<td>2. Shri B P Barnwal, Sr. DME TSK</td>
</tr>
<tr>
<td>SR</td>
<td>Shri M Shamim; AEME ERS</td>
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<tr>
<td>SCR</td>
<td>Shri Nageshwar Rao, Sr. DME KZJ</td>
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<td>SER</td>
<td>Shri B K Srivastava Dy CME HQ</td>
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<td>SECR</td>
<td>Shri S K Sonkusare, Dy. CME</td>
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<td>Shri Ranga Rao, AEME BIA</td>
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<tr>
<td>SWR</td>
<td>Shri D Govind Kumar, CMPE (D)</td>
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<td>Shri Anandan, AEME ASK</td>
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<tr>
<td>WR</td>
<td>Shri S Rajvanshi, CME (F&amp;O)</td>
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<td>Shri Rajnish Tomar, Sr. DME BCT</td>
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<tr>
<td>WCR</td>
<td>Shri O P Shrivastava, Dy. CME</td>
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<tr>
<td>Item No.</td>
<td>Discussion &amp; Decision</td>
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<tr>
<td>1.0</td>
<td><strong>FAILURE OF CRANES</strong></td>
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<tr>
<td>1.1</td>
<td><strong>Portal based logging of crane defects by crane depots:</strong></td>
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<td></td>
<td>Logging of defects on the portal is yet to be started by crane depots. Logging of on-site/off-site 140 T crane defects and failures should be started immediately on the JMP portal <a href="http://www.140t.weebley.com">http://www.140t.weebley.com</a> by Gottwald crane users, and Parel portal <a href="http://10.33.80.175">http://10.33.80.175</a> by Cowans Sheldon crane users with the correct defect code. RDSO and Workshops should conduct defect-wise analysis for ensuring timely attention to defects and working out an action plan to address failures of repeated nature. Henceforth, workshops should respond to users only if the defect is logged onto portal.</td>
</tr>
<tr>
<td>1.2</td>
<td><strong>Joint Analysis by Workshop &amp; depots for accident-site crane failures:</strong></td>
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<td>1.2.1</td>
<td>Joint Analysis by Workshop &amp; depots for accident-site crane failures :</td>
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<td></td>
<td>AM (PU) stressed that failure/derailment of 140 T crane at accident site is not acceptable and this must be investigated in detail for corrective and preventive action. It must be ensured that crane depots and Workshops jointly analyze each instance of 140 T crane failure at accident site as already instructed.</td>
</tr>
<tr>
<td>1.2.2</td>
<td>ECR must investigate in detail the reason for toppling at site of the Danapur 140 T crane on 27.5.12 and take remedial action for preventing recurrence of such cases. Similarly, NCR should fix up responsibility for the propping failure during handling of the Sangam Express accident. Reports regarding the same should be put up to Railway Board.</td>
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<tr>
<td>1.2.3</td>
<td>SECR shall prepare a video film on ‘Propping of 140 T crane at Accident sites’ for circulation amongst all crane depots.</td>
</tr>
<tr>
<td>1.2.4</td>
<td>NCR has prepared to check-list of activities and items to be checked prior to pre-site departure especially during Engineering blocks. This should be loaded by NCR on the SDMS and the 140 T Crane portals to enable other Railways to adopt similar practices and improve upon the check-sheet, if required.</td>
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<tr>
<td>1.2.5</td>
<td>Issue of wooden packing failure was raised by some users. RDSO advised that specifications for new</td>
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<td>Section</td>
<td>Description</td>
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<td>1.2.6</td>
<td>Procurement are already available. Old packing must be bound by wires to prevent crushing under load. Availability of adequate packing in good condition must be reviewed at the level of CMPE and confirmation given to Railway Board by 3rd July 12. AM (PU) also asked all CMPEs/Zonal officers that critical issues related to crane must be brought to the notice of GM in time for ensuring corrective action.</td>
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<tr>
<td>1.3</td>
<td><strong>Net-connectivity at crane depots &amp; video calls through net telephone:</strong> Many crane users have not been able to provide net-connectivity at 140 T crane depots, despite a target of Nov. 2011. In absence of net-connectivity, access to portal for defect-logging, access to web-based information, video calls through net telephone are not possible. Crane depots should ensure net-connectivity is provided by 31st July 12 and the same should be confirmed by zonal Railways to railway Board and workshops.</td>
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<td>1.4</td>
<td><strong>Provision of Mobile phones to crane driver/technician and Workshop service team:</strong> Difficulties are being faced in obtaining vetting and sanction for provision of CUG mobile phones to crane driver/technicians/service team. Railway Board has taken up the issue and suitable directives shall be issued in this regard.</td>
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<td>1.5</td>
<td><strong>Pictorial Do’s and Don’ts:</strong> JMP and Parel workshops confirmed Pictorial Do’s and Don’ts have been put on the respective portals for Gottwald and Cowans Sheldon crane users. Copies of the same should be provided to crane depots to be always kept with the crane. Dissemination of the information to all ART staff must be organized by Sr. DMEs and ensured by Crane depots. This exercise must be completed by 31st July 12.</td>
</tr>
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</table>
1.6 Failures/defects on specific cranes reported by various Railways were discussed by the Group. The following was decided:

1.6.1 **Gottwald Cranes**:
- SER reported problems of excess operation time, jerk in boom etc of the BKSC old design crane. JMP workshop and SER shall jointly audit functioning of the BKSC crane and submit report within one month.
- In order to reduce cases of boom failure, JMP workshop shall replace the old design boom limit switch with the new improved design of limit switch on all the Gottwald cranes. Similar failures of particular component as and when brought to notice of JMP/parel, should be followed up with review of all similar installations for corrective action.
- The problem of boom root cylinder leakage and counterweight cylinder leakage has to be resolved by suitable inputs by JMP Workshop. Preventive action should also be taken to determine shelf life of items prior to their fitment on cranes.
- NR reported problem of corrosion and structural problems in LKO crane. Since the crane is at Lucknow, RDSO should associate in the structural audit with JMP and NR to check any unusual in the crane. The exercise should be completed within a month. The crane is also due for special MLR and must be taken up for the same after review of structural audit.

