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सत्यमेव जयते

भारत सरकार–रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ– 226011
Government of India - Ministry of Railways
Research, Designs & Standards Organization,
Lucknow – 226011

No. EL/2.2.13 **Date: 24.01.2020**

प्रमुख विद्युत अभियंता,	**Principal Chief Electrical Engineers,**
1. मध्य रेलवे, मुम्बई सीएसटी–400 001	1. Central Railway, Mumbai, CST-400 001.
2. पूर्व मध्य रेलवे, हाजीपुर–844 101	2. East Central Railway, Hazipur-844 101.
3. पूर्वतटीय रेलवे, चन्द्रषेखरपुर, भुबनेश्वर–751 017	3. East Coast Railway, Chandrashekharpur, Bhubaneshwar -751 017
4. पूर्वरेलवे, फेयर्लीप्लेस, कोलकाता–700 001	4. Eastern Railway, Fairlie Place, Calcutta-700 001.
5. उत्तर मध्य रेलवे, ब्लाक ए–2, सुबेदारगंज इलाहाबाद–211 033	5. North Central Railway, Block-A, Subedarganj, Allahabad- 211 033.
6. उत्तर रेलवे, बड़ौदा हाऊस, नई दिल्ली–110 001	6. Northern Railway, Baroda House, New Delhi-110 001.
7. उत्तर पश्चिम रेलवे जयपुर– 302006	7. North Western Railway, Jaipur- 302 006
8. उत्तर पूर्व रेलवे गोरखपुर– 273001	8. North Eastern Railway, Gorakhpur-273001
9. उत्तर पूर्व फ्रेन्टीयर रेलवे मालीगॉव गुवाहाटी–781011	9. North East Frontier Railway, Maligaon, Guwahati-781011
10.दक्षिण मध्य रेलवे, रेल निलायम, सिकंदराबाद–500 371	10. South Central Railway, Rail Nilayam Secunderabad-500 071.
11.दक्षिण पूर्व मध्य रेलवे, बिलासपुर– 495 004	11. South East Central Railway, Bilaspur-495 004.
12.दक्षिण पूर्व रेलवे, गार्डेनरीच, कोलकाता–700 043	12. South Eastern Railway, Garden Reach, Kolkata-700 043.
13.दक्षिण रेलवे, पार्कटाउन, चेन्नई–600 003	13. Southern Railway, Park Town, Chennai-600 003.
14.दक्षिण पश्चिम रेलवे हुबली–580020	14. South Western Railway, Hubli- 580020
15.पश्चिम मध्य रेलवे, जबलपुर–482 001	15. West Central Railway, Jabalpur-482 001.
16.पश्चिमरेलवे, चर्चगेट, मुम्बई– 400 020	16. Western Railway, Churchgate, Mumbai-400 020
17.चित्तरंजन रेल इंजन कारखाना, चित्तरंजन– 713 331	17. Chittaranjan Locomotive Works, Chittaranjan-713 331
18. डीजल रेल इंजन कारखाना, वाराणसी–221004	18. Diesel Locomotive Works, Varanasi-221 004.

Sub: Minutes of Meeting of 'Axle lock incidences on Three Phase Electric Locomotives' held at SER/HQ on 10.01.2020 & at ELS/SRC on 11.01.2020.

Ref: Railway Board's letter no. 2006/Elect(TRS)/441/8 Pt. dated 6.1.2020

1. Meeting of 'Axle lock incidences on Three Phase Electric Locomotives' was held at SER/HQ on 10.01.2020 & at ELS/SRC on 11.01.2020 to discuss the issue and to draw the action plan along with review of maintenance practices for prevention of axle lock cases.

2. Minutes of Meeting had been issued and uploaded on RDSO website and it may be downloaded using following path:-

www.rdso.indianrailways.gov.in → Directorates → Electric Loco → Other Important Links →Reliability Meetings →TM/MSU/Bearings.

24.1.2020

(P. K. Saraswat)
for Director General/ Electrical

Copy to:

Secretary (Traction), Railway Board, Rail Bhawan, New Delhi-110 001**(Kind Attn. Shri Kishore Vaibhav, DEE/RS)**	- For kind information please
M/s Bharat Heavy Electricals Limited, Traction Machine Engg. Division, Piplani, Bhopal-462022	- For information and necessary action please
M/s CG Power and Industrial Solutions Limited,Traction Electronics Division, Plot No.9, MPAKVN Phase-2, New Industrial Area, Mandideep- 462046 (Bhopal)	
M/s Saini Electrical & Engineering works, A/751/1,T.T.C Industrial area, MIDC, Pawne, Navi Mumbai-400705	
M/s ABB Limited, Survey no. 109,110, Near Shiva Temple, Behind Kingfisher Factory Road, Village-Vavanje, MIDC Taloja, Dist.-Rajgad-410 208, Maharashtra	
M/s Kirloskar Electric Company Limited, Post Box No.5555,Malleswaram, West angaluru-560 055	
M/s Bharat Bijlee Limited, No.2 Thane-Belapur Road, Airoli, Navi Mumbai-400708	
M/s Medha Traction Equipment Pvt Ltd, Sy.No.787,788,790& 791,Jodimetla X Roads, Chowdaryguda Village, Ghatkesar Mandal, Hyderabad-500088 (AP)	
M/s CRRC Pioneer Electric India Pvt Ltd, Plot No. 177-178, Sector-4, G.C, Bawal Rewari, Haryana-123501	
M/s WEG Industries India Pvt Ltd, Plot No. E20 (North) Sipcot Industrial Complex Phase-II EX-II Mornapalli Hosur Krishnagiri-635109	

24.1.2020

(P. K. Saraswat)
for Director General/ Electrical

Minutes of Meeting of 'Axle lock incidences on Three Phase Electric Locomotives' held at SER/HQ on 10.01.2020 & at ELS/SRC on 11.01.2020

