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No. EL/2.2.70

Date 28.09.2018

Chief Electrical Engineer,

- Central Railway, Mumbai CST-400 001.
- Northern Railway, Baroda House, New Delhi-110 001.
- North Central Railway, Hastings Road, Allahabad- 211001
- Eastern Railway, Fairlie Place, Kolkata -700 001.
- East Central Railway, Hazipur-844101.
- East Coast Railway, Chandrashekharpur, Bhubaneswar-751016.
- Southern Railway, Park Town, Chennai-600 003.
- South Central Railway, Secunderabad-500 371.
- South Eastern Railway, Garden Reach, Kolkata -700 043.
- South East Central Railway, Bilaspur-495004
- Western Railway, Churchgate, Mumbai-400 020.
- West Central Railway, Jabalpur-482001.
- North Eastern Railway, Gorakhpur - 273 001
- North Frontier Railway, Malegaon Guwahati - 781 011
- North Western Railway, Jaipur - 302 006.
- South Western Railway, Hubli - 580 023
- Chittaranjan Locomotive Works, Chittaranjan-713 331 (WB).
- Diesel Locomotive Works, Varanasi - 221 004

Sub: Minutes of Performance Review Meeting of Carbon Brushes for Hitachi TMs held at ETC/CNB on 07.09.2018.

The minutes of performance review meeting for Carbon Brushes of Hitachi TMs held at ETC/CNB on 07.09.2018 had been issued and may be downloaded from RDSO website using following path:

<http://www.rdso.indianrailways.gov.in> → Directorates → Electric Loco → Reliability meetings → TM/MSU/Bearings → EL/2.2.70 dated 28.09.2018.

This is for your kind information please.

(Signature)
28.9.18

(P.K.Saraswat)

for Director General/Elect.

Copy to:

1. Secretary (Elect.), Railway Board, Rail Bhawan, New Delhi- 110 001
(Kind attention: **Sri A. K. Goswami**DEE/RS/RB): For kind information please.
2. M/s Assam Carbon Products Ltd, 407, Meghdoot Building, 94, Nehru Place, New Delhi
3. M/s Mersen India Pvt. Ltd., 98/5, Wheeler Road, Coketown, Bangalore
- for information and necessary action please.

(Signature)
28.9.18

(P.K.Saraswat)

for Director General/Elect

Encl: As above

MOM_CarbonBrush_11072017

Minutes of Performance Review Meeting of Carbon Brushes of Hitachi TM at ETC/CNB on 07.09.2018

Present: As per list enclosed as Annexure - I.

1. At the outset, DSE/TM/RDSO welcomed all the participants of the meeting. He expressed concern about high rate of failures of Carbon Brushes of Hitachi TMs and advised Carbon Brush Manufacturers to improve the reliability. CLW is advised to monitor the performance of carbon brushes as vendor control of carbon brushes has been transferred from RDSO to CLW.
2. Carbon Brush of Hitachi Traction motor is governed by RDSO Specification No. ELRS/SPEC/CB/0027 Rev '0' of September 2003. Following three grades are approved for Carbon brushes of Hitachi Traction motors:
 - a) EG 105 (S) (imported & indigenous grade) of M/s Assam Carbon Products Ltd.
 - b) EG 9049(imported grade) of M/s Mersen India Pvt. Ltd.
 - c) EG 8220(indigenous grade) of M/s Mersen India Pvt. Ltd.
3. Failure details of Carbon Brushes for Hitachi Traction motors are not received from ELS/TATA & ELS/BKSC. ELS/SRC had submitted the failure details only for FY 2016-17.
4. **Performance and failure analysis of Carbon Brushes:**
 - a. Performance of EG-105(S) grade is given below :

