Reliability meeting of M/s Medha make IGBT based Propulsion System fitted in 3-ph loco held at RDSO on 05.07.2018

Member Present

RDSO	M/s Medha
1. Shri O.P. Kesari, PEDSE	1. Shri Lokesh K.
2. Shri Suresh Kumar, DSE/TPL	2. Shri Venkateshwar Rao
3. Shri S.K. Deo, SSE/TPS-2	3. Shri Rajesh Kesharwani
4. Shri Ran Vijay, JE/TPS-1	

In this meeting, issues related to M/s Medha make IGBT based Propulsion System have been discussed. The detailed deliberations done during the meeting are given below:

1.0 M/s Medha make Propulsion System

1.1 Failure trend of M/s Medha make Propulsion System:

SN	Cause of Failure	No. of failures			
		2016-17	2017-18	2018-19 (Apr-Jun) Reported by Medha	
1	Card failure	0	8	3	1 No TCN card failed at ELS/TATA 31709. 1 No Aux converter INV CC Card was failed BRCY 30574. 1 No Voltage sensing card was failed at TATA 31902.
2	VCU problem	1	0	0	
3	Software Malfunctioning (Time out initialization, Time mis-match etc)	1	9	0	
4	Converter contactor	2	1	1	Contactor Stucked in Loco No 30626 ELS/GZB on 26-06-2018.
5	Power Module	3	9	1	1 No was failed at ELS/VSKP 31938.
6	TM speed sensors	0	4	2	Speed sensor tip damaged in loco no. 30521 & 30661. Mechanical Problem.
7	Loose connector / OFC/ Cable defective	0	0		
8	Others / Misc.	5	37	5	4 (30595,30603,30582,30583)cases coolant leakeages observed in ELS/LGD & 1 DC Link capacitor burst case observed at ELS/LGD 30605.
	Total	12	68	12	
	Population	9	83	106	
	FRPCPY	**150**	82	---	

1.2 Following issues are with M/s Medha make Propulsion System:

SN	Item	Action plan	Remark of Firm
1.	**Comprehensive maintenance tool:** As	Firm has said that only three nos. comprehensive	Details are already given to ELS/TATA, CNB & LGD.

	per the PO condition firm needs to submit the comprehensive maintenance tool.	tools to TATA-1, CNB-1 & LGD-1 have been given. Firm to submit the details/user manual of comprehensive maintenance tool to Railways, CLW and RDSO.	Sheds may have to confirm.
2.	**Bursting of capacitor:** In locomotive no 30553 at ELS/TATA the DC link capacitor burst, which led to failure of Power module.	Firm has informed that they have sent the failed DC link capacitor to Electronicon (Italy) and waiting for detailed investigation report.	Failure investigation is under progress. PDC - 31.07.18.
3.	**Mapping and logging of fault messages in DDS:** Instances of failure has been reported form sheds, ELS/TATA and ELS/LGD where it has been observed that either non-logging of fault messages in case of failure or logging of wrong messages taking place.	Firm has been advised to ensure proper logging of fault messages in case of failure/fault and submit the fault list and diagnostic data list to CLW and RDSO.	Firm have e-mailed the detailed fault description document to RDSO & CLW & Sheds. Sheds may indicate if the information provided is sufficient for troubleshooting.
4.	**Interoperability of MU units:** Multi-operation of locomotive of MEDHA with propulsion of BHEL is pending. Many attempts have been made at ELS/LGD to resolve the issue.	Firm has been advised to visit the ELS/LGD with M/s BHEL and test the Multi-operation at the earliest.	Multiple Unit between loco no. 31983 (Medha) and 31757 (BHEL) have been successfully completed under ELS/VSKP. The MU is under operation. Performance is under watch. CDAC-CDAC MU has been tested and trial on MU operation with C-DAC VCU and other make VCUs could be started.
5.	**Failure of MTCN Card:** Cases reported of failure of MTCN cards during multi formation of locomotive, firm introduced surge protection in cards 8 locos in ELS/TATA.	Performance under watch, firm to submit the failure report.	Firm stated that they have added surge protection device in TCN card, and modified all Locomotives. The performance is under watch.
6.	ELS/TATA has reported isolation of Aux converter	ELS/TATA has reported isolation of Aux converter with fault message "AC input frequency	Improved software has been provided in 35 locomotives (Apr'18), all software updated

		disturbance" and "DC link voltage high". The firm has modified the software and uploaded in 20 locomotives. Performance under observation.	locomotives working without any issues. Performance shall be monitored up to 31.07.2018 and further decision will be taken accordingly.
7.	**High ramp-up/ramp-down:** High ramp-up/ramp-down of 26 seconds to be reduced to 15 seconds as per existing MICAS logic and provided in 20 loco for trial, performance is under observation.	Software improvements done in Auxiliary converter to decrease the soft start time to below 20 sec by modifying ramp up time to 5Hz/sec earlier it was 2.5Hz/Sec. Improved software has been provided in 20 locomotives. Ramp up time further reduction up to 15 sec is under testing and same will be provided in locomotive once it has proven in lab	Software for reduction in ramp up time up to 15 sec has been configured in ELS/BRCY Loco No 30607. Firm may upload software in 5 more locos. Based on performance (minimum 1 month) the same will be implemented in all locomotives. PDC – 31.07.2018.
8.	Issues of Throttle not responding	Issues of Throttle not responding was resolved through Plausibility check error recalibrated as per MICAS logic. Trial and testing under observation at ELS/TATA.	Firm has implemented the logic as per existing Loco logic i.e full scale error 40% of full scale at all 3 positions in all ver-2 locomotives and to be implemented in ver-1 (29 nos.) locos. PDC- 31-07-2018
9.	**Failure of radiator:** Zonal railway reported several cases of failure of radiator unit only in MEDHA make propulsion system.	Firm has carried out modification by changing in the piping scheme duly providing a connection to expansion tank from the radiator outlet in addition to one provided from pump suction to expansion tank. Five locomotives (4-ELS/LGD, 1-ELS/GZB) have been modified and the performance is under watch.	Firm has submitted the investigation report to RDSO & CLW. CLW has issued guidelines for selection and maintenance of coolant. Same shall be followed as per CLW guidelines to address these failures.
10.	**Draining of battery:** Northern railway reported fast rate of draining of battery causing fatal error	It was observed that the some of the sub-system such as DDU keep on in standby mode even after BL key is in off	Earlier, the DDU use to remain in power even when the loco is shut down. Changes have been done to switch OFF DDU when BL

	of the locomotive.	position. Firm advised to review the design to address the issue as this is not required.	Key OFF condition. Same feature has been implemented in 35 locos. This feature shall be implemented in remaining loco by 15.08.2018.

2.0 Other points:

M/s Medha 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.

(Suresh Kumar)
DSE/TPL