1. **Present:** As per list enclosed as Annexure - I
2. At the outset, CELE/SER welcomed all the participants of the meeting.
3. EDEE (RS) shown his concern over the grave situation of large increase in number of axle lock cases on line and advised Zonal Railways and production units to take all the necessary actions to improve the reliability and to minimize failures. Zonal Railways were advised to monitor the Head On Generation (HOG) converter working in trains. All HOG compliant rakes must work with HOG fitted locomotives and an analysis is required regarding exact reasons of non-working of HOG. Zonal Railways should endeavors to reduce the diesel train operation under wire as it will accrue tremendous benefit to Railways. He advised sheds to focus on cause of unscheduled arising and told to give full attention during scheduled visits so that unscheduled arising do not come. He advised Sr. DEEs to ensure that M&P of shed should never be out of order and sheds should try to convert Non-Stock items of regular and critical nature to stock item category. Sheds should enter into works contract only with proper analysis and number of works contracts needs to be reduced and while entering into works contract/AMC, Railways shall not forego their expertise of maintenance. He further stressed that FOIS is the final portal as far availability of locomotives is concerned and advised that availability of locomotives must matches with those in FOIS.
4. During the meeting, axle lock incidences of 2019-20 and TM & MSU bearing failures of 2018-19 were discussed.
5. **Analysis of Axle Lock Cases of three phase locomotives of 2019-20**

   5.1. The details of axle lock cases as received from Zonal Railways are attached as annexure II.

   5.2. Total 77 axle lock cases had been reported and summarized as below:

Rly	Shed	WAG9		WAP7			WAP5	Total
		TM	MSU	TM	MSU	AB	GC	
CR	AQ	6	1	0	2			9
	KYN	4						4
	BSL	1						1
ER	HWH			1				1
NCR	CNB	10		1				11
NR	LDH	9	1					10
	GZB			3			3	6
SCR	KZJ & LGD	10	1					11

Rly	Shed	WAG9		WAP7			WAP5	Total
		TM	MSU	TM	MSU	AB	GC	
ECoR	WAT	0	1	1	0			2
SR	RPM	0		1	1			2
SECR	BIA	4		1				5
WCR	TKD	1			2			3
	NKJ	2						2
ECR	GMO	3				1		4
	BJU	4						4
WR	BRC						2	2
Total		54	4	8	5	1	5	77

5.3. Production Unit wise and loco type wise distribution of these 77 cases is given below:

PU	WAG9	WAP7	WAP5	Total
CLW	57	10	5	72
DLW	1	3		4
DMW		1		1
Total	**58**	**14**	**5**	**77**

5.4. Equipment wise distribution of these 77 cases is given below:

Equip.	Side	WAG9	WAP7	WAP5	Total
TM	DE	51	6		57
	NDE	2	2		4
	Not Specified	1			1
MSU		4	5		9
Axle Box			1		1
Gear Case				5	5
Total		58	14	5	77

5.5. Bearing make wise distribution of these 77 cases is given below:

Make	WAG9	WAP7	WAP5	Total
SKF	29	4	0	33
FAG	17	3	0	20
Timken	0	0	5	5
Make Not Specified	12	7	0	19
Total	**58**	**14**	**5**	**77**

5.6. Age wise analysis (from date of commissioning to date of failure) of 72 cases of CLW locomotives is given below:

Loco	<30D	30 to 180D	180 to 365D	1Y to 2 Y	2Y to 3Y	3Y to 4 Y	4Yto 5 Y	5Y to 6Y	6Y to 7Y	> 7Y	Total
WAG9	11	14	10	7	4	3	4	1	1	2	57
WAP7	0	1	1	3	1	1	1	0	0	2	10
WAP5	0	2	0	1	0	1	1	0	0	0	5
Total	**11**	**17**	**11**	**11**	**5**	**5**	**6**	**1**	**1**	**4**	**72**

It is observed that 11 cases are within first month of commissioning and total 39 cases are within one year of commissioning.

5.7. Age wise analysis (from date of commissioning to date of failure) of 5 cases of DLW/DMW locomotives is given below:

PUs	Loco	30 to 180D	180 to 365D	Total
DLW	WAG9	0	1	1
	WAP7	1	2	3
DMW	WAP7	0	1	1
Total		1	4	5

It is observed that all 5 cases are within one year of commissioning.

5.8. Failed Equipment wise Age wise analysis (from date of commissioning to date of failure) of all 77 axle lock cases is given below:

Equip.	<30D	30 to 180D	180 to 365D	1Y to 2 Y	2Y to 3Y	3Y to 4 Y	4Y to 5 Y	5Y to 6Y	6Y to 7Y	> 7Y	Total
TM	11	16	14	7	2	4	5	1	1	1	62
MSU				3	3					3	9
AB			1								1
GC		2		1		1	1				5
Total	**11**	**18**	**15**	**11**	**5**	**5**	**6**	**1**	**1**	**4**	**77**

It is observed that 11 cases are within first month of commissioning and 44 cases out of total 77 cases are within one year of commissioning.

5.9. For the 72 cases involving CLW locomotives, it was not clear whether traction motors were manufactured by CLW or procured from the approved sources. CLW to examine further and submit the details to RDSO. CLW should take necessary steps to improve the manufacturing practices.

5.10. From the deliberations during the meeting, it came out that large numbers of failures are due to grease starvation in bearing. CLW is not carrying full greasing during manufacturing and problem of oil ingress in traction motors is aggravating the problem. Failures are also due to fitment issues and not ensuring the proper interferences by measurements of mating components by CLW and other TM manufacturers.

6. Important Instructions issued by RDSO to improve the reliability of 3-Phase TM & MSU bearings.

6.1. TM Bearings are essentially maintenance free. No maintenance is prescribed during IT, IA/IB. Lubrication with specified quantity of specified grease is prescribed during IC & MOH. Replacement of TM bearings (DE+NDE) is prescribed during IOH &POH. Proper handling & fitment as per ABB Maintenance manual and lubrication of the bearings as per SMI-307 needs to be ensured.