Rly/Shed	Year: 2015-16			Year : 2016-17			Year 2017-18		
	P	F	%F	P	F	%F	P	F	%F
CR/BSL	3865	58	1.50	2641	9	0.34	2372	33	1.39
CR/KYN	7506	30	0.40	7506	23	0.30	720	223	30.97
CR/AQ	3834	0	0.00	4887	0	0.00	4455	0	0.00
ECOR/VSKP							1134	4	0.35
ECOR/ANGL	1620	08	0.49	0	0	0.00	480	0	0
ECR/MGS	-----						2268	14	0.60
ECR/ GMO	0	0	0	3488	0	0.00	22374	0	0.00
ER/ASN	4248	0	0.00	3330	0	0.00	5886	0	0.00
ER/HWH							6444	10	0.16
NCR/CNB	0	0	0	0	0	0.00	18000	0	0.00
NCR/JHS	21924	0	0	16704	0	0.00	15480	3	0.01
NR/LDH	2000	58	2.90	17712	242	1.36	7992	162	2.02
NR/GZB	0	0	0	324	0	0.00	3564	0	0.00
NR/KJGY	-----						1296	0	0.00
SCR/KZJ	7956	0	0.00	11070	11	0.09	13896	30	0.21
SCR/BZA	5320	8	0.15	15287	204	1.33	18324	119	0.65
SCR/LGD	2016	36	1.78	4180	0	0	4320	4	0.09
SECR/BIA	8343	0	0.00	12258	0	0.00	11394	0	0.00
SER/SRC				0	0	0.00	15818	3042	19.23
SER/BNDM	6208	4	0.06	2052	0	0.00	3024	0	0.00
SER/TATA	756	12	1.58	0	0	0.00	-----		
SR/AJJ	5286	2	0.04	2444	49	2.01	2813	294	10.45

SR/ED	56688	113	0.2	3582	67	1.87	9792	461	4.70
SR/RPM	711	7	0.98	864	52	6.02	5400	144	2.66
WCR/ET	3000	102	3.4	1000	0	0	500	0	0.00
WCR/NKJ	12539	582	4.64	7128	89	1.2	3222	93	2.88
WCR/TKD	1044	0	0	1602	0	0.00	108	0	0.00
WR/BRC	13080	396	3.03	7992	76	0.95	8946	303	3.38
WR/BL	12082	2	0.02	14346	4	0.03	11264	5	0.04
Total	178982	1428	0.80	140397	826	0.58	201286	4944	2.46

(P- Population, F- Numbers of failures, %F- FRPCPY)

b.Performance of EG 9049 gradeis given below:

Rly/Shed	Year : 2015-2016			Year: 2016-17			Year : 2017-18		
	P	F	%F	P	F	%F	P	F	%F
CR/BSL	220	0	0.00	1260	0	0.00	0	0	0.00
CR/KYN	1008	0	0.00	1008	0	0.00	0	0	0.00
CR/AQ	1755	0	0.00	324	0	0.00	0	0	0.00
ECoR/ANGL	0	0	0	0	0	0	6	0	0
ECR/MGS							648	6	0.90
ECR/ GMO	6300	0	0.00	2596			0	0	0.00
ER/ASN	4860	0	0.00	4788			2034	0	0.00
ER/HWH				0	0	0.00	0	0	0.00
NCR/CNB	0	0	0.00	0			864	0	0.00
NCR/JHS	396	0	0	504	0	0	1062	0	0.00
NR/LDH	12500	108	0.86	0			0	0	0.00
NR/KJGY							0	0	0.00
NR/GZB	4790	0	0.00	2474			0	0	0.00
SCR/KZJ	7396	0	0.00	4351	1	0.02	2322	0	0.00
SCR/BZA	950	24	2.52	108	0	0.00	0	0	0.00
SCR/LGD	1381	0	0	270	0	0.00	0	0	0.00
SECR/BIA	1476	0	0.00	90	0	0.00	36	0	0.00
SER/TATA	648	0	0.00	-----			-----		
SER/BNDM	3282	0	0	1620	0	0	0	0	0.00
SER/SRC				----			0	0	0.00
SR/AJJ	8280	0	0.00	5229	5	0.10	392	0	0.00
SR/ED	28198	197	0.70	180	0	0.00	54	0	0.00
SR/RPM	2196	46	2.09	0	0	0.00	0	0	0.00
WCR/ET	600	3	0.5	0	0	0	0	0	0.00
WCR/NKJ	4548	58	1.280	234	0	0	0	0	0.00
WCR/TKD	2052	0	0.00	0	0	0	0	0	0.00
WR/BRC	1482	30	2.02	0	0	0.00	0	0	0.00
WR/BL	4032	2	0.05	3420	0	0.00	4024	2	0.05
Total	96298	468	0.49	28456	6	0.02	11622	8	0.06

