



सत्यमेव जयते

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No. EL/11.5.5/ 21

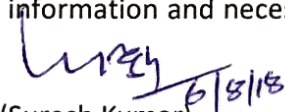
Date: 06.08.2018

1. M/s ABB Limited, Survey No. 88/3-4, Nelamangala Taluk, Bangalore – 562 123
2. M/s. BHEL Limited, Electronics Division, PB.No.2606, Mysore Road, Bangalore-560 026
3. M/s BTIPL, ERDA Raod, Maneja, Vadodara-390 013
4. M/s. CGL, Plot No. 9, MPAKVN Phase-2, New Industrial Area, Mandideep – 462 046
5. M/s Medha Servo Drives Pvt. Ltd., P-4/5 B, I.D.A., Nacharam, Hyderabad – 500076

Sub: Minutes of the Meeting on issue of coolant being used in traction converter of three phase electric locomotives.

A meeting on issue of coolant being used in traction converter of three phase electric locomotives was held at RDSO/ Lucknow on 3rd Aug-2018 in presence of RDSO, DLW, CLW, Railways and firm's representatives.

Minutes of meeting (MoM) of the same is enclosed herewith for kind information and necessary action please.

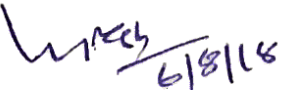

(Suresh Kumar)

Encl: As above.

For Director General (Elect.)

Copy to:

1. **Secretary (Electrical), Railway Board, Rail Bhawan, New Delhi-110 001.**
(Kind attn: Shri A.K. Goswami, DEE/RS/RB): For kind information.
2. **General Manager (Design), Diesel Locomotive Works, Varanshi-221004.**
(Kind attention: Shri Sujeet Mishra, CDE/Electrical): For kind information.
3. **Principal Chief Electrical Engineer, (For information and necessary action please)**
 - Central Railway, HQs Office, 2nd floor, Parcel Office Bldg., Mumbai-400 001
 - East Central Railway, Hajipur (Bihar)-844 101
 - Eastern Railway, Fairlie Place, Kolkata – 700 001
 - East Coast Railway, Railway Complex, Bhuvneshwar – 751 023
 - Northern Railway, Baroda House, New Delhi-110 001
 - North Central Railway, Allahabad – 211 001
 - South East Central Railway, Bilaspur-495 004
 - South Central Railway, HQs Office, Rail Nilayam, Secunderabad-500 071
 - South Eastern Railway, Garden Reach, Kolkata- 700 043
 - Southern Railway, Park Town, Chennai – 600 003
 - West Central Railway, HQs Office, Opp. Indira Market, Jabalpur-482 001
 - Western Railway, Churchgate, Mumbai – 4000 020
 - Chittaranjan Locomotive Works, Chittaranjan – 713 331(WB)


(Suresh Kumar)

Encl: As above.

For Director General (Elect.)

Minutes of Meeting held at RDSO/LKO on 03.08.2018 regarding issues of coolant to be used in Traction Converter of 3-phase locomotives

Members Present:

RDSO	1.	Shri O.P. Kesari, PEDSE
	2.	" Suresh Kumar, DSE/TPL
	3.	" S.K. Deo, SSE/TPL
	4.	" Ran Vijay, JE/TPL
DLW	5.	" Sujeet Mishra, CDE
CLW	6.	" Pankaj Kumar, ADE/D&D
Railways	7.	" Anant Sadasiva, Sr. DEE/TRS/TATA
	8.	" R.S. Chaturvedi, Sr. DEE/TRS/CNB
	9.	" A.K. Rana, AEE/TRS/HWH
M/s BHEL	10.	" Shekar R., AGM/TE.
	11.	" Dr. L.N. Satapathy, AGM/ESD
M/s ABB	12.	" S. Saikiran, Product support
	13.	" Ramu. S, Engineering
M/s BTIPL	14.	" Arvind Kumar Pandey, Head North
	15.	" Pruthviraj Daga, Lead Mech-Design
M/s CGL	16.	" Sanjay Ostwal, DGM/CGP
	17.	" Dr. G.S. Prabhu, Director
	18.	" Rammurthy Sandri, AGM/CGP
M/s Medha	19.	" S. Devender, Sr. Engineer
	20.	" K. Lokesh, Engg. Marketing
M/s Clariant	21.	" Abhang Kate, Technical Sales
M/s Chemtex	22.	" Snehasish Bhattacharya, Asst. Manager
	23.	" Shubham Karmani, Director-Tech