6.2. Fitment of bearing of 3-phase TM type 6FRA6068 shall be as per SMI-278 dated 23.12.2013.

6.3. List of important instructions issued by RDSO related to TM & MSU bearings is given below:

SN	Date	About
SMI-324	24.08.2018	Use of Portable oil dust checker (Metal content checker) for condition monitoring of Gear case oil.
SMI-323	20.08.2018	Procedure of measurement of axial clearance and limit of axial clearance for traction motor type 6FRA6068.
SMI-322	27.04.2018	Use of grease gun equipped with digital grease meter
SMI-318	16.10.2017	Use of Bore Gauge for measurement of internal diameters
SMI-314	29.9.2017	Use of Dial Snap Gauges for measurement of shaft diameter
SMI-307	5.6.2017	Revision of the periodicity of re-greasing in minor schedule from existing IC schedule to every alternate schedule (i.e. Ist IB, 2nd IA, 2nd IC) for Traction Motor (TM) bearings of 6FRA6068 TM
SMI-306	17.4.2017	Induction heating of MSU for bearing fitment
SMI-301	8.11.2016	Use of Induction Heater for heating of End Shields for bearing fitment
SMI-300	2.11.2016	Defining periodicity of overhauling schedule of MSU of WAG9/WAG9H/WAP7 locomotives
SMI-278	24.12.2013	Fitment procedure of TM 6FRA6068 DE bearings
MS-478	30.7.2019	Adoption of Traction motor labyrinths of TM type 6FRA6068 as per original dimensions given by ABB to eliminate problem of gear case oil ingress in TM.
MS-415 Amend.3 Rev 1	2.7.2019	Modified interferences between TM assembly components, in order to ensure adequate interference between assembly components of traction motor type 6FRA6068
MS-466	15.11.2017	Modification in drawing of Outer bearing cap DE to achieve adequate lateral thrust in Traction motor(TM) assembly of 6FRA6068 TM
MS-460	12.06.2017	Modification in drawing of bearing cap NDE to achieve adequate lateral thrust in Traction motor(TM) assembly of 6FRA6068
MS-456	9.1.2017	Modification in drawing of supporting ring to achieve adequate 'C' Clearance in MSU assembly of 6FRA-6068 TM
MS-439	23.11.2016	Modification in drawing of Outer Bearing Cap (DE) to drain out ingressed gear case oil from TM type 6FRA6068.
TC-151	24.04.2019	Technical Circular for measurement of 'C' Clearance in MSU assembly of 6FRA-6068 Traction motors in WAG/WAP7 class Locomotives
TC-123	23.9.2014	Must Change Items in POH
TC-117 Rev.1	28.09.2018	Technical Circular on Year of manufacturing codification on TM & MSU Bearings.
TC-104	16.7.2010	Storage & Handling of Lubricants

7 **Issues deliberated in the meeting:**

7.1 It was informed by the sheds that greasing is not adequate in new locomotives and it may be a cause of axle seizures. Some of the sheds are following practice of full greasing during first IC schedule in new locomotives.

7.2 Cases have been reported by sheds where they are not finding the required dimensions/interferences in the mating components which may be a cause of axle seizures.

7.3 EL/GMO & HWH informed that they had rejected bearings due to less free Radial Clearance. It was also informed that inspection quality of RITES is not proper and sheds have rejected some bearings due to rusting. Sheds are requested to share the details/joint notes made with firm for further action.

7.4 SER had informed that they are following practice of metal content checking in first schedule after overhaul/ commissioning of the locomotive.

7.5 ELS/HWH informed that if prescribed quantity of grease is provided, no grease is collected at outlet for collection of grease sample for metal content checking and there is need to develop other means for collecting the sample of grease. However, if full greasing till outlet is carried out, there is no issue in collecting the samples.

7.6 SER informed that they are monitoring traction motor temperatures during run test using data loggers. Other Zonal Railways may also examine and adopt the similar practice.

7.7 It was informed by sheds that initially, for full greasing till outlet, about 1 to 1.2 Kg grease is required, however, subsequently, this quantity is reduced.

7.8 It was suggested by sheds that RSP may be sanctioned for bulk procurement of labyrinths as per original ABB dimensions as advised vide Modification Sheet no. 478 dated 30.7.2019. Railways were advised to give their requirements to Railway Board.

7.9 Some of the sheds had reported rusting of end cover. CLW is advised to check the material composition on random basis for SGCI.

7.10 It has been reported that some of the approved firms of CLW are not following QAP for 100% measurement of assembly components on CMM. All inspecting agencies, including CLW, DLW, DMW, etc. must ensure 100% measurement records of CMM, while accepting the material as mentioned in QAP.

7.11 Further, there have been instances that many recently approved firms don't have approved QAP and they have been supplying materials. CLW informed that they have submitted QAPs, which are under approval. This is matter of serious concern as far quality of material is concerned. Sheds are of the opinion that QAPs of all the items shall be approved by RDSO and CLW to ensure that QAP of firm is approved before approval of the firm.

7.12 Sheds to give compliance of SMI/MS/TC in their PCDO.

7.13 Zonal Railways are also requested to give suggestions for review of SMI/MS/TC to RDSO within 15 days.

7.14 It was suggested by some of the Railways to explore the possibility of supplying grease SHC-120 in 20Kg barrels by IOCL instead of big drums.

7.15 SER informed that, air supply for grease gun is taken from air dryers, and air dryers of the shop floor are maintained by pneumatic section and IOH kit is replaced during AOH of air dryers provided on shop floor due to heavy uses. Cleaning of grease gun is carried out every 6 months and pipe line is replaced every year to ensure pipe line remains neat and clean. Cleaning of front portion of grease gun is important and needs to be ensured. This is a good practice and may be followed by other sheds.