1.6.2 **Cowans Sheldon Cranes**:
- Main HE-2 pump failure – Replacement of main HE-2 pumps with new design pumps has been done on SBC crane at Parel and is planned on the ED crane during MLR in July 12. Railway Board has sanctioned RSP for the same and Parel workshop should plan replacement of all old design pumps on priority.
- Parel Workshop should keep in readiness one unit exchange main Cummins engine for Cowans Sheldon cranes and unit exchange spares for the Cummins Main engine in view of depots facing problem of long lead time in arranging engine spares for tackling engine defects.
- The problem of derrick tie cylinder leakage reported by crane depots should be resolved by Parel and implemented on all cranes during conduct of MLR.
- For continuous monitoring of contamination of hydraulic oil, which oil, which is a contributory cause for on-site failure of hydraulics of 140 T cranes, the

CMPE SER
CWM JMP
CWM JMP
Dir. RDSO
CWM JMP
CMPE NR

CWM PR
CWM PR
CWM PR
Dir. RDSO
CWM PR
Banguluru crane has been provided with an on-line particle monitoring unit in the hydraulic circuit. Parel Workshop may provide details to RDSO for studying the same for standardizing the same for implementation on cranes.

| 1.6.3 | AM (PU) emphasized that instances of hydraulic cylinder leakage (viz. reported on BKSC crane) taking place on cranes provided POH/MLR are not acceptable. Workshops should ensure that proper that inputs of material, workmanship and design are provided during POH/MLR and 140 T cranes are not released by workshops with defects. | CWM JMP  
CWM PR |
| 1.6.4 | The root cause of each failure should be posted on the respective portals by users/workshops for sharing with others so that corrective action if any can be taken by all concerned. | All CMPEs  
CWM JMP  
CWM PR |

### 2.0 INFRASTRUCTRE AT DEPOTS:

**2.1**

**2.1.1** Provision of Covered Shed at crane depots

31 crane depots confirmed availability of covered sheds. Around 20 crane depots on various Zonal Railways 9e.g. NR, SWR, ECR, ECoR, SCR, WCR, KRCL etc.) do not have work sanctioned for covered sheds for 140 T cranes. Zonal Railways not having covered shed should immediately identify suitable site for the same, and process for their sanction under Works Programme under GM’s powers. Covered sheds for around 16 crane depots are sanctioned/under construction. Railways indicated delays in construction as fund availability is a constraint to the notice of GM for remedial action.

**2.1.2** Provision of covered sheds should be monitored by CMEs and progress of works must monitored closely and delays/lack of funds should be brought to the notice of Railway Board. Latest status regarding provision of sheds for existing and cranes planned to be homed should be confirmed by all Railway Board by 31st July 12.

**2.1.3** The provision of concrete prop bases should also be included in the sheds for rolling out bogies.

| 2.1.2 | Provision of covered sheds should be monitored by CMEs and progress of works must monitored closely and delays/lack of funds should be brought to the notice of Railway Board. Latest status regarding provision of sheds for existing and cranes planned to be homed should be confirmed by all Railway Board by 31st July 12. | ALL CMEs |
| 2.1.3 | The provision of concrete prop bases should also be included in the sheds for rolling out bogies. | ALL CMPEs |
## 2.2 Review of infrastructure for schedule maintenance at crane depots:

It was discussed that many crane depots do not requisite infrastructure with respect to equipment and tools to conduct schedule maintenance e.g. hydraulic torque wrenches for tightening of bolts, greasing; fault-finding, diagnostic and testing methods for various sub-assemblies, wire-rope attention mandated by statutory provisions during prescribed schedules, spectrographic analysis of hydraulic oil, etc. Dy. CME PR, dir. (MP)/RDSO and Dy. CME JMP shall jointly review the maintenance practices at crane depots and list out various equipment and tools essential for proper conduct of maintenance schedules at crane depots to bring down crane failures and for reduced downtime of cranes. This exercise should be completed in three months so that supplemental instructions to RDSO report No. MP-Misc-166 (Rev 0.0) May 2005 can be issued.

JMP Workshop suggested that in view of lack of infrastructure and technical know-how in hydraulics particularly at C&W depots/yards where most 140 T cranes are located, higher maintenance schedules should be conducted by the nearest Diesel Shed. It was decided that in case required, concerned Railways may consider taking assistance of Diesel Sheds located nearby for conduct of higher schedules.

Users were asked in the last meeting held at JMP that in case they are unable to procure hydraulic torque wrench for slew ring bolts, vetted indents can be given to JMP workshop for bulk procurement. However, neither the torque wrench has been procured by users nor have they sent indents to JMP. Action on this must be taken immediately under confirmation to JMP.

### 2.2.1

Dir. RDSO
Dy. CME PR
Dy. CME JMP

### 2.2.2

All CMPEs

### 2.2.3

All CMPEs
<table>
<thead>
<tr>
<th>3.0</th>
<th>AMC FOR CRANES/SUB-ASSEMBLIES</th>
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<tr>
<td>3.1</td>
<td>Centralized AMC for Cummins Engine :</td>
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<tr>
<td>3.1.1</td>
<td>JMP is processing for centralized AMC for Cummins Engine based on offer submitted by M/s Cummins India Ltd. However, many crane depots expressed dissatisfaction with the response of After-sales Service division of M/s Cummins which has delayed the implementation of a centralized AMC. This was conveyed to representative of M/s Cummins India for necessary action and bringing about improvements in customer satisfaction. Dy. CME/JMP indicated that centralized AMC is expected to be in position by Jan. 13. Hence users should continue with existing arrangement till then and be in dialogue with JMP workshop regarding actual implantation of centralized system so that cranes maintenance does not suffer due to absence of AMC.</td>
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<td>3.1.2</td>
<td>SCR complained regarding the delayed response of M. /s Cummins India Ltd. in provision of spares for the NT-743P model of Main engine of 140 T old design Cowans crane. M/ s Cummins stated that in view the engine being out of production, there is excessive lead time in organizing spares. M/ s Cummins India Ltd. was advised to take necessary steps to bring down lead time in supply of spares and also provide continuous support to the NT-743P engine. Parel workshop should be in ready condition at all times so that the same can be utilized by any crane depot requiring the same. Parel workshop should also look at copy of the JMP AMC model to work out if it will ensure faster availability of spares.</td>
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<td>3.2</td>
<td>AMC for various-assemblies :</td>
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<td>3.2.1</td>
<td>SER has reported problems regarding putting in place an AMC of hydraulics and pneumatics. It was discussed that trained staff should be developed for items under hydraulics and pneumatics as already has been instructed by AM (PU) in the last Crane maintenance group meeting held at RDSO in 2011, especially since the ultimate responsibility for crane functioning/ failure at site remains with the crane depot in-charge. It was decided that periodical changing of filters and monitoring contamination and condition of hydraulic oil should be done regularly and air brake system of the cranes attended to by the depots.</td>
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</table>
### 3.2.2