(P- Population, F- Numbers of failures, %F- FRPCPY)

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c. Performance of EG 8220 grade is given below:

Rly/Shed	Year : 2015-2016			Year: 2016-17			Year : 2017-18		
	P	F	%F	P	F	%F	P	F	%F
CR/BSL	694	3	0.43	2578	58	2.24	2542	60	2.36
CR/KYN	4446	42	0.94	4446	76	1.70	11700	866	7.40
CR/AQ	243	0	0.00	621	8	1.29	1431	33	2.30
ECoR/ANGL	13608	0	0	16200	72	0.44	498	0	0.20
ECoR/VSKP							1926	13	0.67
ECR/MGS							342	4	1.20
ECR/ GMO	288	1	0.34	180	12	6.70	2682	0	0.00
ER/ASN	2016			2682	15	0.56	2880	0	0.00
ER/HWH							3384	50	1.48
NCR/CNB	21924	6415	29.26	21924	8131	37.06	1000	----	----
NCR/JHS	36	0	0	5148	10	0.19	5814	9	0.15
NR/LDH	7640	36	0.47	198	20	10.10	9720	84	0.85
NR/KJGY							1080	1	0.09
NR/GZB	4790	0	0.00	1198	0	0.00	108	0	0.00
SCR/KZJ	1820	2	0.11	1859	21	0.86	1872	0	0.00
SCR/BZA	10980	222	2.02	2498	75	3.00	1224	25	2.04
SCR/LGD	1408	0	0	288	0	0	0	0	0.00
SECR/BIA	2925	0	0.00	396	0	0.00	1314	0	0.00
SER/SRC							2704	0	0.00
SER/BNDM	11560	6	0.05	19008	52	0.27	17064	40	0.23
SER/TATA	7776			7020	308	4.38	-----		
SR/AJJ	18	0	0	7097	797	11.23	12267	960	7.82
SR/ED	27182	306	1.13	21366	2155	10.08	11988	181	1.50
SR/RPM	552	15	2.72	2007	303	15.10	3888	83	1.51
WCR/ET	5000	205	4.1	7100	311	4.38	7600	199	2.61
WCR/NKJ	3217	23	0.71	12942	360	2.78	17082	357	2.08
WCR/TKD	0	0	0.00	1530	5	0.327	3132	2	0.06
WR/BRC	5478	462	8.43	3942	10	0.25	3348	0	0.00
WR/BL	950	3	0.32	702	7	0.99	804	6	0.74
Total	134551	7753	5.76	137845	13005	9.43	129394	2974	2.30

(P- Population, F- Numbers of failures, %F- FRPCPY)

5. Defects which contributes to failures of carbon brush are classified in following four types:

Type	Nature of Defects
Type-1	Uprooting of Pigtail
Type-2	Pig tail over heated/melted/excess wear
Type-3	Chipping
Type-4	Breakage

6. Type wise segregation of carbon brush failures is given below:

a. Type wise segregation of carbon brush failures for EG105(S) grade

Year	Grade EG 105 (S)					
	Population	No. of Failure	Type-1	Type-2	Type-3	Type-4
2015-16	180026	1428	78	357	653	340
2016-17	140397	826	256	97	284	189
2017-18	201286	4944	1621	249	633	2441
Total	521709	7198	1955	703	1570	2970

b. Type wise segregation of carbon brush failures for EG 9049 grade

Year	Grade EG 9049					
	Population	No. of Failure	Type-1	Type-2	Type-3	Type-4
2015-16	96298	468	156	77	161	74
2016-17	28456	6	0	0	6	0
2017-18	11622	8	2	4	2	0
Total	136376	482	158	81	169	74

c. Type wise segregation of carbon brush failures for EG 8220 grade

Year	Grade EG 8220					
	Population	No. of Failure	Type-1	Type-2	Type-3	Type-4
2015-16	134551	7753	3778	2284	1008	683
2016-17	164930	12806	3893	6222	1844	847
2017-18	129394	2974	777	668	1016	513
Total	428875	23533	8448	9174	3868	2043

d. Cumulative type wise segregation of carbon brush failures (2015-18)

