

Fax : (0522)-2452581
Telephone : (0522)-2465737
Telegram : 'RAILMANAK', Lucknow
Email : dsetplgroup@gmail.com



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

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Date: 27.05.2017

Chief Electrical Engineer,

- 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

TECHNICAL CIRCULAR No. RDSO/2017/EL/TC/0137, Rev. '0', Dated: 27.05.2017

Sub: Instructions for regular implementation of different SMIs/TCs/Technical Reports issued by RDSO from time to time to improve the reliability of Electronics of 3-phase electric locomotives.

1.0 Introduction

Presently, Indian Railways manufacture four classes of 3-phase drive locomotives viz. WAG9, WAG9H, WAP5 and WAP7, based on the transfer of technology (ToT) from ABB Switzerland. Under the ToT, Indian Railways received the technology to manufacture 3-phase locomotives with GTO based traction and auxiliary converter and MICAS based VCU. CLW has already switched over to manufacturing of 3-phase locomotive with IGBT based traction converter and auxiliary converter.

At present, CLW is manufacturing only IGBT based locomotives. Also, more than 700 locomotives are running with GTO based traction and auxiliary converters which should be maintained in proper way so that with the time their reliability is maintained to the best extent possible. This Technical Circular (TC) tells the various SMIs/TCs/Technical Reports issued on time to time by RDSO for reliability of 3-phase electric locomotives. The objective of this Technical Circular (TC) is mainly to spread awareness of the maintenance sheds towards different SMIs/TCs/Reliability reports issued by RDSO to improve the reliability of 3-phase electric loco.

L. K. Singh
27/5/17

2.0 The details of Important SMIs:

SN	SMI No.	Subject of SMI
1.	RDSO/2007/EL/SMI/0247(Rev.0)	Failure improvement of Valve Set in Power Converter for 3-phase electric locos
2.	RDSO/2007/EL/SMI/0248(Rev.0)	Maintenance of Earthing System in 3-phase electric locomotives type WAP5, WAP7 & WAG9.
3.	RDSO/2008/EL/SMI/0252(Rev.0)	Testing of Weigand speed sensor fitted with traction motor in WAG9, WAG9H, WAP7 & WAP5 locos.
4.	RDSO/2009/EL/SMI/0255(Rev.0)	Air delivery measurement in 3-phase locomotive to ascertain proper cooling and pressurization of machine room.
5.	RDSO/2009/EL/SMI/0256(Rev.0)	Testing of WRE gate unit card of Auxiliary converter of 3-phase electric loco to analyze the failure of gate unit card
6.	RDSO/2009/EL/SMI/0257(Rev.0)	Improvement in reliability of gate unit cards of power converter of 3-phase locos by measuring dBm level of QFBR-1478C transmitter (Component No. 151)
7.	RDSO/2009/EL/SMI/0258(Rev.0)	Improvement in reliability of LWL cards (AFB635A01) and bus coupler cards (UFB660A01&UFB701A01) of 3 phase locomotives by testing QFBR-1478C & 2478C transmitters & receivers.
8.	RDSO/2009/EL/SMI/0260(Rev.0)	Instructions for development of testing set up of signal conditioning cards (SAP) and Sensors for three phase electric locomotives
9.	RDSO/2009/EL/SMI/0261(Rev.0)	Repairing & testing of WRE modules of auxiliary converter for 3 phase electric locomotives
10.	RDSO/2010/EL/SMI/0263(Rev.0)	Instructions for development of testing setup of gate unit of traction converter for 3 phase electric locomotive.
11.	RDSO/2010/EL/SMI/0265(Rev.0)	Procedure for repairing of valve set of traction converter of 3-Phase electric loco
12.	RDSO/2016/EL/SMI/0286 (Rev.0)	Special Maintenance Instruction for maintenance of filters of Oil Cooling Blower (OCB), Machine Room Blower (MRB) and Traction Motor Blower (TMB) for 3- phase Electric Locomotives.
13.	RDSO/2016/EL/SMI/0287(Rev.0)	Special Maintenance Instruction for maintenance of Radiators of Oil Cooling Unit of 3- Phase Electric Locomotives.
14.	RDSO/2016/EL/SMI/0288(Rev.0)	Technical Scope of work for Annual Maintenance Contract (AMC) of Microprocessor based Control & fault diagnostic System (MPCS)
15.	RDSO/2016/EL/SMI/0294 (Rev.0)	Technical Scope of work for Annual Maintenance Contract (AMC) of GTO based Traction Converter (SR), Auxiliary converters (BUR) and MICAS based Vehicle control unit (VCU) of Three Phase Locomotives.
16.	RDSO/2016/EL/SMI/0297(Rev.0)	Operational, Maintenance and Troubleshooting of 2x500 kVA, IGBT based Hotel Load Converter of WAP7 locomotives.

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3.0 The details of Important TCs:

SN	TC No.	Subject of TC
1.	ELRS/TC/0091, REV. 0	Handling & cleaning of printing circuit board
2.	RDSO/2016/EL/TC/0133, Rev '0'	Instructions to form Multiple Unit of Three Phase Electric Locomotives.
3.	RDSO/2016/EL/TC/0134, Rev '0'	Instructions for formation of Interconnected Loco Bus Station Network
4.	RDSO/2016/EL/TC/0135, Rev '0'	Standardization of Electronics Lab of 3-Phase Electric Locomotives holding Sheds and Periodicity of Tests.

4.0 Technical Reports

SN	Technical Reports No.	Subject of Technical Reports
1.	RDSO/2016/EL/IR/0170, Aug'2016	Committee report for reliability of 3-phase locomotives over Indian Railways
2.	RDSO/2016/EL/IR/0176(Rev'0'), Oct'2016	Technical report on failure of valve sets of GTO based traction converters

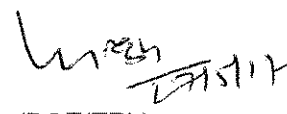
RDSO has issued a Report no.: RDSO/2016/EL/IR/0170 of August'2016. In chapter-9 of the report, the reliability action plan (RAP) for 3-phase locomotives have been indicated. The timelines for the completion of the same have also been drawn so that proper impetus can be given for their early completion. Similarly, the timelines for the existing RAP have also been drawn so that the Railways can complete the same early.

5.0 Agency for Implementation

All loco maintenance sheds holding 3-Phase Electric Locomotives.

6.0 Conclusion

From the above it is clear that the maintenance instructions issued on time to time as SMIs/TCs/Reliability report shall be very useful for the maintenance sheds for keeping better reliability of the different PCB cards, sensors, equipment, etc before there installation in the locomotives. Electric loco maintenance sheds need to consider the above mentioned SMIs/TCs/Technical reports to improve the reliability of 3-phase electric locomotives.


(DSE/TPL)