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Research Designs & Standards Organisation
Lucknow - 226 011
DID (0522) 2456115
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No. EL/4.2.15/Gen

Dated 07.08.2019

प्रमुख विद्युत अभियंता,

1. मध्य रेलवे, मुम्बई सीएसटी 400 001
2. पूर्व मध्य रेलवे, हाजीपुर–844 101
3. पूर्व तटीय रेलवे, चन्द्रषेखरपुर, भुबनेश्वर–751 023
4. पूर्व रेलवे, फेयर्ली प्लेस, कोलकाता–700 001
5. उत्तर मध्य रेलवे, ब्लाक ए 2, सुबेदारगंज इलाहाबाद–211 033
6. उत्तर रेलवे, बडौदा हाऊस, नई दिल्ली–110 001
7. उत्तर पश्चिम रेलवे जयपुर–302006
8. उत्तर पूर्व रेलवे गोरखपुर–273001
9. उत्तर पूर्व फ्रेन्टीयर रेलवे मालीगॉव गुवाहाटी–781011
10. दक्षिण मध्य रेलवे, रेल निलायम, सिकंदराबाद–500 371
11. दक्षिण पूर्व मध्य रेलवे, बिलासपुर– 495 004
12. दक्षिणपूर्वरेलवे, गार्डेनरीच, कोलकाता–700 043
13. दक्षिण रेलवे, पार्क टाउन, चेन्नई–600 003
14. दक्षिण पश्चिम रेलवे हुबली–580020
15. पश्चिम मध्य रेलवे, जबलपुर–482 001
16. पश्चिम रेलवे, चर्चगेट, मुम्बई– 400 020
17. चित्तरंजन रेल इंजन कारखानी, चित्तरंजन– 713 331
18. डीजलरेलइंजनकारखानी, वाराणसी–221004

Principal Chief Electrical Engineers,

1. Central Railway, Mumbai, CST-400 001.
2. East Central Railway, Hazipur-844 101.
3. East Coast Railway, Chandrashekharpur, Bhubaneshwar-751 016.
4. Eastern Railway, Fairlie Place, Calcutta-700 001.
5. North Central Railway, Block-A, Subedarganj, Allahabad-211 033.
6. Northern Railway, Baroda House, New Delhi-110 001.
7. North Western Railway, Jaipur-302 006
8. North Eastern Railway, Gorakhpur-273001
9. North East Frontier Railway, Maligaon, Guwahati-781011
10. South Central Railway, Secunderabad-500 071.
11. South East Central Railway, Bilaspur-495 004.
12. South Eastern Railway, Garden Reach, Kolkata-700 043.
13. Southern Railway, Park Town, Chennai-600 003.
14. South Western Railway, Hubli-580020
15. West Central Railway, Jabalpur-482 001.
16. Western Railway, Churchgate, Mumbai-400 020
17. Chittaranjan Locomotive Works, Chittaranjan-713 331
18. Diesel Locomotive Works, Varanasi-221 004.

Sub: Minutes of Performance Review Meeting of Microprocessor based control and fault diagnostic system (MPCS) held at RDSO on 19.07.2019.

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The minutes of performance review meeting of Microprocessor based control and fault diagnostic system (MPCS) held at RDSO on 19.07.2019 had been issued and may be downloaded from RDSO website using following path:

http://www.rdso.indianrailways.gov.in→ Directorates → Electric Loco → Reliability meetings →MPCS →EL/4.2.15/Gen dated 07.08.2019.

This is for your kind information please.

7.8.19

(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 Medha Servo Drive Pvt. Ltd, Hyderabad.
   - for information and necessary action please.

7.8.19

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

Encl: As above

Minutes of Performance Review Meeting of Microprocessor based control and fault diagnostic system (MPCS) held RDSO on 19.07.2019.

Present: As per list enclosed as Annexure - I.

1. At the outset, DSE/TM welcomed all the participants of the meeting and expressed concern about high rate of failures of MPCS. MPCS manufacturers were advised to take necessary action to improve the reliability.
2. Firm wise analysis of failures and progress of implementation of modifications were discussed during the meeting.
3. **Punctuality cases:**

   Punctuality cases on MPCS account featuring in elocos website were discussed during meeting. There were total 77 punctuality cases in 2018-19 on MPCS account, out of which 64 cases were due to MPCS failure and remaining 13 cases were transient/found normal/external. Component wise analysis of punctuality cases is given below:

Firm	MPCS failures			
	2016-17	2017-18	2018-19	2019-20 (upto 1Q)
Medha	**18**	**18**	**38**	**14**
Stesalit	**20**	**27**	**26**	**3**
ICECPL	**10**	**13**	**10**	**2**
SIL	**4**	**3**	**3**	-
Total	**52**	**61**	**77**	**19**

(a) Component wise analysis of punctuality cases of 2019-20 (upto Jun 19)

Items	ICECPL	SIL	Medha	Stesalit	Total
Filter card			1		1
CPU card	1				1
Input card	1		4	2	7
Output card			1		1
ISCU			1		1
SCU			6		6
Software			1 (VCD V3)	1	2
Grand Total	**2**		**14**	**3**	**19**

(b) Component wise analysis of punctuality cases of 2018-19

Items	ICECPL	Medha	Stesalit	SIL	Total
Analog card		3	1		4
CPU	1	1	3	1(V3)	6
Input card	2	6+2(V3)			10
Mother Board	1	7	5		13
IF or MF Card		2			2

Items	ICECPL	Medha	Stesalit	SIL	Total
PS Card		1(V3)			1
Output card	1	3+1(V3)	8	1	14
PT	2		2		4
SCU	3	3	1	1	8
ISCU		1			1
Cable out from lug			1		1
Normal found (NF)		2	4		6
Misc		5	1		6
External		1			1
Grand Total	**10**	**38**	**26**	**3**	**77**

4. Performance and failure analysis of MPCS V2

a. Population of MPCS V2 of various makes, their failures and FRPCPY is given below:

Firms	2016-17			2017-18			2018-19		
	Pop.	Fail.	F%/Y	Pop.	Fail.	F%/Y	Pop.	Fail.	F%/Y
Medha	1117	172	15.39	1126	197	17.50	1154	201	17.41
Stesalit	668	382	57.18	654	303	46.33	565	287	50.79
ICECPL	97	126	129.89	93	110	118.28	74	104	136.48
SIL	73	31	42.46	71	23	32.39	56	12	21.42
Laxven	4	2	50.00	4	1	25.00	3	3	100.00
Transtel	2	1	50.00	2	1	50.00	2	1	50.00
Total	**1961**	**714**	**36.40**	**1950**	**635**	**32.56**	**1854**	**608**	**32.79**

(Note:- P= MPCS Loco Population, F= Failures & F%/Y= FRPCPY)

b. Warranty Failure Status of MPCS V2 in **2018-19** is given below:

Warranty Status	ICECPL	Laxven	Medha	SIL	Stesalit	Transtel	Grand Total
Within	7 (6%)	0	15 (3%)	0	0	0	**22 (1%)**
Out of	97 (94%)	3 (100%)	186 (97%)	12 (100%)	287 (100%)	1 (100%)	**586 (99%)**
Total	**104**	**3**	**201**	**12**	**80**	**0**	**608**

c. Type wise failure analysis of MPCS V2 in **2018-19** is given below:

Type of Failure	ICECPL	Laxven	Medha	SIL	Stesalit	Transtel	Grand Total
Line	54	2	88	7	128		**279**
Others	42	1	94	5	140	1	**283**
Punctuality	8		19		19		**46**
Total	**104**	**3**	**201**	**12**	**287**	**1**	**608**