7.16 SCR suggested that Air-dryer provided in compressor air system of shed to be over hauled periodically and due point to be measured for ensuring dry air for greasing of Axle Box/TM/MSU. Further, PRV with filter should be provided at the outlet of pneumatic pipelines for draining out the moisture.

7.17 ELS/GMO requested to provide recommended Unit Exchange Spares (UES) along with the new locos.

7.18 In order to overcome the problems of abnormal sound in traction motor, when tested along with wheel sets, CLW informed that it had modified the diameter of holes in end frame from 22 mm to 21 mm as 20 mm bolt is provided, and it has started use of centre bolts to ensure proper centering and alignment. The need for changing the hole diameter may be examined critically by CLW. Many sheds didn't report any such problem, in general. The need for changing the hole diameter may be examined critically by CLW by calling for CMM measurement records of 100% items during inspection, randomly checking a few on CMM in CLW. Further, TMs which are giving abnormal sound during testing, CMM measurement records of their components along with those of MSUs and complete MSUs shall be examined. A report in this regard shall be sent to RDSO before carrying out any such modification.

7.19 It was informed that axle box shed arisings are more. Sheds are requested to send the data to RDSO for further analysis. Normally, axle boxes along with bearings are supplied pre-lubricated, where lubrication may not remain adequate/proper due to long storage. All PUs must carry out full greasing as done in loco shed even in axle boxes at the time of manufacturing.

7.20 Issue of journal diameter of axle was reported by some sheds in DLW locos. Cases are there when loose lip is not coming out. Cases of loose lip crack are also reported. DLW to investigate further. RDSO will also carry out technical audit of DLW for mechanical items like axles box etc.

7.21 ELS/Tata informed that 26 locomotives are running satisfactorily with labyrinths as per original ABB dimensions and problem of oil ingress is not observed in those locomotives. ELS/Tata is carrying out greasing till outlet in IC0 in new locomotives.

7.22 ELS/Tata informed that in loco 37187 received from DLW, no grease was there in axle box. DLW to investigate further.

7.23 ELS/Tata informed that they had modified the drawing of O ring used in DE side labyrinth and it had helped them to reduce the oil ingress problem in existing locomotives. Further, jacking holes of end frame needs to be sealed to reduce the oil ingress. SER is requested to share the drawing of O ring with CLW, RDSO and other Railways.

7.24 DLW informed that flame heating of MSU is done for bearing fitment. DLW is advised to use induction heater for the same and till the time suitable induction heater is procured, at least use multiple burners for uniform heating.

7.25 There is need to standardize the anti-rust coating as different manufacturers are using different colour anti-rust coatings. CLW to examine the issue.

7.26 ELS/AQ informed several cases of undersize end frames. CLW to investigate the issue further and also arrange for SGCI testing from the failed end frames at ELS/AQ.

7.27 It is also suggested to sheds to carry out dimensional checking in few healthy traction motors prematurely before overhaul/during overhaul especially for End Frame DE & NDE and Outer Bearing Cap DE & NDE.

7.28 ELS/KYN reported 3 failure cases of BHEL traction motors. ELS/KYN requested to share the details so that joint inspection may be carried out by RDSO/BPL.

7.29 ELS/LDH had reported some cases of dimensional deviations in assembly components. ELS/LDH to provide details to CLW and CLW should ask for CMM records for those traction motors.

7.30 ELS/LDH informed that it is doing full greasing in IC0, full greasing every 6 months for DE side bearing and 140 g grease in NDE bearing every 6 months.

7.31 CLW is advised to carry out dimensional measurements of assembly components on CMM on few traction motors in which problem of oil ingress is reported to examine the root cause of the issue. ELS/LDH reported oil ingress problem in TM 2, 5 & 6 of loco 32224 & TM 1, 6 of loco 31663.

7.32 It was recommended that shed supervisors should visit other sheds for at least one week to observe the best practices of other sheds.

7.33 SCR informed that, there are 9 cases of TM bearing seizures of KZJ shed, 7 incidences of new commissioned locos in which 2 cases happened even before commissioning of the locomotives. Another two cases of unmodified roller FAG bearings of 2015. It was informed that greasing till outlet had not been carried out in these locos due to non-availability of grease. KZJ has now started practice of greasing till outlet in new locos during IC0.

7.34 A case of bearing spalling was reported by ELS/LGD to M/s SKF. ELS/LGD to share the details, so that further investigations by SKF can be persued.

7.35 SCR informed some cases of MSU lateral play more, which needs to be investigated further by RDSO in association with wheel shop and bearing manufacturers. Proper procedure for measurement of MSU lateral play also needs to be specified by RDSO.

7.36 SCR also informed that MSU oil debris analysis is useful. This should be followed by all the sheds as per SMI-324 dated 24.8.2018.

7.37 SCR informed that step size racer for axle box is developed by M/s NEI.

7.38 SCR informed that DE side inner racer cracks are observed when armature shaft bearing seating area diameter is more than 180.068mm.

7.39 SCR informed that ELS/LGD is using silicone sealant Anabond-685 having fast curing properties for gear case assembly, axle box and Sneider VCB insulator joint sealing to arrest oil leakage/moisture entry.

7.40 SCR also informed that torque multiplier is used for reducing the effort required by staff while tightening with prescribed torque.

7.41 Case of one MSU failure due to Allen screw sheared of within one year in 30545/RPM needs to be further investigated by CLW.

7.42 In SRC, in two MSUs, grease was observed in MSU tube housing, which reflects excessive clearance in labyrinths. During re-greasing or during service, grease is escaping from bearings into MSU tubes. Other, Railways shall also record such observations and send the data to CLW and in turn CLW shall investigate into the matter.