Assistance of workshop may be taken for changing of hydraulic pumps/valves/cylinders etc., if required. Few STCs like Banguluru and Lucknow should take up training of trainers in hydraulics and pneumatics through reputed institutes. They can be train the crane staff thereafter.

NR raised the need for a centralized comprehensive AMC for NR cranes for periodical maintenance requirements. NR was asked to go ahead with their specific requirements. NR was asked to go ahead with their specific requirements and report the progress and efficacy of the AMC. CR and SCR should upload copies of the comprehensive AMC put in place by CR for the Nagpur crane and SCR for the Purna crane onto the SMDS and and the web-portal for access by all crane depots.

### CRANE DRIVER TRAINING

#### 4.1 Development of pool of crane drivers and support staff:

**4.1.1** Some crane depots e.g. on NR have only one crane driver for the 140 T crane. Zonal Railways shall ensure that there are two crane drivers posted with each 140 t crane. The crane drivers should preferably by less than 45 years of age, with adequate technical background to understand complexities of the 140 T crane.

**4.1.2** All divisions and both workshops shall have to make special efforts to retain 140 T crane/accident relief expertise by identifying, training and putting in place younger staff of the preferred age group, who can timely replace the retiring staff, without any loss of effectiveness of ART/140 T crane. This should be periodically monitored by Sr. DMEs and HQ.

**4.1.3** The issue enhancement of Breakdown allowance for staff motivation and benefits to Breakdown in-charge to enable develop a pool of AT staff have been sent by various Zonal Railways to Railway Board. The same is under consideration at Railway Board and instructions in this regard are expected to be issued shortly.

**4.1.4** Development of core 140 T staff and ART as per yard-stick should be ensured by crane depots to ensure development of expertise for 140 T crane driver was discussed and felt that in view of view of varied practices followed by zonal

CMPE NR
CMPE CR
CMPE SCR

All CMPEs

Dir. ME (P-II) RB

ALL CMPEs
### 4.2 Training of 140 T Drivers:

Parel workshop presented a 12 week training module with curriculum details for induction training of new crane operators for 140 T cranes. The module comprises of 4 week training at workshop, followed by 4 week training at nominated depot (BSL for Cowans Shedon old design and Daund for Cowans Shedon new design) and finally 4 week training on the parent division. JMP should also nominate a particular location for imparting operation training in case a crane is not available in workshop.

The divisional training would also include familiarization with beat, control working during accidents etc. The theoretical module may have interspaced with operation training. JMP and Parel should have uniform programme structure. The detailed training methodology and curriculum should be jointly reviewed and finalized for both Gottwald and Cowans Sheldon cranes by Dy. CME PR and Dy. CME JMP within one month. The first course should be started immediately by Parel and by JMP and subsequent courses should be improved taking feedback from users.

In view of no practical experience of new crane operators, it is imperative to provide them with adequate exposure to accident site conditions to improve his effectiveness in handling accidents and also to avoid toppling/crane failures. The need to provide adequate exposure to crane drivers in all aspects of crane operators can be met by setting up a 140 T crane training simulator at a nodal location. The modalities for implementation should be explored in greater detail by Jamalpur & Parel workshop.

Workshops should provide certification to crane operators on completion of the induction training and other training programmes. It was clarified after discussion that competency certificate to crane drivers shall be issued by Sr. DMEs.

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<thead>
<tr>
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<td>4.2.5</td>
<td>The issue of periodical course for crane drivers was discussed and decided that only need based training programme should be conducted.</td>
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<td>4.3</td>
<td><strong>Training of Crane Maintenance Staff:</strong></td>
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<td>4.3.1</td>
<td>AM (PU) emphasized that both workshops should have a core group of experts in various aspects of the crane. Workshops and depots should train engineers and staff who can replace the retiring crane maintenance as suggested by SCR should be developed for both Gottwald and Cowans Sheldon cranes.</td>
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<td>4.3.2</td>
<td>As decided in the 8th Crane Maintenance group meeting at RDSO in 2011, Jamalpur should develop as 140 T Crne focused centre of Excellence in Hydraulics and pneumatic for 140 T cranes, for which inputs should be taken from M/s Rexroth, who are the OEM for Hydraulic/Pneumatic systems. AM (PU) instructed that training programmes with tie-up with M/s Rexroth must be put in place by Jamalpur workshop for various Railway user and workshop requirements at the earliest since training is a pressing need of crane depots for effective working of the 140 T crane at site.</td>
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<td>5.0</td>
<td><strong>FITMENT OF CBC ON CRANES:</strong></td>
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<td>Some of the railway viz. ECR have demanded fitment of CBC on 140 T cranes. RDSO stated that it would not be prudent to make structural changes for provision of CBC on the crane/match truck and other vehicles. Also, NER stated that such provision would adversely impact outreach of the crane critical for handling coaches during accidents.</td>
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<td>It was therefore decided that CBC shall not be provided on the 140 T crane and if required, crane users may provide transition coupling on the crane special.</td>
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### 6.0 **Approach to poh and mlr and tackling issues of obsolescence and action plan to liquidate overdues**