Grade	Year : 2014-2017					
	Population	No. of Failure	Type-1	Type-2	Type-3	Type-4
EG105S	521709	7198	1955	703	1570	2970
EG9049	136376	482	158	81	169	74
EG8220	428875	23533	8448	9174	3868	2043
Total	1086960	31213	10561	9958	5607	5087

7. Grade wise Wear Rate of carbon brushes is given below:

a. Wear rate of EG 105(S) grade

Rly/Shed	2015-2016		2016-2017		2017-2018	
	P	WR	P	WR	P	WR
CR/BSL	3865	1.95	2641	1.62	2372	2.15
CR/KYN	7506	3.43	7506	3.42	720	2.85
CR/AQ	3834	2.38	4887	2.58	4455	2.40
ECOR/VSKP					1134	2.02
ECOR/ANGL	1620	2.50	0		480	2.17
ECR/MGS	-----				2268	2.40
ECR/ GMO	0		3488	1.23	22374	0.96
ER/ASN	4248	1.46	3330	1.45	5886	1.60
ER/HWH					6444	3.60
NCR/CNB	0		0		18000	2.50
NCR/JHS	21924	2.00	16704	2.05	15480	2.00
NR/LDH	2000		17712	---	7992	2.83
NR/GZB	0		324	1.15	3564	1.83
NR/KJGY	-----				1296	3.00
SCR/KZJ	7956	1.588	11070	2.18	13896	2.19
SCR/BZA	5320	2.2	15287	2.27	18324	2.24
SCR/LGD	2016	1.81	4180	1.80	4320	1.77
SECR/BIA	8343	1.27	12258	1.27	11394	1.86
SER/SRC			0		15818	-----
SER/BNDM	6208	1.5	2052	---	3024	1.90
SER/TATA	756	1.45	0			
SR/AJJ	5286	2.18	2444	2.22	2813	2.06
SR/ED	56688	2.46	3582	1.45	9792	1.62
SR/RPM	711	1.69	864	-----	5400	1.81
WCR/ET	3000	3.50	1000	3.50	500	3.00
WCR/NKJ	12539	3.00	7128	3.00	3222	3.54
WCR/TKD	1044	2.02	1602	2.02	108	----
WR/BRC	13080	3.9	7992	1.70	8946	1.70
WR/BL	12082	3	14346	4.00	11264	4.00
Total	180026	2.52	140397	2.11	201286	2.06

(P- Population, WR- Wear Rate in mm/10,000 KM)

b. Wear rate of EG 9049 grade

Rly/Shed	2015-2016		2016-17		2017-18	
	P	WR	P	WR	P	WR
CR/BSL	220	1.50	1260	1.70	0	
CR/KYN	1008	2.1	1008	2.10	0	
CR/AQ	1755	1.79	324	1.23	0	
ECOR/ANGL	0		0		6	----
ECOR/VSKP					180	1.39
ECR/MGS					648	2.30
ECR/ GMO	6300	1.12	2596	1.18	0	
ER/ASN	4860	2.16	4788	1.72	2034	1.91
ER/HWH			0		0	
NCR/CNB	0		0		864	2.50

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NCR/JHS	396	1.95	504	1.80	1062	1.84
NR/LDH	12500	2.65	0		0	
NR/KJGY					0	
NR/GZB	4790	1.84	2474	1.80	0	
SCR/KZJ	7396	1.34	4351	1.34	2322	1.64
SCR/BZA	950	2.38	108	1.76	0	
SCR/LGD	1381	1.88	270	1.88	0	
SECR/BIA	1476	1.28	90	1.29	36	1.86
SER/SRC			----		0	
SER/TATA	648	1.43	-----		-----	
SER/BNDM	3282	----	1620	----	0	
SR/AJJ	8280	1.86	5229	2.22	392	2.30
SR/ED	28198	2.17	180	1.08	54	0.61
SR/RPM	2196	1.34	0		0	
WCR/ET	600	3.50	0		0	
WCR/NKJ	4548	4.50	234	2.00	0	
WCR/TKD	2052	-----	0		0	
WR/BRC	1482	2.70	0		0	
WR/BL	4032	3.00	3420	3.00	4024	3.00
Total	96298	2.02	28456	1.77	11622	2.11

