



सत्यमेव जयते

**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS**

**FUNCTIONAL REQUIREMENT SPECIFICATION (FRS)
FOR REPAIR of WRE/GG MODULE OF GTO BASED AUXILIARY
CONVERTERS of 3-PHASE ELECTRIC LOCOMOTIVES Type
WAP5, WAP7&WAG9**

SEPTEMBER' 2015

Approved by	अमितकाश 23.9.15
EDSE(Co-Ord)	Signature

Issued by

**Electrical Directorate
Research, Designs and Standards Organisation
Manak Nagar, Lucknow-226011**

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FUNCTIONAL REQUIREMENT SPECIFICATION (FRS) FOR REPAIR of WRE/GG MODULE OF GTO BASED AUXILIARY CONVERTERS OF 3-PHASE ELECTRIC LOCOMOTIVES TYPE WAP5, WAP7&WAG9

1.0: General:

Indian Railways imported 22 WAG9 locomotives and 11 WAP5 locomotives in 1997-98 from M/s. ABB, Switzerland. Later on, CLW started the manufacturing of these locomotives by procuring Power Converter, Auxiliary Converter & Control Electronics from ABB, Switzerland. This Functional Requirements Specification (FRS) is issued to serve as a essential guideline for repairing and testing of WRE/GG modules of auxiliary converter for 3-phase electric locomotives. The firm should satisfy themselves about having complied with the technical requirements and other infrastructure.

2.0. Background:

Railways have been reporting failures of WRE/GG modules of auxiliary converter. The components which generally fail in WRE module are GTOs, Diodes and Gate Driver cards.

3.0. scope:

This specification covers the repair of WRE/GG modules (Identification of defective components in WRE/GG module, replacement of defective components) and testing of WRE/GG modules of auxiliary converters fitted in WAP5/WAP7/WAP7 class of locomotives.

4.0. Compliance of RDSO's STR:




The potential bidder must give clause wise compliance of RDSO's STR for repairing of WRE/GG modules of auxiliary converters of three phase locomotives.

5.0. Technical:

For technical details regarding repair of WRE module e.g. WRE module configuration, repairing of WRE module etc. Please refer RDSO SMI no. RDSO/2009/EL/SMI/0261 (Rev-0)

6.0. Testing:

For details regarding testing to be carried out on repaired WRE/GG module e.g. Testing of WRE module, testing of GTO's, testing of freewheeling diode, testing of WRE gate unit card, no load testing,

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connection diagram etc. Please refer RDSO SMI no. RDSO/2009/EL/SMI/0261 (Rev-0)

7.0. Test protocol for repaired WRE/GG Module:


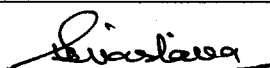
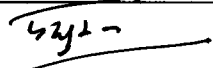
Firm shall submit the test protocol for testing the repaired WRE/GG module to RDSO for approval. The testing shall be carried out by inspection official as per approved test protocol.

8.0. QAP and Test Schedules :

Before offering prototype repaired unit for testing, final QAP and test schedules shall be submitted by the successful bidder to RDSO for approval.

9.0. Methodology of development:

- 9.1. Repaired WRE/GG modules shall be tested as per approved test protocol
- 9.2. After successful tests of repaired WRE/GG modules shall be cleared for trial in locomotive.
- 9.3. After successful field trial for 6 months of one loco sets quantity of repaired WRE/GG modules, firm shall be approved for repair of WRE/GG modules for auxiliary converters fitted in WAG9/WAP7/WAP5 locomotives
- 9.4. Test protocol for prototype tests, field trials, shall be jointly decided in consultation with RDSO

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