#### 6.1 **Plan of Jamalpur & Parel workshops liquidate overdues:**

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<tr>
<th>Subsection</th>
<th>Details</th>
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<tr>
<td>6.1.1</td>
<td>Updated Database of commissioning, POH and MLR details was presented by both workshop has planned MLR for 9 cranes towards liquidating the overdue position. Parel workshop has only one crane overdue POH/MLR which shall be liquidated by taking up the Erode crane for MLR in July'12.</td>
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<td>Zonal Railways e.g. SCR, SER etc which have expressed need for additional cranes should send their consolidated requirements to Railway Board by 31st July 12 so that induction of new cranes/replacement cranes can be planned in advance. The higher capacity 175 T cranes may be provided at either an additional location or as replacement to some of the existing cranes.</td>
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#### 6.2 **Obsolescence issue of Cowans Shedon cranes:**

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<th>Subsection</th>
<th>Details</th>
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<tr>
<td>6.2.1</td>
<td>Replacement of obsolete Main Hoist HE-2 pumps along-with gearbox; auxiliary engine is being conducted during MLR. The same has been provided on the SBC crane and worked satisfactorily during restoration of the Hampi Express accident in May 12. This should be expeditiously provided on all the balance 11 old design cranes.</td>
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<td>6.2.2</td>
<td>Parel workshop is providing a microcontroller based safe load indicator (SLI) with increased accuracy and more advanced features like touch screen and graphic display, auto duty selection, GPS based data-logger, additional sensors etc. This has been appreciated by SWR during working of the Bangaluru 140 T crane at site of Hampi Express accident in May 12. RDSO should review the specifications of SLI for issue of standard specifications for implementation of crane.</td>
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#### 6.3 **Obsolescence issues of Gottwald cranes:**

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<td>KRCL raised the issue of a number of critical equipment like MO series control blocks, brake cylinders, gear boxes, electronics of Gottwald design cranes becoming obsolete/phasing out within 1-2 years. Jamalpur workshop assured that they were aware of the concerns and timely</td>
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CWM JMP

CWM PR

All CMEs

Dir. RDSO

CMW JMP
7.0 CODAL LIFE OF 140 T CRANES – STRUCTURAL AUDIT

7.1 Special MLR of Cranes:

7.1.1 Special MLR is to be conducted on 140 T cranes in the 26th year of service. ER has issued program for special-MLR of 9 cranes and JMP workshop has already taken up the Bilaspur crane for special MLR.

7.1.2 Post special-MLR in the 26th year of service, POH shall continue to be done at a periodicity of six years along-with structural audit to be conducted during POH so as to monitor fatigue and stresses in the structures of the crane.

7.2 Structural Audit of Cranes:

7.2.1 RDSO has prepared structural audit scheme for Gottwald cranes which has been adopted by JMP workshop. This audit scheme should be reviewed by RDSO to include checking of alignment, straightness of structures like boom etc. by using optical/laser methods so as to ensure required structural strength to handle loads during operations at accident sites. Based on the preliminary survey, JMP will advise to Railway Board by 31st July 12 as to based on condition, which cranes are not considered fit for taking up the full audit.

7.2.2 NR and KRCL raised the issue regarding corrosion in cranes necessitating regular painting by crane depots. Jamalpur and Parel workshops may examine the feasibility of undertaking PU painting during manufacture/MLR/POH of cranes as a remedial action.

8 MEHODOLOGY OF PROCUREMENT AND DISTRIBUTION OF SPARES FOR MLR/POH/REGULAR AMINTENANCE OF CRANES AND STRATEGIES FOR SUB-ASSEMBLIES OVERHAUL

8.1 Rate Contract for spares:

8.1.1 Gottwald crane Spares: ER has started the process of floating rate contract for spares. However, difficulties are being experienced in obtaining budgetary quotations from various vendors for rate contract. It was suggested that first round of procurement be done on fixed quantity basis.
followed by rate contracts similar to the process adopted by Parel Workshop. ER shall review the same and expedite adoption the rate contract model as decided in the last meeting.

Various zonal Railways stated that JMP workshop had asked for vetted indents for A&B category spares for floating rate contract. It was clarified by JMP workshop to crane depots are not required at this stage for floating rate contract.

**Cowans Shedon Cranes**: CR informed that the rate contract is under finalization, and Advance acceptance has been issued for Rexroth items.

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<th>8.2</th>
<th><strong>Individual Meetings by Jamalpur &amp; Parel Workshop on material and maintenance related issues:</strong></th>
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<td>It was confirmed that conduct of periodical meetings have started. Some crane depots e.g. JHS/NCR have not submitted any indents for periodical schedule maintenance spares and consumables since a number of years. AM (PU) instructed that all crane depots should ensure timely submission of vetted indents for maintenance spares to workshops for procurement. Also, the database of spares available at individual crane depots should be put up on the portal for crane users. Depots may provide this information on a periodical basis to the workshops.</td>
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<tr>
<th>8.3</th>
<th><strong>Review and Ciculation of list of spares for regular use at depot and emergency spares to stocked at workshop:</strong></th>
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<td>Lists have been circulated by Jamalpur and Parel workshops. These lists should be reviewed by the following committee of three ART SSEs along-with the workshops for finalization. The exercise should be completed by 31-July:</td>
</tr>
<tr>
<td>Gottwald old design crane</td>
<td>SSE BIA/SECR, SSE KGP/SER and SSEASN/ER</td>
</tr>
<tr>
<td>Gottwald New design crane</td>
<td>SSE/PUA/SCR, SSE MYS/SWR and SSE/CLA/CR</td>
</tr>
<tr>
<td>Cowans Sheldon old Des. Crane</td>
<td>SSE SBC/SWR, SSE</td>
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| 8.1.2 | }

| 8.1.3 | }

| All CMPEs | CWM JMP |

| All CMPEs | CWM PR |

| All CMPEs | |
### 8.4 Provision of funds for High Value spares:

SECR has stated that funds for high value items for cranes should be processed by depots under RSP instead of Revenue. After discussion it was decided that this would be reviewed on case-to-case basis as per specific requirements for the 140 T crane i.e capital spares would be procured under RSP and maintenance spares would be procured under RSP and maintenance spares would be covered under Revenue.

### 8.5 Sub-assembly overhaul:

SCR stated that sub-assembly overhaul should be from got done from OEM/authorized dealers. Both Parel and JMP workshops confirmed that they have started the same by getting retro-fitment/ overhaul of sub-assemblies like main engine, hydraulic pumps, gearboxes, and motors done through OEM/authorized dealer during POH & MLR; and same shall be extended to auxiliary engine, hydraulic cylinders and valves etc. During POH/ MLR overhauling of major assemblies should be done through OEM.