(P- Population, WR- Wear Rate in mm/10,000 KM

c. Wear rate of EG 8220 grade

Rly/Shed	2014-2015		2015-16		2016-17	
	P	WR	P	WR	P	WR
CR/BSL	694	1.24	2578	1.32	2542	1.80
CR/KYN	4446	2.50	4446	2.20	11700	2.45
CR/AQ	243	0.53	621	1.42	1431	1.66
ECoR/ANGL	13608	2.75	16200	2.75	498	----
ECoR/VSKP					1926	1.28
ECR/MGS					342	2.50
ECR/ GMO	288	1.20	180	0.99	2682	1.05
ER/ASN	2016	1.47	2682	1.91	2880	1.60
ER/HWH					3384	3.40
NCR/CNB	21924	2.30	21924	2.50	1000	3.00
NCR/JHS	36	1.90	5148	1.8	5814	2.45
NR/LDH	7640	1.95	198	----	9720	2.05
NR/KJGY					1080	2.50
NR/GZB	4790	1.84	1198	1.73	108	1.59
SCR/KZJ	1820	1.30	1859	1.92	1872	2.04
SCR/BZA	10980	1.92	2498	1.72	1224	1.96
SCR/LGD	1408	1.59	288	1.98	0	
SECR/BIA	2925	1.27	396	1.29	1314	1.87
SER/SRC					2704	----
SER/BNDM	11560	2.50	19008	2.5	17064	2.90
SER/TATA	7776	1.48	7020	1.48	-----	
SR/AJJ	18	1.86	7097	2.29	12267	1.97

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SR/ED	27182	2.17	21366	1.57	11988	1.09
SR/RPM	552	1.34	2007		3888	1.44
WCR/ET	5000	3.50	7100	3.50	7600	3.00
WCR/NKJ	3217	3.00	12942	3.00	17082	3.29
WCR/TKD	0		1530	2.20	3132	1.72
WR/BRC	5478	5.30	3942	1.4	3348	
WR/BL	950	3.00	702	3.00	804	3.00
Total	134551	2.34	137845	2.09	129394	2.26

(P- Population, WR- Wear Rate in mm/10,000 KM)

8. Comparative Performance of various grades is given below:

a. FRPCPY wise

Grade	Year : 2015-2016			Year: 2016-17			Year : 2017-18		
	P	F	%F	P	F	%F	P	F	%F
EG105(S)	180026	1428	0.79	140397	826	0.60	201286	4944	2.46
EG9049	96298	468	0.49	28456	6	0.02	11622	8	0.09
EG8220	134551	7753	5.76	164930	12806	7.93	129394	2974	2.45
Total	410875	9649	2.34	333783	13638	4.08	342302	7926	2.31

(P- Population, F- Numbers of failures, %F- FRPCPY)

b. Yearly FRPCPY for carbon brush is given below:

Year	Population	Failures	FRPCPY
2015-16	410875	9649	2.34
2016-17	333783	13638	4.08
2017-18	342302	7926	2.32
Total	1086960	31213	2.87

c. Wear rate wise

Grade	2015-2016		2016-17		2017-18	
	Population	WR	Population	WR	Population	WR
EG105(S)	180026	2.52	140397	2.11	201286	2.06
EG9049	96298	2.02	28456	1.77	11622	2.11
EG8220	134551	2.34	164930	2.09	129394	2.26
Total	410875	2.34	333783	2.07	342302	2.14

(WR- Wear Rate in mm/10,000 KM)

9. It is observed that failure rate of EG105(S) grade in 2017-18 had increased from 2016-17 and performance had deteriorated. Failure rate of EG8220 grade in 2017-18 had reduced from 2016-17 and performance had improved. Performance of EG9049 grade is better than the EG105(S) & EG8220 grades.

