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

No. EL/11.5.5/5

Date: 14.07.2017

M/s. Crompton Greaves Limited,
Drives & Automation Division: Industrial Systems
Mandideep, Bhopal
Madhya Pradesh-400042

Sub: Minutes of the Meeting held at RDSO, Lucknow on 04-07-2017 on Reliability improvement of IGBT based Power converter and Auxiliary converter of three phase electric locomotives.

Ref: (i) MoM dtd. 19.04.17 issued vide this office letter of even no. dtd. 03.05.17.
(ii) MoM dtd. 12.05.17 issued vide this office letter of even no. dtd. 25.05.17.

A meeting to discuss and review the progress of action plan as decided in the meeting under reference for reliability improvement of IGBT based Power converter and Auxiliary converter of M/s CGL was held at RDSO, Lucknow on 04-07-2017.

Please find enclosed herewith a copy of Minutes of the Meeting of the same for information and necessary action.

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14/07/17

(Suresh Kumar)

For Director General (Elect.)

Encl: As above.

Copy to:

1. **Secretary (Electrical), Railway Board, Rail Bhawan, New Delhi-110 001.** For kind information. (Kind Attn.: Shri A.K. Goswami - DEE/RS)
2. **Chief Electrical Engineer, (For information and necessary action)**
 - 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)
3. **Sr. Divisional Electrical Engineer (TRS), Electric Loco Shed,**
 - South Eastern Railway, Tatanagar – 831 002
 - East Central Railway, Gomoh-828 401
 - South Eastern Railway, Bondamunda,

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14/7/17

(Suresh Kumar)

For Director General (Elect.)

Encl: As above.

Minutes of the Meeting held on 04.07.17 at RDSO, Lucknow.

Members Present: S/Shri

RDSO 1. O.P. Kesari, EDSE (Co-ord) 2. Suresh Kumar, DSE/TPL 3. M.N.Lodhi,SSE/TPL	CGL 1. S.S. Ostwal, DGM/CGL 2. Arvind Pandey-Mgr/CGL 3. Amit Bajaj- AM/CAF-P&A 4. Alfonso Albo-CAF-P&A
ELS/TATA 1 Anant Sadashiva, Sr.DEE 2 Ajit Bhandekar-SSE	
ELS/GMO 1 Navin Prakash-ADEE 2 S N Jha-SSE	
ELS/BNDM Dinesh Verma-DEE	

A meeting was held on 04-07-2017 at RDSO, Lucknow to discuss reliability issues of M/s CGL make IGBT based Traction Converter and Auxiliary converters in 3-phase electric locos. The progress of various decisions taken during the meeting and proposed action plan by firms to improve reliability of their equipments is as below:

1 M/s CGL make Traction Converter:

I. BUR current increase (> limit of 400 Amp)

This problem is observed during low OHE voltage with consequent increase in input current of auxiliary converter which leads to main power OFF. For solving this, firm has introduced time delay of 200 ms (presently instantaneous) to observe the triggering of protection action. This modification has been done by CGL in 26 locos and balance 1 locos in ELS/TATA will be modified by 31/7/17 on its arrival in shed for schedule maintenance.

II. Power module failure

- There are 6 cases of power module failure.
- In 4 cases, the temperature sensor (SCI/Spain make) found defective due to problem in welding process between sensor & cable. Firm has to replace sensors by Floricon make in 13 locos of traction converters. Out of these firms has completed 7 locos and balance 6 locos (all in ELS/GMO) will be completed by 31-08-2017.
- 2 cases of IGBT burst have been observed. Burst IGBT has been sent to OEM (Hitachi) for investigation. CGL had been insisted to submit investigation report at the earliest. However, report is still awaited.
- There are 4 new cases of IGBT burst have been reported from ELS/ TATA. The IGBT module got burnt. It may be due to loose contact between bus bar and clip clamp connector of power module. Firm shall submit the investigation report to RDSO by 17th July-2017.



III. PCB cards failure:

There are 2 cases of PCB cards failure. M/s CGL-informed that failed PCB cards were sent to their principals M/s CAF/Spain. This was investigated in detail and software bugs were detected. There was no other component failure. Modified software uploaded in all PCB cards. Performance is under watch.

IV. Other issues

Problem of coolant discolouring, slug formation reported from ELS/TATA. Firm shall submit the investigation report by 31/07/2017.

2 M/s CGL make Auxiliary Converter

I. Failure of PS card (KUC153A02):

In place of KUC153A02 card, firm modified KUB921 card of VCU and made it suitable for auxiliary converter. Modified KUB921 card has been provided in 153 locos. CGL will complete the modification of balance 93 Locomotives by Sep-2017 end.

II. Failure of BUR processor card (CCPU):

Switching over from one BUR to another is not taking place in case of failure. This was due to over sensitivity of input channel. Sensing voltage has been modified from 10 V to 36 V. Modified cards have been provided in 100 locos CGL will complete the modification in all balance 143 locomotives by Sep-2017 end.

III. Failure of INVCC card:

The failure is due to spurious inverter fault message in INVCC card. To resolve this problem the resistance to sense the over current has been increased in gate driver and corresponding software modification in INVCC card. Modified cards have been provided in 151 locos. CGL will complete the modification in all balance 96 locomotives by Sep-2017 end.

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14/7/17
DSE/TP/L/RDS