AM (PU) instructed that both JMP and Parel workshops should use this method for sub-assembly overhaul during any attention to crane at workshops and put the system on a sound footing, so as to ensure proper quality and minimize on-line failures.

### 9 ENHANCEMENT OF SPEED POTENTIAL OF OLD DESIGN COWANS SHEDON CRANES

RDSO has provided details of tentative modification to relieving bogie for improving the speed potential to 100 km/hr. This involves provision of hydraulic damper and helical springs over the axle box arrangement.

It was decided that this shall be first provided on pilot basis on Erode crane to be taken up for MLR at parel in July’ 12, followed by conduct of RDSO trials. Decision for further
implementation shall be taken only after RDSO trials.

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<th><strong>POH MANUAL</strong></th>
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<td>POH manuals have been made by JMP and PR workshops. POH booklet regarding attention/replacement of individual sub-assemblies during POH/MLR is being provided to crane depots.</td>
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(Saurabh Prasad)  
Dy. CME(D) Parel  
For Chief Workshop Manager

No. PR/CRMG/2012/Minutes  
Date: 11.7.12

Copy:  
AM(PU) railway Board for kind information  
All CMEs, Zonal Railways, All CMPEs, Zonal Railways.  
CME KRCL, CWM JMP  
Dir. ME (PR-II) railway Board, dir. (MP) RDSO
10 Minutes of the 10th Crane Maintenance Group Meeting held in Railway Board on 10th December, 2013

List of officers who attended the meeting is enclosed.

A. Address by Member Mechanical:

1. The crane portal developed by Parel and Jamalpur workshops should be used extensively by all the users. Suggestions for changes and improvements, if any, should be given to the workshops on regular basis. The portals should be used for all important issues related to the cranes such as availability of spares, discussion on technical issues, calling in programme for crane POH/MLR. CWM/JMP informed that they have set up video conferencing through Skyper. At present conferencing is possible only with one user at a time. JMP should explore the possibility of multi-user conference which may be offered by Skyp through paid connection. Parel should also set up similar facilities. Both workshops should fix conference schedule so that regular communication take place.

2. All crane users should arrange for regular mock trials especially in scenarios where crane is not used for either accident or departmental work at least once in a month. These trials should involve actual lifting of stock with simulation of actual site condition like slewing of OHE etc. The trainee drivers/staff should be associated during such drills for hands on learning. Use of crane for departmental work should be done after careful and through planning involving the user departments such as Civil Engineering and Electrical Engineering.

3. JMP workshops should study and tabulate the distortions noticed in cranes taken for POH/MLR/special MLR to analyze distortions due to normal use and due to mismanagement. Based on this they should estimate the average requirement of structural work and lay down equivalent units for POH/MLR/Special MLR. This should be completed by 31st March, 2014.

4. The rate contract system for crane spares followed by Parel should be copied by ER, being superior system for such maintenance requirement. This should be in place by 2014-15.

5. CMW/JMP and Parel should study the painting schedule of railway bridges and suggest a similar schedule for breakdown cranes to prevent corrosion. CWM/JMP should also, based on experience with structural audit, suggest a suitable codal life for these cranes. This is to be completed by 31st Jan, 2014.

6. The requirement of breakdown cranes worked out by the committee of CMPEs should be incorporated in the 5 year plans at Railway Board to ensure that long term targets are kept in focus.

7. NR raised the issue of requirement of Tunnel Rescue Trains for J&K project. NR should send formal proposal for its acquisition to Railway Board.

8. CR suggested that rate contracts for hiring of road cranes and bulldozers should be in place so that if required these can be arranged at short notice. The Zonal...
Railways should try to tie-up such arrangement along with Civil Engineering as their requirement for such equipment is more frequent.

9. CMEs should regularly review crane/ART locations in view of changing traffic patterns, gauge conversion etc.

10. All Zonal Railways must look at ways and means to reduce travel time of cranes to accident site as this aspect is most often the most critical factor.

11. On request by few Railways for new coaches for ART/ARMV it was advised that they should explore the possibility of taking bare shell from ICF and furnishing it themselves.

**B. Address by Member Engineering:**

1. The needs for maintenance spares of critical equipment like breakdown cranes is very unique and Parel and Jamalpur workshops should look at unconventional methods to cut down lead time for their supply.

**C. Address by EDME (Tr):**

1. With the reduced usage of cranes for accident restoration, the challenge to keep it in ready condition in terms of equipment and manpower has increased manifold. The ownership of crane by the user is a meet this challenge.

2. Any crane failure at site and other major failures should invariably be reported on line on the portals to enable quick action as well as learning by all users.

3. Maintenance infrastructure in crane depots must be arranged without further delay.

4. Training of drivers, operations and maintenance staff should be a continuous exercise to keep their skills current.

5. All users should keep should a watch on the age profile of nominated staff for ART as well as crane to ensure that their capabilities are not affected due to overage.

6. All CME’s should report major crane failure as well as the gaps in implementation of Crane Maintenance Group minutes in their monthly PCDO from January 2014 onwards.

7. Workshops should decrease the lead time for POH/MLR with improved planning for spares etc. The overdue cranes must be liquidated within next two years.

8. There has been considerable delay at ER in procurement of spares for MLR and new crane manufacture. This should be monitored at the highest level and position reported in monthly PCDO from January 2014 onwards.

9. Parel and Jamalpur workshops should extend the use of UTEX. System as feasible for various sub-assemblies owing to its technical as well monetary benefits.
D. Discussion on Agenda points:

1. The portal usage need to be improved by most Zonal Railways. Parel should migrate the portal to internet for better accessibility. Jamalpur should use the format standardized by Parel for reporting on failures etc. Jamalpur should also post the list of available spares with each user as done by Parel.

2. The most recent major failure of KKF crane was discussed. All such failures can be mainly attributed to human error which should be tackled by training and practice. The performance of SLI should also be monitored and feedback given to the workshops and non-functioning of SLI can also attribute to major failures. A committee of JAG/SG officers from WR, JMP and RDSO should be formed to study the performance of various design/makes of SLIs, to recommend codal life as well as AMC methodology.

