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Government of India
Ministry of Railways
Research, Designs &
Standards Organization,
LUCKNOW - 226011



No. EL/1.2.9.1

Dated: 21.03.2018

Principal Chief Electrical Engineer,
All Zonal Railways & CLW.

Sub: Minutes of Performance Review Meeting of 180 KVA
Static Converter held ELS/TKD/WCR on 16.03.2018

The minutes of review of performance meeting of 180 KVA Static Inverter held at held ELS/TKD/WCR on 16.03.2018 is enclosed herewith for kind information and necessary action. Compliance for the items mentioned as action plan may be sent quarterly. Next review meeting shall be held in July 2018.

Uk
21/3/2018

(Aseem Kumar)

for Director General/Elect.

Encl: As above

Copy to:

1. Secretary (Elect.), Railway Board, Rail Bhawan, New Delhi- 110 001
- Kind attention : **Sri A.K.Goswami DEE/RS/Railway Board.**
2. M/s. Autometers Alliance Ltd., C-63, Sector - 57, Noida - 201 307
3. M/s. Siemens Ltd., Industry Sector, Mobility Division, I MO RS IS, 5th Floor, R&D Centre Building, Kalwa, Thane, Mumbai - 400 601
4. M/s. Medha Servo Drive Pvt. Ltd, P-4/5B, IDA Nacharam, Hyderabad - 76
5. M/s. Hind Rectifier, Lake Road, Bhandup (W), MUMBAI - 400 0785.
6. M/s.ABB Limited, Survey No 88/3, 88/4. Basavanhalli Kasaba Hobli, Nelamangala Taluk, Bangalore 562 123.

- for kind information and necessary action please.

Uk
21/3/2018

(Aseem Kumar)

for Director General/Elect

Encl: As above

o/c

**Minutes of Performance Review Meeting of 180 kVA Static Converter held
at ELS/TKD/WCR on 16.03.2018**

Present: As per list enclosed.

PED/SE/RDSO welcomed all the participants of railways and industries who joined the meeting for 180 KVA Static converter at ELS/ TKD/WCR.

(A) Performance review:-

Discussions were held on progress of modifications & failure analysis presented by RDSO based on the data taken from the sheds which are as follows:-

1.0 M/s AAL		Action to be taken by firm & Railways
SN	Items	
1.1.	MCU Card: Sudden voltage changes across QCON relay contact which leads to sticking up of QCON relay contact, hence MCU failures are there.	1. Firm stated that they have provided RC damping network across Q-CON relay and use of higher rated reed relay in all the units. As per firm the modification is complete in all units. 2. Maximum failures (06 failed out of 12 failures) were reported by SCR. Amongst 06 failed cards firm investigated one unit and reported that dust particle were in the leg of IC and this was the root cause of the failure. It is recommended by RDSO that the failed cards may be rehabilitated through OEM and firm should give warranty of minimum 02 years from the date of commissioning. This was also discussed in the meeting held at RDSO dated 11.07.17 and recorded in MOM dated 17.07.2017. It is also suggested that sheds should send failed MCU card to firm for investigation and a joint note should be prepared with the firm's representative and shed official.
1.2.	Cooling Fans: 1. Reasons of cooling fan failure were mainly due to bearing failures, and burning of motor winding. Firm has developed new designed cooling fan (Havells make) and validated in field trials. (Firm	1. Zonal railways have reported that there are no failures of modified cooling fan (Havells make). 2. RDSO also issued modification sheet no RDSO/2016/EL/MS/0449 Rev "0" dated 30.03.2016. 3. It is advised by RDSO to complete the conversion of ZIEHL-ABEGG cooling fan to modified one so that the failures due to cooling fan can be reduced. Firm