- 1.0 The meeting was convened to address the quality issues arising in IGBT based traction converters as decided in last meeting held at ELS/BIA on 19/20.07.2018.
- 2.0 PEDSE welcomed all the participants in the meeting. PEDSE expressed his concern on the poor quality of coolant being used by traction converter manufacturer especially by M/s ABB, BHEL, CGL and Medha. Converter manufacturer should test the coolant and should ensure quality of the coolant for the use.
- 3.0 A number of cases have been reported by Railways across different makes of traction converters which used the coolant supplied by M/s Chemtex. The problem is attributed to incompatible coolant which chemically reacts with the radiators inner walls leads to following problems:
 - (i) Radiator failures,
 - (ii) Coolant overflowing,
 - (iii) Blockade in cooling circuit,
 - (iv) Discoloration of coolant,
 - (v) Bad smell from coolant,
 - (vi) Gas formation,
 - (vii) Stutchi coupler failure,





- 4.0 BHEL has indicated that they initially used coolant with polypropylene glycol 30% and demineralised water (70%). Subsequently, while standardising the coolant CLW has finalised ethylene glycol (30%) and demineralised water (70%) based coolant. All the firms, except BTPIL started procuring the coolant from M/s Chemtex which created above mentioned problems mentioned in para-3.0 above. M/s BTPIL kept on procuring the coolant from M/s Clariant. Meanwhile vide CLW letter no. C-D&D/T/24 dated 06.07.2018 converter manufacturers have been asked to use only Clariant make coolant (Type Antifrogen-N water mixture 30%) which is a Hybrid Organic Acid Technology (HOAT).
- 5.0 Deliberations and decision done during the meeting are detailed below:
- 5.1 **Procedure for flushing of hydraulic loop by ELS (Converter & heat exchanger) for replacement of coolant:** The proposed sequence for flushing of hydraulic loop has been decided as below. Concern ELS shall extend support for the below activities along with firm's representatives:
- (i) Converter shall be cleaned at the locomotive fitment position itself with cleaning agent containing organic acid with suitable inhibitor like Alstaclean RCX Plus or equivalent. Cleaning agent shall be prepared by mixing 1 part cleaning agent with 10 to 15 part DM water,
 - (ii) Heat exchanger shall be dismantled from locomotive and cleaned thoroughly in the collecting tray for proper flushing with cleaning agent specified in (i) above,
 - (iii) After this, proper neutralisation and passivation with Protodin HBL or equivalent at the rate of 500 ml in 100 litre DM water shall be done.
 - (iv) Secondary flushing shall be done using Antifrogen-N/HOAT coolant in small quantity.
 - (v) After thorough flushing & cleaning, fresh Antifrogen-N/HOAT coolant shall be filled in the entire hydraulic loop within 12 hrs. to avoid oxidation.
- 5.2 **Procedure for filling up the coolant in new loco at CLW:**
- (i) The new loco radiator during commissioning has to be flushed because the new system may contain some metal working fluids, soldering deposits, dirt and oil which later on may affect the system efficiency and life of coolant/equipment. Contaminants in a cooling system may cause abrasion, scaling and foaming in the system.
 - (ii) The system should be flushed with a 4% solution of Neutral pH Emulsifying Cleaner and DM water followed with flushing with Antifrogen-N/HOAT Coolant prior to charging of final Coolant.
- 5.3 **Testing of coolant:** Following course of actions have been decided regarding testing of Fresh Coolant and coolant filled in Traction Converter:
- (i) **Fresh Coolant:** Fresh coolant shall be tested by converter manufacturers as per appropriate test standards. Only after getting satisfactory test results, coolant shall be used in Traction Converter or shall be given to Loco Sheds. CLW and Converter manufacturer shall ensure quality check of coolant by testing the same once in a year.
 - (ii) **Coolant already filled in Traction Converter:** The quality of coolant already filled in Traction Converter shall be ensured by concern Electric Loco Shed itself by checking

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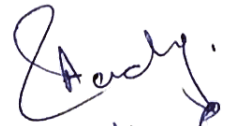
Ethylene-Glycol %age, Reserve alkalinity, pH value and Specific gravity. This check shall be carried out in every TOH.


- 5.4 Manufacturing units and Electric Loco Sheds shall avoid mixing of different make coolants and topping up with any type of water during maintenance activities.
- 5.5 RDSO shall prepare a Special Maintenance Instruction (SMI) for adopting type of coolant, its testing and maintenance procedure.



Shekar
BHEL-CON



(RAM V. S.)
ABB LTD.

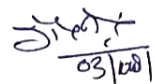

Oshwal S.S.
CGPISL.



Arvind Kumar
BTIPL/Delhi

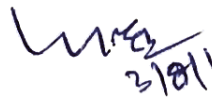

Shubham Kumar
(Chemical Sp. Unit)


03/08/18
ABB/D412/CLW


03/08/18
AGE/TRS/ELS/HW


03/08/18
SSE/TPL/RDSO


(K. Lokesh)
m/s medha


03/08/18
DSE/TPL