3. On the issue of training of new drivers, it was learnt that JMP is not giving and hands on training to them and is leaving this aspect entirely to the users. JMP should provide at least 15 days practical training which can be arranged within the workshops, if required. In addition, the age old practice of informal training of new staff by the experienced personnel as an apprentice must be continued as the same has proven to be useful over the years.

4. On the issue of root cause analysis, Danapur pointed out the failure of NG-12 valve for counter weight. This should be studied by Jamalpur. JMP should also study the issues on KGP crane and make a joint note on problems being faced by the Railway in working in FOR conditions.

5. On the issue of covered sheds for cranes, users generally cited the constraints of funds/sanctions and request Railway Board to highlight the issue at the highest level. RDSO will wait for feedback of Zonal Railways on improvements in standard infrastructure and issue the revised instructions accordingly by 31st March, 2014.

6. RDSO should study the performance of new design SLIs and freeze the specifications by 31st January, 2014.

7. The main reason for overdue POH/MLR at Parel as well as on JMP is the non-availability of capital spares. The constraints must be resolved at the earliest and overdue liquidated latest by 2015-16.

8. JMP should manufacture four new cranes allotted to them in 2014-15.
E. Issues related to M/s Cummins:

1. In view of very high overhauling cost quoted by M/s Cummins for 743 engines, Parel should explore the option of replacement of engine with a new one. For this purpose manufacturers other than Cummins should also be considered.
2. M/s Cummins will provide the option of comprehensive as well as non-comprehensive AMC to the users based on which individual depots can decide the type of AMC to be opted.
3. M/s Cummins will ensure that lead time for engine overhaul including to and fro transportation does not exceed 3 months.
4. The issue of poor response from M/s Cummins authorized dealers were raised by SWR, NFR, SCR and WR. M/s Cummins would look into these and reply by 15th January.

F. Discussion with M/s PS Engineering and M/s Indtel:

1. The AMC offered for hydraulics and pneumatics is service based only. Hence stocking of adequate spares should be ensured by Railways/Workshops. JMP will take a census of Gottwald spares available with various users and put it up on the portal to ensure that unnecessary stocking does not take place.
2. M/s Rexroth will provide an offer for setting up the centre of excellence of Simulators and Pneumatics at JMP by 31st January, 2014.
3. Parel is already getting the hydraulic pumps overhauled through OEM and is in the process of establishing a contract for cylinders. Jamalpur workshop should start similar activities within next six months.

G. Other Issues:

1. The policy letters of 3-Coach SPART were discussed and doubts raised by Zonal Railways were clarified by Railway Board.
2. NWR, SER and SR shall gear up for POH of old SPART engines and transmissions in full fledged.
3. Presentation of Portable Plasma Cutting Equipment for ARTs was made and the doubts of Zonal Railways were clarified. Demonstration of equipment will be arranged by the vendor as per request given by Zonal Railways to them directly.

(Manish Jain)
Director Mech. Engg. (P) II
Railway Board

No. 96/M(M&P)/175/3/A/T-Vol.II New Delhi, dated 08 January, 2014

Copy to: DG/RDSO
CMEs/all Zonal Railways
CWMs/JMP, Parel

Compendium on Crane maintenance-Group meetings for Instructions on 140 T Cranes
List of officers who attend the 10th Crane Maintenance Group Meeting held in Railway Board on 10th December, 2013

1. Shri Arvind Khare, AM (PU), Railway Board.
2. Shri Vivek Kumar, EDME (Tr.), Railway Board
3. Shri Nitin Chowdhary, EDME(Dev.)/Railway Board.
4. Shri Shailendra Singh, EDME/Chg./Railway Board.
5. Shri Manish Jain, DME (P) II, Railway Board.
6. Shri Angshumali Rastogi, DME (PU), Railway Board.
7. Shri Shoaib Jamal, DME/BSL/CR
8. Shri V.T. Ganbhiye, AEME/CR
9. Shri Saurat Prasad, dy. CME/PR./CR
10. Shri Rakesh Bahl, CRSE/WR
11. Shri C.P. Sharma, Dy. CME/Chart/JMP/ER
12. Shri Rakesh Bahl, CMPE/Dsl/CR
13. Shri Shyamadhar Ram, SWR
14. Shri G.A. Jillam, Sr. DME/C&W/SER
15. Shri R. Arora, CMPE/SER
16. Shri T.S.N Murty, Dy. CME/R&L/NER
17. Shri K.S. Chandra, NWR
18. Shri E. Tigga, CMPE/O&F/NFR
19. Shri Dharmesh Kumar Khare, Sr. DME/Dsl/GD/NER
20. Shri A. K. Gupta, CMPE/Dsl/NCR
21. Shri Arun Arora, CMEP/NR
22. Shri Arjun Mundiya, CMPE/ECoR
23. Shri R.R. Jha, CMPE/ECR
24. Shri P.C. gupta, CMPE/WCR
25. Shri S.P. Sonkuware, Dy. CME/Dsl/SECR
26. Shri Suman Kumar Tonti, Sr. DME/WCR
27. Shri M. Rajendra Pandian, ADME/P/SR
28. Shri Surya Prakash Srivastava, ADME/P/ECR
29. Shri raveendran, Sr. DME/O&F/SECR
30. Shri Vinit Singhal, Sr. DME/WAT/ECor
31. Shri B.C. roy, Sr. DME/HWH/ER
32. Shri V.K. Gautam, Sr. DME/ALD/NCR
33. Shri A. Gupta, Sr. DME/TSK/NFR
34. Shri P.K. Sharma, Dy. CME/R&F/NER
11. Minutes of the 11\textsuperscript{th} Crane Maintenance Group Meeting held at RDSO on 11\textsuperscript{th} February’2016

A. Address by AM (ME)

1. Zonal Railways must ensure regular monthly mock drills in yards, simulating the actual accident site conditions and a proper record of these drills shall be maintained.
2. Over aged cranes shall be kept in working order until replacements are arranged. JMP to ensure production of new cranes as per their production programme. JMP advised to ensure out turn of two cranes in year 2016 as committed.
3. As M/s Gottwald has been down their business, JMP must look for some more competent sources of repute.
4. Parel & Jamalpur workshop have to ensure proper in time MLR/rehab of the crane. Workshops should ensure right quality spares.
5. Jamalpur Workshop should enter into AMC for Engine and SLI for the new manufactured crane spares and AMC of SLI should be done by respective OEM being a safety item.
6. AM/ME emphasized Workshops (JMP & Parel) on timely delivery of quality services, products and spares and become more goal oriented.