	supplied 184 units of (Havells make) and sold 168 KIT to railways Total – 352 units.	stated that Havells make cooling fan was introduced in 2012 after the performance review meeting held at Railway board on 07.02.2012 (MOM circulated vide letter no EL/1.2.9.1 dated 13.02.2012). The ZIEHL-ABEGG fans are to be replaced after a service period of about 06 years. During the meeting firm stated that the life of bearing shall be 06 years or more in Havells make cooling fan provided by them.
1.3.	ZCT: Cable of AC choke was passing just beneath the ZCT leading to erratic operation of ZCT due to variation. Also, mechanical stresses developed on the core of ZCT.	1. It was recommended that ZCTs of DEESYS make of Korea will be replaced by ZCT of M/s. Broycee Control of England. There is reduction in failures of ZCT's. Firm has replaced 100 defective units. Rlys. Have to replace remaining ZCTs of DEESYS make by M/s. Broycee Control. 2. The modification status as reported by ZR's is 326 units completed out of 693 units.
1.4	GDU card: GDU card of inverter and battery charger are failing due to decrease in winding resistance & voltage range of Pulse transformer and deterioration of capacitance value of capacitors particularly after 5 years of service.	1. Failures of GDU cards have shown a high increase. RDSO vide MOM dated 17.07.2017 advised ZR's for replacement of capacitors after a service period of 6 years and replacement of Pulse transformer if winding resistance and voltage range is beyond limit. 2. Firm has agreed to repair/ rehabilitate failed GDU cards of inverter and battery charger during AMC. As on date failed cards may be repaired from OEM and firm will give warranty of minimum 02 years from the date of commissioning.
1.5.	DCCT/ CHCT: There have been failures of CTs. All failures were of ABB make defective batch	1. Firm stated that they have replaced defective batch of CTs. and it is recommended that Shed should confirm this again. In future replacements of CT's are to be done with LEM make CT's by the shed. 2. The modification status reported by ZR's is 317 units completed out of 387 units.

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2.0	M/s Siemens		Decisions/ Target
SN	Item		
2.1	Indigenized Battery charger: Indigenized Battery charger failed due to failure of rectifier module due to Diode getting open circuit.		1. Firm has modified rectifier section in their Indigenized Battery charger. As per firm's letter LUC/MO CS RS/446/MKG dated 07.11.2017 all units have been modified, hence no such failures on battery charger are being reported by railways.
2.2	Cooling fan The cooling fan of M/s Siemens failed due to bearing failures and Jam. Firm stated the major failure of cooling fan bearing is due to either improper mounting or improper maintenance.		<p>1. Firm has advised that the bearing of cooling fan is to be replaced after a service period 4.5 years. The failures in ELS/ED/SR are more. It is suggested that firm's senior engineer should visit ELS/ED as early as possible to investigate the causes of failure and if required demonstrate the guideline of the procedure of cooling fan maintenance as issued by RDSO vide RDSO letter no EL/1.2.9.1 dated 29.04.2016. The quality audit so done should be reported along with joint note to RDSO.</p> <p>2. It is advised that Zonal railways should replace bearing as per OEM recommendation ie 4 to 4.5 years and follow the guideline of the procedure of cooling fan maintenance as issued by RDSO vide RDSO letter no EL/1.2.9.1 dated 29.04.2016.</p> <p>3. The modification status as reported by ZR's is 690 units completed out of 786 units.</p>
2.3	Inverter The failures of inverter module are repetitive due to various reasons like component failures, IGBT failure etc.		The failures in Inverters are still persisting. M/s Siemens have to investigate the problem and submit the action plan so that the failures in Inverter can be reduced. Though in MOM dated 17.07.2017 M/s. Siemens were advised the same but the firm stated that there is no clear trend. Hence, firm is again advised to investigate thoroughly.
2.4	DCCT		It is recommended by RDSO that if

		DCCT of ABB make failed it is to be replaced by LEM make by M/s. Siemens during AMC. Though no failures of DCCT of ABB make fitted in SIV of SIEMENS make has been reported by railways.
.5	Report by shed	ELS/RPM reported that there are failures in isolation transformer base plate in 04 units. It is advised that the representative of M/s. Siemens should visit ELS/RPM within 07 days and replace the channel of isolation transformer with job completion report.

3.0 M/s. Medha Servo Drive		
SN	Item	Decisions/ Target
3.1	TDC-IF Card: The tripping of SIV occurred due to sensing over voltage of OHE though OHE voltage was below specified limit.	1. It is advised to firm that remaining modification of TDC IF card is to be completed within 15.04.17. 2. The modification status as reported by ZR's is 307 units completed out of 326 units.
3.2	dv/dt capacitors	The dv/dt capacitors failures are reported by SCR. OEM stated that Shed replaces the capacitors whose capacitance values are less than 10% though it is recommended to replace the capacitors after a service period of 4 to 5 years or if the value is less than 20%. It is requested that all railways should follow the recommendation of OEM as also recorded in MOM dated 17.07.2017.2. The modification status as reported by ZR's is 124 units completed out of 227 units.

