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No. EL/11.5.5/5

Dated. 25.05.2009

Chief Electrical Engineer,

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**SPECIAL MAINTENANCE INSTRUCTION No. RDSO/2009/EL/SMI/257
(Rev.'0'), Dated 22-5-09.**

1.0 TITLE

Improvement in reliability of gate unit cards of power converter of three phase locomotives by measuring dBm level of QFBR-1478C transmitter (component No. 151).

2.0 Background:-

The premature failures of SR gate unit (GVA 587 A01) is a major cause of concern as its contribution towards electronic component failure is maximum in three phase locomotives. The matter was taken up with BTIL and BHEL and it has come to notice that manufacture of wafer of this optical transmitter was shifted from USA to Singapore and final packing of this transmitter was shifted from Singapore to Philippines in year 2004. Earlier, after manufacturing, screening test of this component, comprising of burn-in cycle of 500 hrs. from -25 to +70 degree C used to be done in USA. This practice was stopped when manufacturing was shifted to Philippines. Later on, this practice was reintroduced in the end of year 2007; at Philippines. Hence the suspected lot is in service against supplies made between Jan 2005 to Sep 2007 batch of production, which is failing in the field due to "Backline Defect" where the output dB level of the component goes down prematurely with in a short span of time. It has also been observed that failure of optical transmitter of this batch is maximum causing premature failures of gate units.

M/s BTIL have also discussed the failures with M/s ABB/Switzerland and informed that similar premature failures of QFBR-1478C, have been encountered in Europe also. In Europe around 2% of total transmitters produced had failed on this account.

In order to prevent the same, the dBm level measurement has to be done in this suspect lot. Based on measured values of output of the transmitter (dBm), the transmitter may need replacement.

3.0 Objective:

To prevent failure of SR gate unit (GVA 587 A01) by measuring dBm level of optical transmitter (QFBR-1478C).

4.0 Instructions:

As stated in para 2.0 above, bad lot of transmitter (QFBR-1478C) is the reason of premature failure of this transmitter in gate unit (GVA 587 A01). The transmitters supplied from Jan 2005 to Sept 2007 reportedly have poor reliability. Thus it is decided to measure dBm level of optical transmitter (QFBR-1478C) of gate unit (GVA 587 A01). The suspected converter S.No. supplied by M/s BHEL, BTIL & NELCO during this period (April 2005 to Sept 2007) in which measurements are required to be made are enclosed as Annexure-II. All transmitters have a 4 digit code e.g. XX YY where XX indicates the year and YY indicates the week of production.

4.1 Method of measurement:

(i) The measurements should be taken in simulation mode of locomotive and taking traction. In this case power supply of 48 Volt is extended to Gate unit from GUSP. Optical cable connector at Gate unit at Rm location should be taken out and dBm level to be measured by dB meter. After measurements, optical cable connector need to be properly connected to the transmitter as improper connection would also lead to failure.

(ii) Alternatively, measurements of dBm level can also be taken in electronic lab if gate unit is taken out due to any other reason. Gate unit to be tested should be connected as per the general test setup shown at Annexure-I. Switch on 110V DC power supply which in turn enables the 48V AC supply for Gate unit under test and GUSET. Signal will be transmitted to Gate unit under test and in turn Gate unit under test will give a RM signal as feed back. This signal will be fed to optical power dB meter. Optical power dB meter will measure the signal power in dBm.

4.2 Method of screening:

S.No.	Measured dBm level	Action to be taken
1.	< -18 dBm	The transmitter is likely to fail and should be replaced.
2.	between -16 dBm and -18 dBm	Measurement should be repeated after six months and if dBm loss is more than -1dBm from its previous recorded value, transmitter should be replaced.
3.	>-16 dBm	Measurement should be repeated after one year and if dBm loss is more than -1dBm from its previous recorded value, transmitter should be replaced.

5.0 **Test Equipments Required:** Properly calibrated RIFOCS optical power db meter. GUSET, GUSP and 110 VDC power supply if measurement is to be done in electronic lab.

6.0 **Application to:**
WAP7, WAG9 and WAG9H locomotives.

7.0 **Agency of implementation:**
All sheds maintaining WAP7, WAG9 and WAG9H locomotives. M/s BT, BHEL & NELCO shall replace the transmitter free of cost based on dBm measurements.

Adh 25/05/09
(Sandeep Srivastava)
For Director General (Elect)