10. It is observed that performance of EG9049 grade is better than the other grades in 2015-16 & 2016-17 in terms of failure rate as well as wear rate. In 2017-18, average wear rate of EG105(S) is least amongst all three grades.

11. Some of the Sheds which had reported higher & lower than the average FRPCPY for EG105(S) & EG8220 grades are given below:

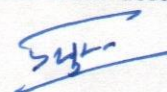
For EG105(S)

SHED	Population	Failures	FRPCPY
ELS/KYN	720	223	30.97
ELS/SRC	15818	3042	19.23
ELS/AJJ	2813	294	10.45
ELS/BRC	8946	303	3.38
ELS/CNB	18000	0	0.00
ELS/BIA	11394	0	0.00
ELS/JHS	15480	3	0.01
ELS/BL	11264	5	0.04

For EG8220

SHED	Population	Failures	FRPCPY
ELS/AJJ	12267	960	7.82
ELS/KYN	11700	866	7.40
ELS/ET	7600	199	2.61
ELS/BRC	3348	0	0.00
ELS/ASN	2880	0	0.00
ELS/SRC	2704	0	0.00
ELS/BNDM	17064	40	0.23
ELS/LDH	9720	84	0.85

12. From the above, it is observed that, for same grade, there is wide variation in performance amongst shades also. All the shades were requested to study and follow the good practices adopted by the sheds which have least failures.
13. For EG8220 grade of M/s Mersen, large number of failures had been reported by ELS/AJJ, KYN, NKJ, ET & ED. ELS/ET had informed that there are failures of uprooting of pigtail inspite of using blue sleeveby M/s Mersen. ELS/NKJ had reported many cases of chipping & uprooting mainly in 2/17 & 5/17 batch of carbon brushes. M/s Mersen is advised to visit all these sheds for inspection and investigation of the failed carbon brushes and submit a comprehensive report incorporating the root cause of failures as well as action plan to improve the reliability within two months to RDSO.
14. For EG105(S) grade of M/s ACPL, large number of failures had been reported by ELS/SRC, KYN, AJJ, ED, BRC, RPM & NKJ. Failures had been reported mainly in 2/16, 3/16, 5/17, 6/17 batches of carbon brushes. M/s ACPL is advised to visit all these sheds for inspection and investigation of the failed carbon brushes and submit a comprehensive report incorporating the root cause of failures as well as action plan to improve the reliability within two months to RDSO.
15. M/s ACPL had informed during meeting that some of the defective lots (Lot no 03/14, 02/16 & 05/17) had manufacturing problems. During manufacturing process, the blocks came under direct touch of furnace flame and become soft. Now firm had changed the saggars and following action have been taken to ensure quality:
- (i) Checking of Hardness & Transverse Strength of each batch material before taking into production.
 - (ii) All Hitachi blocks are kept in center of the Graphitization furnace surrounded by other EG grade materials to avoid the any burning of the block.
 - (iii) All the Saggars used for Hitachi block sintering are new and free from defects like hair line cracks, edge breakages etc.



ACPL had already replaced brushes of defective lots as per details under:

SN	CONSIGNEE	Defective Batches	Nature of Defects	Qty. Replaced
1.	ELS/BRC	03/14	Breakage, Chipping & Fast wear	216
2.	ELS/BSL	02/16, 05/17	Chipping & Fast wear	1407
3.	ELS/KYN	01/14, 10/14, 01/15, 02/15, 06/15, 02/16, 03/16	Breakage, Chipping	668
			Total	2291

- 15 In view of large numbers of failures of Grades EG-8220 and EG-105S in 2017-18, both firm are requested to narrow their range of declared properties so that better quality of carbon brushes can be obtained.