4.0 M/s. Hind		
SN	Item	Decisions/ Target
4.1	QCON timer card : Initially wiring of delay timer was tapped from secondary of Auto transformer at $380 \pm 5\%$ V but the voltage spikes use to melt the fuses	1. The firm stated that they have completed the modification in 255 units out of 301 units. It is advised that remaining units should be modified within 15.04.2018. The replacement of electrolytic capacitors in Battery charger MC card is also to be

	sometimes.	completed within 15.04.2018.
4.2	Crow Bar Thyristor: The problem was unwanted firing pulse to crow bar thyristor. Firm introduced an energy absorption unit.	1. Firm has introduced energy absorption unit in 219 units out of 301 units. It is advised that remaining units should be modified within 15.04.2018.
4.3	Snubber capacitor: The capacitance value (0.47 mF) of Snubber capacitor is deteriorating after a service period of 3 to 4 years of service to 0.5 nano farad.	1. The capacitors are Oil filled and are to be replaced by dry type. It is recommended by RDSO that Loco shed will check the value of snubber capacitors during maintenance and replace them if required. 2. The modification reported by ZR's is status 181 units completed out of 308 units.
4.4	Cooling Fan : The basic problem is bearing failure. All the bearing failures are after a service period of 4 years.	1. Zonal railways are advised to replace bearing as per OEM recommendation ie after a service period of 4 years. 2. The modification status as reported by ZR's is 234 units completed out of 301 units. 3. ELS/Angl reported that cooling fan. Firm has been advised to bearing fitted in SIV of M/s. Hind Rectifier of loco no 28738 failed within 02 years investigate the failure of cooling fan bearing and make a joint report.

5.0	M/s ABB	
SN	Item	Decisions/ Target
5.1	Cooling fan: Mainly there are failures due to jamming of bearings.	1. Firm stated that the cooling fan bearings are failing after a service life of 04 years and advised that they are to be replaced after a service period of 04 years. 2. The modification status as reported by ZR's is 27 units completed out of 108 units. 3. It is recommended that Zonal railways should follow the recommendation of OEM regarding replacement of cooling fan bearing.

(B) Annual Maintenance Contract .

1.0 The detail of tenders/ LOA floated by railways is shown below:-

RLY	shed	AAL	SIEMENS	MEDHA	HIND	ABB
CR	AQ					
	BSL		41		6	
	KALYAN					
ECoR	ANGUL			16		
	WAT					
ECR	MGS		LOA Awaited	26		Tender to be opened on 04.04.18
	GMO					
ER	ASN		8	6		
	HWH		29	6		
NCR	CNB					
	JHS		LOA Awaited			
NR	GZB					
	LDH					
	SRE					
SCR	BZA			34		
	LGD					
	KZJ			26		
SECR	BIA					
SER	BNDM		LOA Awaited	4		15 no. LOA Awaited
	SRC		29	3		
	TATA		LOA Awaited			
	BKSC					
SR	AJJ		40	7		
	ED			13		
	RPM		26			
WCR	NKJ					
	TKD					
	ET					
WR	BR C		LOA Awaited	1		LOA Awaited
	BL		LOA Awaited			
TOTAL		0	173	142	6	0

2.0 All the firms reported that the railways are deviating from the conditions mentioned in RDSO SMI for AMC of SIV. It is suggested that the clauses of AMC may be reviewed after a year of implementation of AMC if required. ZRs are also requested not to include any additional conditions.

3.0 Firm requested to club the locomotives in a zone or region where ever sheds are having less than 05 units of a particular make so that it will be easier to take AMC. This point was deliberated and found that some sheds are having only 01/02 units of a particular make. ZR's may transfer the locomotive to one shed in their zone in such cases.

The discussion held regarding conditions in AMC are as below:-

1.1	AAL	<ol style="list-style-type: none"> 1. OEM requested their inability to take AMC of K -2 and K-3 model as spares of these models are not available. These models are about 100 units in service. 2. Firm stated that the local modified (MVSI, MVSL) cooling fan will not be in the scope of AMC. It is recommended that the units which are having local modified cooling fan may not be taken in the scope of AMC but firm has to provide appropriate rebate on these units. But if any problem arises then OEM will attend with the assistance of loco shed. 3. In the case of ZCT – Shed will replace the defective ZCTs in phased manner and the work of AMC should continue.
1.2	Siemens	<ol style="list-style-type: none"> 1. OEM requested their inability to take AMC of TCD model as spares of these models are not available. Only two electric loco sheds (ELS/CNB/NCR & ELS/BNDM/ SER) are having TCD units which are about 42 units in service. 2. As per RDSO guide line Proper locking of input isolator / Removal of input Isolator is to be done by shed for SIV's supplied upto 2009 wherever isolator exists . This work may not be taken in the scope of AMC. If any unit is found with improper locking of input isolator / non removal of Isolator, firm will assist shed engineers to do the needful. It is also recommended that loco sheds may make a plan for removal of input isolator and proper locking is to be done by bus-bar or power cable. 3. It is reported by ELS /RPM/ SR that loco no22845under AMC failed 04 times for different causes and proper investigation has not been carried out. Same has also been reported by ER for loco no 23350 of ASN which failed 04 times in 2017-18, Firm is advised to depute senior experienced officials to investigate such kinds of failures and prepare a joint note with action plan.
1.3	Hind Rectifier	<ol style="list-style-type: none"> 1 OEM reported that some railways are asking to take the AMC of the non-working units as well as the spare units kept in shop floor. It is recommended that railway may follow clause no 5.5 of SMI which says "AMC will be carried out for SIV units in working condition".