8 Decisions taken during the meeting

8.1 ***Greasing schedule to be reviewed by RDSO.***

8.2 ***All the sheds have been advised to follow the practice of full greasing till grease comes out from outlet and feedback to be provided to RDSO. Till the necessary instructions are revised by the RDSO, sheds to ensure above practice. Sample check of metal content in grease should be carried out by shed.***

8.3 ***Fifteen days drive needs to be launched for providing full greasing till grease comes out from outlet in TMs, where full greasing had not been carried out earlier.***

8.4 ***CLW and other TM manufacturers (like M/s BHEL, M/s CGL, M/s BBL, M/s Saini, M/s Medha, M/s CRRC) are advised to ensure full greasing till grease comes out from outlet during TM manufacturing and assembly.***

8.5 All sheds are had been requested to share the practice of greasing followed within 15 days with RDSO so that necessary instructions can be revised by RDSO.

8.6 All the sheds had been requested to share with RDSO the limit of metal content followed, effectiveness of metal content checking, and whether there is any need to review the specified limits.

8.7 It is decided that Joint audit of CLW will be carried out by RDSO with Zonal Railways for TM and MSU manufacturing/assembling.

8.8 DLW/DMW also advised to carry out system audits on their own.

8.9 It was informed that all the sheds are not having ring gauge and plug gauge and there is difficulty in procuring it from industry. DMW had agreed to manufacture the gauges. It is decided that DMW will manufacture one set of gauges initially and validate them at one loco shed. Then, other sheds can procure the gauges from DMW. RDSO will issue the required drawings of ring gauge and plug gauge.

8.10 All the traction motor manufacturers to give cut-in date for adoption of labyrinths as per original ABB dimensions as advised vide Modification Sheet no. 478 dated 30.7.2019.

8.11 ELS/KYN had started monitoring of temperatures of bearings as pilot project. ELS/KYN to share the details with RDSO and other Zonal Railways. Other Zonal Railways may also try the similar systems for monitoring the temperature of bearings.

8.12 EAC of the grease may be examined and increased if required, by CLW & other Zonal Railways. All the sheds are requested to send details of EAC and pending purchase orders of SHC-120 within 15 days to RDSO, so that consolidated requirement may be advised to IOCL.

8.13 CLW to ensure 100% measurement of assembly components on CMM by the firms. 20% Sample checking on random basis must be carried out by CLW. QAP of the firms may also be reviewed by the CLW.

8.14 In order to avoid of delay in approval of QAPs affecting quality of materials, all QAPs of critical items shall be approved by RDSO.

8.15 Prototype units of materials were reported to have quality issues. In some of the prototype inspections RDSO is also involved jointly with CLW, but prototype clearance is given by CLW. Where RDSO jointly carry out prototype tests, RDSO shall issue Prototype Clearance.

8.16 CLW to ensure that rejected material like labyrinths etc. are returned to firm only after physically damaging/cutting the defective material to eliminate the chances of reuse.

8.17 For stator frames, run out, concentricity and parallelism are very important and needs to be ensured by CLW.

8.18 The procedure of run test of traction motor was deliberated and it is found that some sheds are doing the run test for fixed duration like 30 minutes and some other sheds are doing till temperature stablisation. Conducting run test till temperature stablisation is correct method and should be followed.

8.19 Technical audit of wheel pressing activity of CLW and DLW to be carried out by RDSO jointly with supervisors of wheel shop of ELS/Tata.

8.20 Random inspection of items already inspected by other agencies needs to be carried out for safety critical items to ensure quality during fitment by shops.

8.21 Further, a committee of officers from CLW, RDSO and one or two zonal railways, most affected one, shall be formed to carry out audits of approved vendors of mechanical components of TMs and MSU complete for compliance of STR and approved QAPs.

8.22 To avoid the chances of fluting failure of bearing, all the sheds should do proper prescribed maintenance of earth return brush.

8.23 All the wheel shops (Tata, KPA, BSL, CNB etc.) are advised to measure and record the C, D, E & F clearances of MSU at the of manufacturing/assembly and again measure before dismantling the MSU at the time of next overhaul/Re-disking etc. to ascertain whether any deviation is there or not. They are further advised to replace all fasteners /rubber O-ring. In case there is a problem of grease ingress in MSU tube housing, all components of MSUs shall be replaced and on sample basis CMM measurement records of all such components shall be called from respective manufacturers for investigation purpose.

8.24 CLW is advised to expedite the fitment of Modified MSU supplied by M/s Timken and give a clear timeline. SER offered to undertake the project if CLW is unable to complete.

9 Other issues discussed during the meeting:

9.1 All Zonal Railways/Sheds to send regular data/feedback on failures. RDSO needs to compile all the failure data of important equipments and involve in service engineering and reliability improvements.

9.2 The data of vendor performance portal needs to be linked to vendor performance monitoring system and making of payment/imposition of penalty, warranty obligation etc.

9.3 At present there are separate failure monitoring portals of CLW/DLW/DMW/RDSO. There is need to develop a common portal, where all the arisings and punctuality cases can be entered by the sheds within predefined time frame of say 15 days. Provision should also be there for entering the failures of equipments procured separately like in RSP etc. also.

9.4 There should not be any difference between actual locomotive outage and outage on FOIS.

9.5 All passenger locomotives to be turned out from CLW/DLW/DMW equipped with HOG.

9.6 Composite converter for WAP5 locomotive is under development.

9.7 Zonal Railways to ensure that only HOG loco is provided in HOG link and HOG is always working in HOG train. The Diesel issued to Power Cars of HOG trains needs to be monitored for ensuring working of HOG.

9.8 All WAP5 locomotives from 2020-21 will be turned out with HOG. There is a RSP sanction of 375 HOG converters for conversion of remaining WAP7 locomotives.

9.9 Sheds to focus more on reducing failures instead of repairing the unhealthy unit exchange spares.

9.10 RDSO may develop a uniform format for joint note for converters with diagnostic data set.

9.11 Axle Journal bulging is observed in DLW locomotives. It is learnt that DLW is not doing finishing of axle after wheel pressing. Axle burnishing and Journal grinding machine is not available with DLW.