- 16 In recent past, failures had been observed in following Lot numbers of carbon brushes:

Grade	Defects found in Lot Numbers	Effected Sheds
EG 105S	1/16, 2/16, 3/16, 4/16, 6/16, 7/16, 10/16, 1/17, 5/17, 6/17, 10/17, 11/17, B-28, 19, 30, 26, 16	ELS/BZA, LDH, BRC, BSL, KYN, NKJ, VSKP, HWH etc.
EG 9049	04/17	ELS/MGS
EG 8220	10/14, 2/15, 3/15, 4/15, 7/15, 9/15, 10/15, 12/15, 1/16, 02/16 9/16, 11/16, 2/17, 5/17, 6/17, 7/17	ELS/BZA, BSL, KYN, AQ, ET, TKD, NKJ, JHS, VSKP, HWH etc

Railways are advised to monitor the performance of carbon brushes of above lots and advise performance to RDSO. M/s Mersen and M/s ACPL are advised to submit detailed investigation reports of above lots to RDSO.

17 Pending Warranty Replacement:

M/s Mersen had informed that it had replaced about 24000 brushes in 2017-18, as per firm 250 number s brushes are pending for ET shed and 930 numbers are pending for BSL shed.

M/s ACPL informed during meeting that they have replaced all brushes under warranty as per complaint received during 2017-18. Firm has nil pending warranty replacement for year 2017-18.

M/s Mersen is advised to expedite and complete the pending warranty replacements within two months.

- 18 M/s ACPL had given a presentation during meeting on the effects of ovality in the commutator on the performance of carbon brushes and suggested use of commutators profiler by the sheds.

- 19 Hitachi Maintenance Manual prescribes following limits for the commutators:

Item	Corrective Limits	After turning
Eccentricity	Not more than 0.1 mm	0.03 mm
Inequality in Diameter	Not more than 0.05 mm	0.005 mm
High-bar ,Low-bar	Not more than 0.005 mm	0

For measurement of High-bar, Low-bar (very important factor causing high brush wear) sheds are required to use commutator profiler.

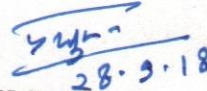
20 Some of the sheds already using commutator profiler for measurements and maintenance of commutators. Sheds using commutator profiler are requested to give a report on usefulness of commutator profiler on maintenance of commutator.

21 Sheds were requested to monitor the performance of carbon brushes Loco type wise also.

22 **Testing of carbon brushes:**

TC - 0147 (Rev '0') dated 29.05.2018, issued for Testing of Carbon brush Block properties from finished carbon brush of Hitachi HS 15250A Traction motors.

Sheds can also get defective lots tested as per the technical circular.


(P.K.Saraswat)
for Director General/Elect.

List of Participants

Annexure - I

SN	Name (S/Shri)	Designation	Railway
1.	P.K. Saraswat	DSE (TM)	RDSO
2.	SenthamilSelvan	Sr. DEE/TRS/AJJ	SR
3.	A.MadusudanSagar	Sr. DEE/TRS/BZA	SCR
4.	R.R. Lazarus	Sr. DEE/ETC/CNB	NCR
5.	RachitKhanna	DEE/TRS/LDH	NR
6.	Nikhil Singh	DEE/TRS/BSL	CR
7.	Ravi Yadav	AEE/TMM/CLW	CLW
8.	Mohd. Azeem	SSE/Electrical	RDSO
9.	Pradeep Kumar Gupta	SEE/ELS/BRC	WR
10.	Ambuj Sharma	SEE/ELS/CNB	NCR
11.	Dhananjay Kumar	SEE/ELS/BSL	CR
12.	S.S. Srivastava	SSE/TRS/BL	WR
13.	Ram Avtar Pal	SSE/ELS/ET	WCR
14.	M.K. Singh	SSE/ELS/MGS	ECR
15.	MadhurPandey	SEE/ELS/JHS	NCR
16.	J. Kishore	JE/ELS/BZA	SCR
17.	Mithilesh K. Chaudhry	SSE/ELS/AJJ	SR
18.	Ashwani Kumar	SSE/ELS/LDH	NR
19.	Pankaj Kumar	SSE/TMD/CLW	CLW
20.	Shishir Kumar	SSE/ELS/NKJ	WCR
21.	SushilShukla	Tech./TRS/BL	WR
22.	D. Basak	GM, Sales	M/s Mersen
23.	RakeshSarkar	Manager East	M/s Mersen
24.	B.SanGappa	Service Engineer	M/s ACPL
25.	ShantanuSengupta	Head North Zone	M/s ACPL

