

**Reliability meeting of M/s ABB make IGBT based converters fitted in 3-ph loco held at RDSO
on 05.07.2018**

Member Present

RDSO	M/s ABB
1. Shri O.P. Kesari, PEDSE	1. Shri Pradip Savaliya
2. Shri Suresh Kumar, DSE/TPL	2. Shri Animesh Mathur
3. Shri S.K. Deo, SSE/TPS-2	
4. Shri Ran Vijay, JE/TPS-1	

In this meeting, issues related to M/s ABB make IGBT based Traction Converters and Auxiliary Converters have been discussed. The detailed deliberations done during the meeting are given below:

1.0 M/s ABB make Traction Converter

1.1 Failure trend of M/s ABB make traction converter:

SN	Cause of Failure	No. of Failures			
		2015-16	2016-17	2017-18	2018-19 (Apr-Jun) Reported by ABB
1	Duagon Card defective	10	4	4	0
2	Software Malfunctioning (Time out initialization, harmonic filter current high, etc)	44	43	46	15 (LC Overcurrent-8)
3	PEC (controller card) defective	11	11	12	4
4	Gate Driver Unit (GDU) cards	14	15	16	4
5	Pump Failure / Fan Failure	2	7	12	0
6	Loose connector/OFC/ Cable defective	6	4	3	3
7	PEBB (Power Module) Failure	12	20	24	10
8	Others (transient, contactor stuck up, MCB trip)	52	42	34	11 (Coolant overflow issues – 8)
	TOTAL	151	146	151	45
	Total Population	115	156	220	237
	FRPCPY	131	93.5	68.6	---

1.2 Following issues are with M/s ABB make traction converter:

SN	Item	Action plan	Remark
1.	Old software Issues: i. Harmonic Filter Over current. ii. Time out release shut down due to non-availability of timely signal from converter to VCU (within 150 ms) for DC link voltage	These software issues resolved in Verson-38 (417T38AB). Instructions have been issued for regular use of software version-38 vide RDSO letter No. EL/11.5.5/1/IGBT/ABB dtd. 19.06.17.	<ul style="list-style-type: none"> Only 6 locomotives are pending for downloading of Ver-38. SER (ELS/TATA) to ensure. RDSO has given provisional approval for downloading of Ver-39 in 5 locos each of ELS/GZB (WAP7), ELS/TKD (WAG9H) & ELS/BRC (WAP5).

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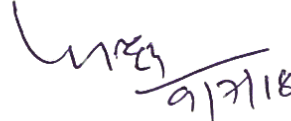
SN	Item	Action plan	Remark
	discharge. iii. Loco going into simulation mode with throttle not responding.		
2.	Software malfunctioning, TE becomes 0.	Firm has informed that the issue has been identified as when OHE has a dip the converter goes into backup braking leading to fluctuation in TE/BE meter. This is software issue and has been resolved in SW version-39 and under trial.	<ul style="list-style-type: none"> • Issue is addressed in software version 39. Performance is under watch. • Ver-39 will address – <ul style="list-style-type: none"> (i) Over current protection during low OHE voltage, (ii) Earth fault in main Txfr. (iii) TE suddenly goes to '0' • Software Version 39 is downloaded in 15 locomotives at <ul style="list-style-type: none"> ELS AQ- 31543 (WAG-9) ELS BRC- 30090, 30093, 30094, 30114, 30116 (WAP-5) ELS GZB- 30446 (WAP-7), 30104 (WAP-5) ELS TKD- 31357, 31719 (WAG-9), 30442, 30451 (WAP-7) ELS TATA- 31651, 31680, 31789 (WAG-9) <p>M/s ABB shall submit the detailed study and behavior of their traction converter at different panto bounce time.</p>
3.	New software Issues: Issue of 'Line Converter Overcurrent'	Out of 15 software malfunctioning cases, 8 cases of 'Line Converter Overcurrent' have been reported.	M/s ABB stated that they are studying the issues and will revert back by 15.07.2018.
4.	Failure of PEBB module	ABB has indicated that some issues for failure of IGBT modules have been identified and resolved in SW ver-39.	<p>10 cases (VSKP-3, AQ-2, TKD-3, RPM-1, BIA-1) of PEBB failures.</p> <p>6 Motor converter, and 4 Line converter modules, all Hitachi make.</p> <p>In spite of taking reliability actions by M/s ABB, no improvement has been noticed in PEBB module failure. M/s ABB shall submit the new action plan along with investigation report of the PEBB module failure by July'18 end.</p> <p>Performance is under watch.</p>
5.	Timing issue in PEC Card	PEC-2 card software modified to reduce booting	Software modification is in progress (Total 75 locos):

SN	Item	Action plan	Remark
		time of 67 sec. as per governing specification.	locos already modified – 60 Balance loco – 15 (TATA-5, AQ/BSL-7, BIA-2, GZB-1) PDC: 31.07.2018.
6.	Gate Driver Unit (GDU) cards	Cases of communication failure between GDU and PEC cards - Resolved. Firm has informed that tolerance limit has been relaxed for generation of GD link error in Ver-38.	RCA report submitted, new cases under analysis. M/s ABB shall submit the new action plan along with investigation report by July'18 end.
7.	Failure of door guide pin arising after 2-3 years of service.	Modification in door guide pin which transfers eight on the door latch.	9 locos are pending for modification (TKD-1, GZB-1, TATA-1, BIA-2, VSKP-1 & AQ-3). PDC- 31.07.18.
8.	Communication between one traction converter to other is with optical fiber cable. In case of lifting of converter, fiber optic cable is forced to cut. Suitable connector is required to be used to facilitate lifting of converters without cutting the fiber optic cable.	Firm has indicated that spare OFC will be maintained at shed in case OFC connector needs to be cut to facilitate lifting of converter.	Firm agree to keep spare optical fiber cable to help sheds in case of lifting.
9.	The problem of dry solder in BA-Charger is observed in new converters.	Improvement of workmanship at firm's premises.	Replaced the identified busbar and there is no such incident repeated after replacement. Performance is under watch.
10.	Failure of IGBT modules of BUR Earthing to be done as per GTO locomotives.	Firm has provided earthing circuit in load side. Same needs to be provided as per GTO loco motives.	Total locos to be modified: 40 Locos modified: 27 Locos to be modified: 13 (BRC-1, TKD-1, BIA-1, VSKP-1, RPM-1, KYN-2 & AQ-6) PDC – July'18
11.	Coolant issues	Overflowing and discoloration of coolant was observed in 8 locomotives. Also corrosion issue have been observed in cooling circuit. These issues are related to coolant being used of bad quality having very less corrosion resistance	CLW has taken steps regarding the use of proper coolant. Suitable instruction in this regard shall be issued soon.

SN	Item	Action plan	Remark
		properties. Also intermixing of different make coolant may causing chemical reaction hence spilling and corrosion like issues.	

2.0 Other points:

M/s ABB was requested to update the position of action plan every month along with other details as discussed today and send the compliance every month on email dsetplgroup@gmail.com.


9/7/18

(Suresh Kumar)
DSE/TPL