9.12 SER requested to review the replacement periodicity of spheriblocks.

9.13 ELS/AQ informed the increasing trends of failures of Frontier make Helical Springs. All the sheds are requested to provide details of spring failures to RDSO for further analysis.

9.14 SER informed that DPWCS is regularly used without guard.

9.15 It was informed that Eastern Railway had given developmental order to M/s Balmer for grease equivalent to SHC-120. Normally developmental orders should not be given for critical safety items without clearance from vendor approving authority like CLW/RDSO and prototype clearance. Necessary compatibility tests, intermixing tests, field trials etc. are required before the use of proposed substitute of SHC-120 grease.

10 At the end of the meeting, EDEE RS advised all the sheds to act on a mission mode to eliminate the problem of axle lock and advised to focus on arisings, as every failure is important for shed. Sr. DEEs of sheds were advised to critically examine the implementation of RDSO SMIs in their shed along with its relevance. He had advised Zonal Railways for timely preparation of One Page Reports (OPR) for all punctuality cases and that arisings should be analysed by the shed/Zonal Railway and periodical consolidated reports needs to be send to RDSO. RDSO is advised to develop a unified portal for reporting of failure and vendor performance. He had also advised sheds to ensure that with outsourcing/AMC of various items, shed expertise should not be lost. EDEE RS also gave thanks to SER team for conducting well organized meeting and making other arrangements.

24.1.2020

(P.K. Saraswat)
for Director General/ Electrical

List of Participants:

SNO	Name (Shri)	Designation	Railways
1.	Kishore Kumar	ED /RS	RB
2.	Kishore Vaibhav	DEE /RS	RB
3.	Ganesh	CELE/ER	ER
4.	Surendra Yadav	CELE/WCR	WCR
5.	K. Thourya	CELE/SCR	ECR
6.	Kalyan Pattnaik	CELE/ECoR	ECoR
7.	A.P. Labhane	CELE/SECR	SECR
8.	J.R. Meena	CELE/ECR	ECR
9.	A.M. Chowdhary	CELE/SR	SR
10.	R.K. Tewari	CELE/SER	SER
11.	P.K. Saraswat	Dir/Elect./RDSO	RDSO
12.	S.P. Patra	Dy.CEE/TMM	CLW
13.	Ashok Kumar	Dy.CDE/M	DLW
14.	A.K.P Rosty	Dy.CEE/OP	NR
15.	M. Kulani	Dy.CEE/Loco	SER
16.	B.P. Singh	Dy.CME/BS	DMW
17.	G. Kumar	Sr. DEE/TRS/GMO	ECR
18.	Jeetram	Sr.DEE/TRS/SPE	SER
19.	Vinod Kumar	Sr.DEE/TRS/BKSC	SER
20.	Shashi Kant	Sr DEE/TRS/TATA	SER
21.	D.V. Yadav	Sr.DEE/TRS/HWH	ER
22.	Rajesh	Sr.DEE/TRS/SER	SER
23.	Amit Gupta	Sr.DEE/TRS/AQ	CR
24.	Pradeep Sharma	Sr.DEE/RS/CNB	NCR
25.	Siva Naresh	Sr.DEE/TN/VAT	ECoR
26.	K. Kiran Kumar	Sr.DEE/ELS/KZJ	SCR
27.	Arvind Kumar	SrDEE/ELS/BNDM	SER
28.	Shashank Koshta	DEE/TRS/BIA	SECR
29.	Gaurav K Srivastava	DEE/TRS/TKD	WCR
30.	K.K. Rastogi	DEE/TRS/GZB	NR
31.	Susthant Kumar	DEE/TRS/NKJ	WCR
32.	Bachu Ramesh	DEE/RS/IC/RPM	SR
33.	Praveen	DEE/SER	SER
34.	Mukesh Karidhal	WM /Loco (Bogie)	DLW
35.	Bablu Samanta	SSE/GMO	ECR
36.	Shantosh Kumar	SSE/GMO	ECR

37.	K.L. kacnhoria	SSE/ELS/GZB	NR
38.	R.K.Sharma	SSE/ELS/LDH	NR
39.	Dinesh Sharma	SSE/ELS/HWH	ER
40.	Sudip Datta	SSE/ELS/HWH	ER
41.	Dharmendra Kumar	SSE/BKSC	SER
42.	Joyanto kotal	SSE/CLW	CLW
43.	S.Jeyanth	SSE/ELS/RPM	SR
44.	M.R.Ghooi	SSE/AQ	CR
45.	Shaik Nadar	SSE/ELS/KZJ	SCR
46.	G.Ajay Brahmechari	SSE/ELS/LGD	SCR
47.	M.Prashanth	SSE/ELS/KZJ	SCR
48.	B.M.Behera	SSE/TRS/Roy	SR
49.	Dilip Kumar Gorai	SSE/CLW.CRJ	CLW
50.	Gurudas Mandal	SSE/DRG/CLW	CLW
51.	A.Sinha	SSE/DLW	DLW
52.	Ravi Yadav	SSE/TM/CLW	CLW
53.	Rahul Agarwal	SSE/Design/CLW	CLW
54.	Uday Bhan Yadav	SSE/D/RDSO	RDSO
55.	L.C.Mahawar	SSE/Elect/RDSO	RDSO
56.	Susthant Kumar	DEE/TRS/NKJ	WCR
57.	P.K.Gupta	DEE/TRS/BRC	WR
58.	Satish Pendse	SSE/ELS/BRCY	WR
59.	Niraj Tiwari	SSE/ELS/BRCY	WR
60.	Bimal Adhikary	SSE/ELS/SRC	SER
61.	Malay Kumar Ghoshal	SSE/ELS/SRC	SER
62.	K.V.B.kumar	SSE/ELS/VSKP	ECoR
63.	G.Sarvarayudu	SSE/ELS/VSKP	ECoR
64.	N.K.Saxena	SSE/ELS/KYN	CR
65.	S.P.Verma	SSE/TKD	WCR
66.	Arif Mohd.	SSE/ TKD	WCR
67.	Rajeev Nayan	SSE	SER
68.	Suresh Kr. Bhuyan	SSE	SECR
69.	Anil Das	SSE/TATA	SER
70.	S.K.Mandal	SSE/ TATA	SECR
71.	Varun Kumar	SSE/TRS	SECR
72.	Mahendra Pratap	SSE/CNB	NCR
73.	S.C. Arya	SSE/CNB	NCR
74.	Shilshir Kumar	JE/NKJ.	WCR
75.	Ujjwal Mondal	JE/DLW	DLW