The Meeting concluded with vote of thanks and the chair expressed his gratitude to ELS/TKD/WCR for arranging the meeting with a short notice.

(C) List of participants:-

SN	Name (S/Shri)	Designation	Railway
1	O.P. Kesari	PED/SE/ RDSO	RDSO
2	Aseem Kumar	DSE (PS & SC)	RDSO
3	Rahul Pachori	Sr.DEE/TRS/TKD	WCR
4	Gajendra Kumar	Sr.DEE/TRS/BZA	SCR
5	Ashish Kumar Maddhesiya	SEE/CON/CLW	CLW
6	Nikhil Singh	DEE/TRS/BSL	CR
7	Bachu Ramesh	DEE/TRS/RPM	SR
8	Puneet Jaif	DEE/TRS/TKD	WCR
9	G.K. Srivastava	ADEE/RS/TKD	WCR
10	Ratnesh Srivastava	AEE/TRS/CNB	NCR
11	A.K.Saini	ADEE/RS/JHS	NCR
12	Susant Kumar	ADEE/TRS/NKJ	WCR
13	Jay Prakash Pal	ADEE/TRS/HWH	ER
14	Kapil Deo	ADEE/TRS/LDH	NR
15	Praveen Kumar	AEE/RS/GZB	NR
16	Deepak Kumar	AEE/RS/MGS	ER
17	P.K. Sharf	AEE/RS/BIA	SECR
18	Aswani Kumar	SSE/TRS/LDH	NR
19	M.L.Malviya	SSE/TRS/TKD	WCR
20	R.K. Chauhan	SSE/TRS/TKD	WCR
21	L.B. Singh	SSE/TRS/TKD	WCR
22	Munish Kumar	JE/TRS/TKD	WCR
23	Bishikeshan Pradhan	SSE/TRS/ANGL	ECoR
24	Saumya Ranjan Sahu	SSE/TRS/ANGL	ECoR
25	S.Srinivas	SSE/TRS/VSKP	ECoR
26	Ram Avtar Pal	SSE/TRS/ET	WCR
27	Madhur Pandey	SSE/TRS/JHS	NCR
28	Ambuj Sharma	SSE/TRS/CNB	NCR
29	Dhananjay Kumar	SSE/TRS/BSL	CR
30	Sukant Singh	SSE/TRS/BZA	SCR
31	T.L. Sahu	SSE/TRS/BIA	SECR
32	Pradeep Gupta	SSE/TRS/BRC	WR
33	Ajay Richharya	SSE/Tech/GZB	NR
34	Bhupal Singh	SSE/TRS/TKD	WCR
35	Indrajeet Sharma	JE/TRS/TKD	WCR
36	R.K. Meena	Tech/TRS/TKD	WCR
37	Raktim Sarkar	Chief Manager	Siemens
38	Rajesh Srivastava	Chief Manager	Siemens
39	Manu Garg	Manager/ Service	Siemens

40	V.K.L. Swamy	Product Engr / Medha	Medha Servo Drive
41	Vikash Jha	Marketing/Engg Medha	Medha Servo Drive
42	Pramit Gupta	Asst. Engr	Medha Servo Drive
43	Pradeep Kumar	Asst. Mktr.	Medha Servo Drive
44	R.K.Verma	AVP/Mktg	ABB
45	Animesh Mathur	Product responsible	ABB
46	Mohit Sharma	Service	ABB
47	A.K. Shrama	Manager	AAL
48	Akhter Alam	Asst Manager	AAL
49	Manish Garg	Accounts Head	AAL
50	Deepak Aher	Manager service	Hind Rectifier
51	Nitin Saini	Sr. Engr	Hind Rectifier
52	Himanshu Shukla	Sr. Engr	Hind Rectifier