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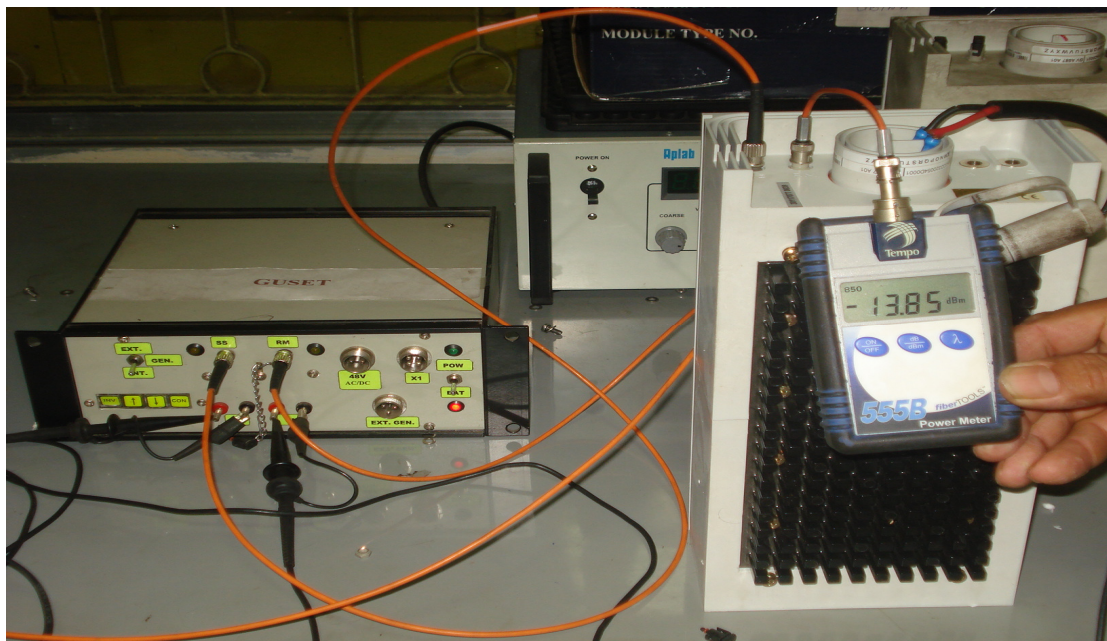
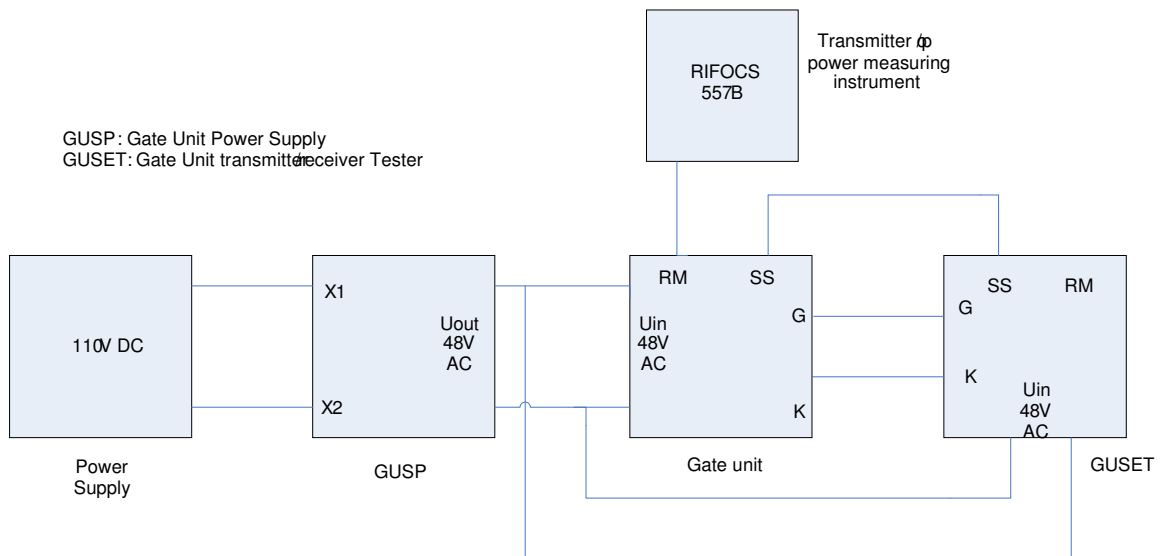
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Adh 25/05/09
(Sandeep Srivastava)
For Director General (Elec.)

Encl: As above.

Annexure-I

General test setup for testing QFBR-1478-C



Typical Test set up for testing SR gate unit

Annexure-II

Suspected Converter No. supplied by M/s BHEL

1. T 30071 to T 30172 (101 No.)

Suspected Converter No. supplied by M/s BTIL

1. BWNNEC5007-128 to BWNNEC5007-141 (14 No.)
2. BWNNEC6005-142 to BWNNEC6005-171, (30 No.)
3. BWNNEC7003-172 To BWNNEC7003-211 (40 No.)
4. BWNNEC8014-212 To BWNNEC8014-219 (08 No.)

Suspected Converter No. supplied by M/s NELCO

1. NELP048069001 to NELP048069006 (6 No.)
2. NELP04806B007 to NELP04806B010 (4 No.)
3. NELP04806C011 to NELP04806C012 (2 No.)
4. NELP048078001 to NELP048078005 (5 No.)
5. NELP048079005 to NELP048079010 (5 No.)
6. NELP04807A011 to NELP04807A012 (2 No.)
7. NELP04807B013 to NELP04807B016 (4 No.)
8. NELP04807C017 to NELP04807C020 (4 No.)
9. NELP048081021 to NELP048081022 (2 No.)
10. NELP048082023 to NELP048082034 (12 No.)