Annexure-II

Details of Axle Lock Cases

SN	Loco No	Rly	Shed	Loco type	CLW /DLW /DMW	DOC loco	DOF	Axle Position	Equipment	Make	DE / NDE
1.	32052	CR	AQ	WAG-9	CLW	30-Mar-18	07-Jan-19	6	TM bearing	NK	DE
2.	30465	CR	AQ	WAP-7	CLW	30-Apr-16	30-Jan-19	1	MSU Bearing	NK	NK
3.	30263	CR	AQ	WAP-7	CLW	03-Jun-11	11-Feb-19	6	MSU Bearing	SKF	NK
4.	32296	CR	AQ	WAG-9	CLW	01-Feb-19	17-Feb-19	4	TM bearing	FAG	DE
5.	31558	CR	AQ	WAG-9	CLW	22-Jan-15	16-Apr-19	6	TM bearing	SKF	DE
6.	31750	CR	AQ	WAG-9	CLW	18-Apr-16	06-May-19	5	TM bearing	FAG	DE
7.	31272	CR	AQ	WAG-9	CLW	30-Nov-10	22-Aug-19	2	TM bearing	SKF	DE
8.	31246	CR	AQ	WAG-9	CLW	13-May-10	22-Sep-19	6	MSU Bearing	FAG	DE
9.	31649	CR	AQ	WAG-9	CLW	18-Jan-16	17-Dec-19	6	TM bearing	FAG	NDE
10.	32270	CR	BSL	WAG-9	CLW	31-Dec-18	10-May-19	5	TM bearing	FAG	DE
11.	34009	CR	KYN	WAG-9	CLW	20-Apr-19	27-May-19	1	TM bearing	SKF	DE
12.	34012	CR	KYN	WAG-9	CLW	08-Feb-19	19-Jul-19	5	TM bearing	FAG	DE
13.	34010	CR	KYN	WAG-9	CLW	08-Apr-19	21-Jul-19	5	TM bearing	FAG	DE
14.	31431	CR	KYN	WAG-9	CLW	31-Oct-13	18-Sep-19	5	TM bearing	FAG	DE
15.	31864	ECoR	WAT	WAG-9	CLW	30-Mar-17	07-Nov-19	3	MSU Bearing	FAG	DE
16.	30706	ECoR	WAT	WAP-7	CLW	20-Aug-18	01-Jan-20	1	TM bearing	FAG	DE
17.	32334	ECR	BJU	WAG-9	CLW	03-Jun-19	25-Jun-19	6	TM bearing	NK	DE
18.	32340	ECR	BJU	WAG-9	CLW	29-May-19	25-Jun-19	3	TM bearing	NK	DE
19.	32215	ECR	BJU	WAG-9	CLW	28-Sep-18	27-Jul-19	5	TM bearing	NK	DE
20.	32215	ECR	BJU	WAG-9	CLW	28-Sep-18	06-Aug-19	5	TM bearing	NK	DE
21.	37133	ECR	GMO	WAP-7	DLW	17-May-19	07-Jan-20	2	Axle box bearing	NK	NK
22.	41001	ECR	GMO	WAG-9	DLW	13-Feb-19	05-Jan-20	3	TM bearing	NK	DE
23.	31306	ECR	GMO	WAG-9	CLW	12-Dec-17	28-May-19	1	TM bearing	SKF	DE
24.	31338	ECR	GMO	WAG-9	CLW	01-Jan-13	18-Nov-19	1	TM bearing	FAG	DE
25.	30455	ER	HWH	WAP-7	CLW	30-Apr-16	12-Aug-19	3	TM bearing	SKF	NDE

