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No. EL/11.5.5/21

Date: 16.11.2018

M/s. CG Power and Industrial Solution Limited,  
Plot No. 9, MPAKVN Phase-2,  
New Industrial Area, Mandideep – 462046.

Sub: Minutes of the Meeting held at RDSO, Lucknow on 16.11.2018 on Reliability of  
M/s CGPISL make IGBT based converters fitted in three phase electric  
locomotives.

Please find enclosed herewith a copy of Minutes of the Meeting held at RDSO, Lucknow on  
02.11.2018 on Reliability of M/s CGPISL make IGBT based converters and TCN-VCU fitted in  
three phase electric locomotives for information and necessary action.

*Suresh Kumar*  
16/11/18  
(Suresh Kumar)

Encl: As above.

For Director General (Elect.)

Copy to:

1. Secretary (Electrical), Railway Board, Rail Bhawan, New Delhi-110 001.  
(Kind attn.: Shri A.K. Goswami, DEE/RS): For kind information.
2. Principal Chief Electrical Engineer, (For information and necessary action)
  - 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 – 751 017
  - 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
  - Chittaranjan Locomotive Works, Chittaranjan – 713 331(WB)
  - Diesel Locomotive Works, Varanasi-221004

*Suresh Kumar*  
16/11/18  
(Suresh Kumar)

Encl: As above.

For Director General (Elect.)



## Minutes of meeting between CGPISL and RDSO on issues related propulsion System

	Issue related to equipment	Action Plan
<b>Traction Converter</b>		
1	Failures of power module and its connectors. Out of 69 locomotives 33 locomotives has been modified for cliplam connections to bus bar connections.	Remaining 36 locomotives to be modified target date is Dec-2018. ( BNDM: 12, GMO: 13, LDH: 03, NKJ: 07 and KZJ: 01 ).
2	Issues with UTIZEN CPU electronics. The problem of isolation of motors/bogie, isolation of harmonic filter, non-logging of fault data in line with the VCU data could not be set right so far on converters with UTIZEN electronics.	Software modification for utizen electronics to be completed by Dec-2018.
3	Repeated failure of balancing Resistor / pre-charging resistor of SR. More than 70 cases of overheating of balancing resistors of M/s Kiyosh make have been experienced but no investigation report could be given by the firm so far. M/s HVR Pentagon (imported) make resistors have been used as alternative which also failed.	CGPISL state that these resistors are connected across the DC link and equally share the voltage and there is continuous flow of current but in case of fault condition complete current flows from single resistor thus result into overheating of resistor. CGPISL is proposing two alternate solutions for resolving this issue. i) Increasing the diameter of resistor from 54mm to 80mm to improve its heat dissipation capacity. ii) Adding of two resistor of 1.95K $\Omega$ each in cascaded in place of single resistor (3.91K $\Omega$ ), this will help in sharing the voltage and improve its heat dissipation capacity.  It has been decided that 5 locos in RPM for modification (i) and 5 locos in BNDM for modification (ii) to be modified and monitoring the performance. To be completed by 30.11.2018.
4	TE / BE reduces to zero	For this CGPISL requires uploading the solution in two locomotives at ELS/RPM for few days to collect the data and tuned the parameter. PDC: 20.11.18  CGPISL will provide remote monitoring system in 1 loco at RPM for continuous monitoring. PDC: 30.11.18





## Auxiliary Converter

1	CGPISL has carried out modification in the INVCC and CCPU card. Still card failures are there. The card failures are with message battery charger current less than 10 Amp. And BUR current greater than maximum and inverter fault.	Firm has modified the software and will provide this software in Five locomotives each at four locations RPM, TKD, HWH and GMO. PDC: 30.11.2018
1-A	BUR current greater than Maximum still to be resolved.	<p>BUR current greater than Maximum</p> <p>M/s CGPISL's Observation/Analysis: If the Auxiliary winding drawing more current than 400A, then power converter-1/2 declare the fault 'BUR CURRENT MAX' or 'AUXILIARY WINDING OVER CURRENT'. This fault message with priority 1 appears on the display in the driver's Cab. This happens during neutral zone negotiation when all 3 BURs are functioning at full power (or at ventilation level 3).</p> <p>Solution: CGPISL shall modify the software which will help in keeping the cumulative current of all three BURs below 400Amp. Modified software is to be downloaded in five (05) locos each at ELS/HWH, RPM, HWH &amp; TKD. PDC: 20.11.2018.</p>
1-B	'Battery charge current below 10A' is still unresolved.	<p>M/s CGPISL's observation/Analysis: The cause of this problem is variation in FWR which is affecting the output voltage of inverter. The variation in the FWR affecting the Harmonic oscillator causing output voltage variation. FWR signal decides the frequency of the output of auxiliary converter. It has been observed that there is variation in the FWR signal which causes variation in output frequency and subsequently to the output voltage. As the BA charger is fed by the output of auxiliary converter, the variation in the output voltage was causing inadequate charging particular during the compressor ON/OFF/ON.</p> <p>Solution suggested by M/s CGPISL: (i) Software low pass filter and averaging of 10 samples including circular buffer implemented. (ii) Saturation of FWR implemented above 49Hz. It will be treated as 50Hz above 49 to 51Hz. Modified software is to be downloaded in five (05) locos each at ELS/HWH, RPM, GMO &amp; TKD. PDC: 20.11.2018.</p>

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Auxiliary Converter		
2	In CGPISL make auxiliary converters after neutral section the frequency ramps down and takes near about 10 seconds to reach zero frequency. If driver close DJ within 5 seconds before frequency coming down below 35 Hz, auxiliary converter over current message appears and immediately DJ trips.	CGPSIL has to study the issue and propose the solution by 15.12.2018.
3	Generation of inverter fault due to variation in machine room temperature.	Issue was raised by NR. CGPISL stated that 115 degree Centigrade is the set limit. This issue needs to be discussed with ELS/GZB.
	<b>CDAC VCU supplied by CGL.</b>	
1	Issues regarding C-DAC VCU	<p>CGPISL, ABB, C-DAC, RPM Shed should work on the findings on the issues and take the corrective action at RPM make the joint note and observation to enable fault free operation of TCN-VCU.</p> <p>CGPISL stated that Team from C-DAC, CGPISL, ABB, RPM, are available in RPM for collecting the data and doing the trials at RPM. Team will write down the observations and submit proposed action plan to RDSO by 26.11.2018.</p>

  
16/11/18  
DSE/TPS