B. Address by EDME (Tr.):

1. 7\textsuperscript{th} Pay Commission has abolished the breakdown. A Secretary level committee has been formed to review the recommendations of 7\textsuperscript{th} Pay Commission. Chairman, Railway Board is the member of the committee. Mech. dte. Of Board has submitted the recommendations regarding enhancement of BD allowances to 10\% of basic pay to Pay Commission Directorate. Zonal Railways should send their representations through GMs directly to Chairman, Railway Board for restoring the breakdown allowance, since breakdown staff shall be available to duly on short notice and work in adverse condition.
2. Unit exchange assemblies shall be kept in readiness in JMP & PR for supply to reduce the down time of BD cranes. Workshops should submit their demand for unit exchange assemblies/spare parts of POH to Railway Board for RSP sanction.
3. As accidents have reduced, there is a great need for mock drills and training of BD staff.
4. JMP workshop shall reduce the POH cycle time of 140 t BD cranes.
5. Policy for upgradation of cranes – The upgradation to be done in cranes during MLR & spl. MLR should laid down by RDSO.
6. Rate contract for spares exist Parel Workshop. However, LC not yet opened. Parel & JMP workshops are lagging on ordering spare parts.
C. Inauguration of books/manuals prepared by CAMTECH, Gwalior:

AM (ME)/RB, EDME/RB & ADG/RDSO inaugurated following four books/manuals prepared by CAMTECH, Gwalior:

1. Operation & maintenance manual for ART/ARMV and 140 T breakdown crane.
2. Handbook on Restoration by 140 T breakdown crane.
3. Handbook on Restoration by Hydraulic re-railing equipment.
4. Handbook on Rescue & Relief operations by Hydraulic Rescue Device (HRD)/Electrically operated equipment.

D. DISCUSSION ON ATR 10th CRMG

1. Use of crane portal by users – Use of crane portal developed by JMP and PR for all important issues by crane users. JMP submitted that 34 crane sites are using portal out of 58 crane sites. All users shall have internet connectivity and use the portal for their day to day issues for seamless communication with JMP.

2. JMP has received an order from Railway Board to manufacture 9 cranes. Material is under procurement for 4 cranes and for the balance 5 cranes, estimate is under vetting. JMP shall expedite the production process.

3. NR has been advised to send a formal proposal to Railway Board for Tunnel Rescue Equipment by 30th April 2016.

4. Hiring of Road Cranes & Bulldozers - Power shall be delegated to Divisional officers for hiring of road cranes and bulldozers for rescue. Some Zonal Railways like SCR is already having a liberal SOP facilitating the Divisional Mechanical Officers to hire read mobile cranes. Railway Board shall obtain SOP of SCR and NCR for study and issue guidelines to Zonal Railways.

5. Requirement of Cranes of BD Special – Zonal Railways shall ask for new coaches for BD Special through RSP instead of converting over aged stock.

6. Civil & Electrical infrastructure in base depots of Crane – Zonal Railways shall continuously pursue GMs/DRMs for sanction of infrastructure works under PH-42. In case of non-availability of adequate funds in PH-42, Zonal Railways shall propose works under safety.

7. Parel Workshop has done an extensive study on the spectrographic analysis of hydraulic oil to know the condition of the moving parts of hydraulic equipment. Parel shall publish a report for use by Zonal Railways.

8. RDSO shall issue specification of SLI system based on the Parel input by the end of March 2016.
9. M/s Rexroth submitted a proposal for setting up Centre of Excellence of Simulations and pneumatics to JMP, RDSO shall provide necessary guidance to JMP by holding a meeting with M/s Rexroth and JMP at RDSO.

10. There is conflicting feedback on the performance of Portable Plasma Cutting machine during the trial. DME/P-II shall conduct a meeting with COFMOW and resolve the issues related to Portable Plasma Cutting equipment for Rescue involving couple of Zonal Railways.

11. **Use of PU paint** – Parel Workshop has started PU painting of cranes through works contract to RDSO specification. JMP shall also start PU painting of new/POHed cranes.

12. **RC for spares** – Railway Board expressed dissatisfaction on the slow progress of finalizing Rate Contract for spares by JMP. A detailed note shall be prepared by JMP and sent to Railway Board immediately. A monthly feedback on the progress shall be sent to Railway Board through PCDO.

13. Suggestions for revisions in maintenance instructions issued by RDSO to be send by email at crmgrdso@gmail.com.

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**E. Discussion on Railway Board’s Agenda Points :**

1. **Fund expenditure & requirement** : AM (ME) said that Zonal Railways should have submitted fund requirement to Board by Dec.’15. Railways should pursue their proposal for fund requirement for infrastructure at GM level with proper justification. Wherever, fund has already been allotted, the expenditure shall be booked at the earliest and all efforts to be made for accomplishment of work keeping in view the importance of requisite facilities for better upkeep of the crane. RDSO’s guidelines for infrastructure facilities for cranes to be re-iterated.

2. **Rate contract status** : Parel workshop has already finalized rate contract for spares. JMP workshop is lagging behind and should finalize it by 31st July 2016. ER informed that some parties who are interested for RC, have quoted 80% higher than regular price. Further, JMP workshop was advised to make provision for 20% extra quantity spares alongwith new procurement.

3. Parel should ensure 2 crane sets of unit exchange/emergency spares for old design and 1 crane set for new design Cowns Shedon cranes at all times which can be pooled between Workshop and depots. Jamalpur should also keep 5 sets of spares for Gottwald cranes for Railways.

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**F. Issues related to AMC :**

**JMP W/s :**

1. JMP informed the forum that vendors are not agreeing for AMC of hydraulic & pneumatic systems. AM (ME) advised JMP to conduct a meeting with M/s Rexroth regarding the same by 29.02.2016. Also, THE TENDER SHOULD...
HAVE CLAUSE TO ACCOMMODATE CLOSURE OF OBSOLETE ITEMS. JMP SHOULD REVIEW THE MATTER.