S N	Loco No	Rly	Shed	Loco type	CLW /DLW /DMW	DOC loco	DOF	Axle Position	Equipment	Make	DE / NDE
26.	32093	NCR	CNB	WAG-9	CLW	24-Apr-18	17-May-19	2	TM bearing	FAG	DE
27.	32255	NCR	CNB	WAG-9	CLW	22-Nov-18	17-Jun-19	3	TM bearing	SKF	NDE
28.	32188	NCR	CNB	WAG-9	CLW	12-Sep-18	9-Sep-19	1	TM bearing	SKF	DE
29.	32292	NCR	CNB	WAG-9	CLW	8-Feb-19	23-Sep-19	5	TM bearing	SKF	DE
30.	32535	NCR	CNB	WAG-9	CLW	31-Aug-19	7-Sep-19	6	TM bearing	SKF	DE
31.	32338	NCR	CNB	WAG-9	CLW	8-Apr-19	26-Oct-19	5	TM bearing	SKF	DE
32.	32162	NCR	CNB	WAG-9	CLW	6-Sep-18	7-Nov-19	5	TM bearing	SKF	DE
33.	32550	NCR	CNB	WAG-9	CLW	15-Nov-19	7-Dec-19	2	TM bearing	SKF	DE
34.	32158	NCR	CNB	WAG-9	CLW	10-Sep-18	8-Dec-19	1	TM bearing	SKF	DE
35.	37199	NCR	CNB	WAP-7	DLW	31-Jul-19	9-Dec-19	2	TM bearing	SKF	DE
36.	32162	NCR	CNB	WAG-9	CLW	6-Sep-19	12-Dec-19	2	TM bearing	SKF	DE
37.	30232	NR	GZB	WAP-7	CLW	19-Apr-19	05-Jul-19	5	TM bearing	NK	DE
38.	39023	NR	GZB	WAP-7	DMW	12-Feb-19	25-Aug-19	3	TM bearing	NK	NDE
39.	30293	NR	GZB	WAP-7	CLW	28-Jan-15	20-Nov-19	5	TM bearing	FAG	DE
40.	30101	NR	GZB	WAP5	CLW	30-Dec-18	12-May-19	2	G/C Bearing	Timken	GCB
41.	30151	NR	GZB	WAP5	CLW	26-Sep-18	25-Oct-19	2	G/C Bearing	Timken	GCB
42.	30182	NR	GZB	WAP5	CLW	02-Nov-19	12-Dec-19	3	G/C Bearing	NK	GCB
43.	32540	NR	LDH	WAG-9	CLW	2-Sep-19	7-Sep-19	5	TM bearing	SKF	DE
44.	32122	NR	LDH	WAG-9	CLW	4-Oct-18	19-Nov-19	5	TM bearing	SKF	DE
45.	32327	NR	LDH	WAG-9	CLW	21-Feb-19	21-Nov-19	4	TM bearing	SKF	DE
46.	32329	NR	LDH	WAG-9	CLW	21-Feb-19	17-Nov-19	4	TM bearing	SKF	DE
47.	32397	NR	LDH	WAG-9	CLW	11-May-19	28-Nov-19	1	TM bearing	FAG	DE
48.	32499	NR	LDH	WAG-9	CLW	01-Aug-19	12-Dec-19	4	TM bearing	FAG	DE
49.	32635	NR	LDH	WAG-9	CLW	20-Dec-19	21-Dec-19	6	TM bearing	SKF	DE
50.	32436	NR	LDH	WAG-9	CLW	03-Jul-19	24-Dec-19	6	TM bearing	NK	DE
51.	32538	NR	LDH	WAG-9	CLW	02-Sep-19	31-Dec-19	5	TM bearing	NK	NDE
52.	32164	NR	LDH	WAG-9	CLW	03-Oct-18	18-Dec-19	6	MSU Bearing	NK	DE
53.	32330	SCR	LGD	WAG-9	CLW	08-Apr-19	08-Apr-19	6	TM bearing	SKF	DE

SN	Loco No	Rly	Shed	Loco type	CLW /DLW /DMW	DOC loco	DOF	Axle Position	Equipment	Make	DE / NDE
54.	32408	SCR	LGD	WAG-9	CLW	31-Mar-19	03-Apr-19	1	TM bearing	SKF	DE
55.	32330	SCR	LGD	WAG-9	CLW	08-Apr-19	24-Apr-19	1	TM bearing	SKF	DE
56.	32326	SCR	LGD	WAG-9	CLW	01-Feb-19	11-Jun-19	6	TM bearing	SKF	DE
57.	32325	SCR	LGD	WAG-9	CLW	22-Feb-19	27-Jun-19	4	TM bearing	SKF	DE
58.	32408	SCR	LGD	WAG-9	CLW	23-Mar-19	24-Aug-19	5	TM bearing	SKF	DE
59.	32520	SCR	LGD	WAG-9	CLW	28-Oct-19	28-Oct-19	6	TM bearing	SKF	DE
60.	31600	SCR	LGD	WAG-9	CLW	28-May-15	03-Oct-19	4	TM bearing	FAG	DE
61.	31559	SCR	LGD	WAG-9	CLW	22-Apr-15	01-May-19	6	TM bearing	FAG	DE
62.	30427	SCR	LGD	WAG-9	CLW	17-Feb-17	07-Nov-19	5	MSU Bearing	NK	DE
63.	30259	SCR	LGD	WAG-9	CLW	01-Mar-19	26-May-19	6	TM bearing	FAG	DE
64.	31916	SECR	BIA	WAG-9	CLW	05-Jul-17	04-Sep-19		TM bearing	SKF	DE
65.	31891	SECR	BIA	WAG-9	CLW	10-Mar-17	24-Dec-19		TM bearing	SKF	DE
66.	32203	SECR	BIA	WAG-9	CLW	03-Nov-18	23-Dec-19		TM bearing	NK	DE
67.	31707	SECR	BIA	WAG-9	CLW	05-Apr-16	04-Jan-20		TM bearing	NK	DE
68.	37095	SECR	BIA	WAP-7	DLW	06-May-19	18-Dec-19		TM bearing	NK	DE
69.	30545	SR	RPM	WAP-7	CLW	27-Jun-17	29-May-19	3	MSU Bearing	SKF	DE
70.	30350	SR	RPM	WAP-7	CLW	18-Apr-18	16-Apr-19	2	TM bearing	FAG	DE
71.	32506	WCR	NKJ	WAG-9	CLW	05-Sep-19	09-Dec-19	1	TM bearing	SKF	DE
72.	32468	WCR	NKJ	WAG-9	CLW	10-Sep-19	02-Jan-20	2	TM bearing	SKF	NK
73.	30219	WCR	TKD	WAP-7	CLW	01-Apr-04	08-May-19	6	MSU Bearing	NK	DE
74.	30682	WCR	TKD	WAP-7	CLW	10-Mar-18	29-Jul-19	6	MSU Bearing	NK	DE
75.	31610	WCR	TKD	WAG-9	CLW	02-Aug-15	12-Nov-19	5	TM bearing	FAG	DE
76.	30081	WR	BRC	WAP5	CLW	30-May-15	08-Jul-19	3&4	Gear Case Bearing	TIMKEN	GCB
77.	30084	WR	BRC	WAP5	CLW	22-Jun-16	09-Aug-19	3	Gear Case Bearing	NK	GCB