2. Scope of AMC for engine and SLI from respective OEM only should be standardized so that it becomes uniform for all Railways. NWR shall prepare a scope for AMC of engine in consultation with Cummins and also finalize the rate contract and communicate the same to Zonal Railways. Similarly Parel shall finalize the scope of AMC for SLI from respective OEM only by 31.03.2016.

3. RDSO has issued MOM indicating codal life of 5-8 years for SLI based on feedback of Zonal Railways. Longer AMC period will reduce the cost of AMC.

4. Zonal Railways shall give feedback for implementation of must change items in POH. The list shall be reviewed and updated by RDSO in next three months.

Parel W/S :

1. PR workshop gave a presentation on POH/MLR of the cranes and attracted the attention of the forum towards the heavy corrosion of the undercarriage structures observed on cranes after turning the structure upside down. Match truck, Ballast truck, Crane bogies and Relieving bogies should be given thorough examination and attention during MLR. Similar type of action was advised to JMP workshop also specially for cranes undertaken for Special MLR.

2. NCR raised the issue of obsolescence of auxiliary engine on Cowans Sheldon cranes. Parel has planned replacement of Auxiliary engine which should be completed within next one year on all old design Cowans cranes.

3. Parel should replace the obsolete main engine, derrick-tie cylinders and rotary column, obsolete electrical slip ring unit and improve hoisting speeds during MLR. However, up gradation of brake system and bogies should not be undertaken since they have completed major service life only 12 such cranes of old design exist.

G. Reporting of Minor failures “on site/offsite” to JMP :

It is observed that only ECR, ER & NFR reported failures to JMP. It was advised that all Zonal Railways shall report both “ON SITE and OFF SITE” failures along with all other technical issues arising out of day to day maintenance to JMP & PR for developing data base for taking appropriate corrective and preventive action to improve overall reliability of the BD cranes. A yearly report on failures and other technical issues along with suggested corrective and preventive action shall be published by both the workshops.
H. Reporting of Minor failures “on site/offsite” to JMP:

1. JMP shall conduct a training course for induction of new Crane Drivers. Theoretical training shall be imparted to concerned staff at JMP and practical “Hands on” training at a nearby location on similar design of Gottwald crane. A competency certificate with validity and due date for attending next course should also be given after completion of the successful training at JMP workshop.

2. Refresher Course: A refresher course for crane drivers on operation and troubleshooting shall be done once in 3 years. JMP and Parel workshop shall prepare the module for refresher of Gottwald and Cowans Sheldon cranes respectively and plan the courses immediately.

3. Training of Maintenance staff: Following maintenance staff of breakdown crane shall be given a refresher course once in 3 years in JMP W/s & Parel W/s on various assemblies and maintenance aspects for Gottwald & Cowans Sheldon design cranes respectively.
   (i). Existing drivers.
   (ii). Refresher course for JEs/SSEs maintaining the crane.
   (iii). For new staff including drivers, JEs, SSEs involved in crane maintenance.

I. Overdue POH/MLR and Action Plan to liquidate:

1. JMP W/s: JMP W/s stated that they will conduct structural audit & special MLR of remaining 3 Gottwald cranes (i.e 142034 of KUR/ECoR, 142037 of HWH/ER & 142040 of LDH/NR) during 2016-17.

2. Parel W/s: Parel W/s stated that all eight overdue MLR cranes shall be given by MLR by Dec’2017. One (JP/NWR) crane is in the workshop for MLR & remaining two (ET/WCR & JHS/NCR) are to be done this year. During this structural audit should be done since cranes are now more than 26 years old. Regarding Kankaria crane, MLR was done when crane was 24 years old, and now 26 years service life has been completed. WR requested for structural audit & retro-fitment of main engine. This should be programmed.

3. Issues related to spares:
   (i). JMP will cover 20% extra spares in addition to their regular manufacturing.
   (ii). ECoR reported that approved vendors of chain and ropes are not quoting in their tenders citing rate issues. It was advised that rope & chain being a safety item should be purchased through AMC.
   (iii). Keeping in mind the issues related to CBC, it has been decided by the forum that screw coupling shall continue as it is and the item is closed.
J. Rate Contract:

SER was asked to finalize rate contract for overhauling of engine, transmission unit and compressor for SPARTs during POH for all Railways about three years back, but till date nothing has been done. It has now been decided that NWR will finalize the rate contract for the above mentioned items for all the Railways.

K. Issues related to M/s Cummins:

1. M/s Cummins gave a presentation on details of CAMC & AMC of their engines. M/s CIL stated that CAMC (Comprehensive AMC) covers preventive & breakdown maintenance including all oil & filter change responsibility to ensure reliability & availability of engine whereas AMC covers only breakdown maintenance as and when required and often gets delayed due to procurement of required spares by concerned Zonal Railways due to laid down procedure. Railway owns the responsibility for oil & filter change in case of AMC.

2. NWR advised to finalize & carryout CAMC rate contract for all Zonal Railways based on CIL’s proposal.

3. M/s CIL will send their representatives to Guwahati for health check-up of the crane and also resolve the NCR’s problem pertaining to issues with local dealer.

L. Discussion with P S Engineering:

1. PS engineering is not authorized representative for hydraulic & pneumatic systems but has vast experience since their one engineer was earlier associated with M/s Gottwald & was key personnel in commissioning & manufacturing of similar design of cranes at JMP. However, JMP informed that P S Engineering was never approved as an authorized agency for AMC by JMP workshop.

2. PS Engineering stated that they are capable of doing complete maintenance of Gottwald design cranes buffer except Engine & SLI. They also told the forum that they can carry out maintenance of Cowans crane as well, if entrusted. However, they are keeping themselves.

M. Discussion with M/s Agromach:

1. M/s Agromach told that their firm is capable of supplying spares of any cost may be from lowest to highest value and has also supplied Zonal Railways. There is no supply related issue except for Kankaria crane where 2 Pos are pending for 3 nos. and shall be executed after receipt of supply from M/s Rexroth, Germany.