Shed wise and make wise FRPCPY of MPCS V2 for year 2018-19

Railways	Sheds	Medha			Setsalit			ICECPL			SIL			Others			Grand Total of Railway		
		P	F	%F	P	F	%F	P	F	%F	P	F	%F	P	F	%F	P	F	%F
NCR	CNB	30	4	13.3	21	26	123.8	5	27	540.0	2	1	50.0				58	58	100.0
NR	GZB	13	8	61.5				1	3	300.0							14	11	78.6
SER	BKSC	49	10	20.4	36	16	44.4	20	36	180.0	4	1	25.0				109	63	57.8
WCR	TKD	7	1	14.3	8	7	87.5										15	8	53.3
SER	BNDM	36	12	33.3	22	15	68.2										58	27	46.6
SECR	BIA	41	8	19.5	54	35	64.8										95	43	45.3
SR	AJJ	68	25	36.8		2	0.0		1	0.0							68	29	42.6
SCR	BZA	97	18	18.6	77	42	54.5	6	8	133.3	5	4	80.0	1T	1T	100.0	186	73	39.2
NCR	JHS	58	12	20.7	36	13	36.1	4	8	200.0	2	1	50.0				100	34	34.0
WCR	NKJ	42	7	16.7	25	14	56.0				4	1	25.0				71	22	31.0
ER	ASN	28	5	17.9	52	21	40.4	2	0	0.0	2	0	0.0				84	26	31.0
NR	LDH	68	12	17.6	35	18	51.4	2	2	100.0							105	32	30.5
ECoR	VSKP	29	7	24.1	2	2	100.0										31	9	29.0
WR	BL	62	14	22.6	10	5	50.0	7	7	100.0	19	2	10.5				98	28	28.6
ER	HWH	10	3	30.0	10	2	20.0										20	5	25.0
SCR	LGD	4	1	25.0													4	1	25.0
WCR	ET	75	12	16.0	38	16	42.1				2	0	0.0				115	28	24.3
SCR	KZJ	66	6	9.1	19	13	68.4	5	1	20.0				3L	3L	66.7	93	22	23.7
ECR	MGS	53	3	5.7	38	17	44.7	2	2	100.0	5	1	20.0				98	23	23.5
SR	ED	46	11	23.9	5	1	20.0	1	0	0.0	1	0	0.0				53	12	22.6
ECoR	ANGL	73	7	9.6	39	16	41.0	13	6	46.2	4	0	0.0	1T	0		130	29	22.3
SER	SRC	30	5	16.7	1	1	100.0										31	6	19.4
ECR	GMO	2	2	100.0	10	0	0.0										12	2	16.7
NR	SRE	28	3	10.7	10	1	10.0	3	3	100.0	1	0	0.0				42	7	16.7
CR	KYN	6	1	16.7	4	0	0.0				4	1	25.0				14	2	14.3
CR	BSL	82	4	4.9	1	2	200.0										83	6	7.2
SER	TATA	10	0	0.0	6	1	16.7										16	1	6.3
WR	BRC	23	0	0.0	6	1	16.7				1	0	0.0				30	1	3.3
SR	ED D	18	0	0.0				3	0	0.0							21	0	0.0
	Total	1154	201	17.4	565	287	50.8	74	104	140.5	56	12	21.4	5	4	80.0	1854	608	32.8

Note: for others population L=Laxven make and T= Transtel make

5. Performance and failure analysis of MPCS V3

a. Population of MPCS V3 of various makes, their failures and FRPCPY is given below:

2018-19			
Firm	**P**	**F**	**F%**
Medha	248	33	**13.30**
ICECPL	6	23	**383.33**
SIL	5	3	**60.00**
Total	**259**	**59**	**22.78**

	2015-16			2016-17			2017-18		
Firm	**P**	**F**	**F%**	**P**	**F**	**F%**	**P**	**F**	**F%**
Medha	58	2	**3.45**	83	16	**19.27**	86	9	**10.47**
ICECPL	7	27	**385.71**	5	15	**300.00**	7	20	**285.71**
SIL	2	0	**Nil**	6	8	**133.33**	7	11	**157.14**
Total	**67**	**29**	**43.28**	**94**	**39**	**41.48**	**100**	**40**	**40.00**

Note:- P= MPCS Loco Population, F= Failures & F%= FRPCPY

b. Warranty Failure Status 2018-19 of MPCS V3

All MPCS V3 failures were under warranty.

c. Type failure wise analysis of MPCS V3 2018-19 is given below:

Warranty Status	**ICECPL**	**Medha**	**SIL**	**Grand Total**
Punctuality		2	1	**3**
Line	11	18	1	**30**
Others	12	13	1	**26**
Total	**23**	**33**	**3**	**59**

d. Shed wise FRPCPY of MPCS V3 for 2018-19

Shed	**Medha**			**ICECPL**			**SIL**			**Grand Total**		
	P	**F**	**%F**	**P**	**F**	**%F**	**P**	**F**	**%F**	**P**	**F**	**%F**
GZB	6	2	33.33	1	10	1000.0	0	0		7	12	171.43
ANGL	9	1	11.11	2	7	350.00		0		11	8	72.73
BL	19	10	52.63		0			0		19	10	52.63
BKSC	6	1	16.67	0	0		1	1	100.00	7	2	28.57
MGS	21	3	14.29	2	2	100.00	2	2	100.00	25	7	28.00
KYN	4	1	25.00		0			0		4	1	25.00
NKJ	20	2	10.00	1	3	300.00	0	0		21	5	23.81
TATA	9	2	22.22		0			0		9	2	22.22

Shed	Medha			ICECPL			SIL			Grand Total		
	P	F	%F	P	F	%F	P	F	%F	P	F	%F
GMO	5	1	20.00		0			0		5	1	20.00
CNB	6	0	0.00		1			0		6	1	16.67
JHS	14	2	14.29		0			0		14	2	14.29
BNDM	8	1	12.50		0			0		8	1	12.50
BRC	8	1	12.50		0			0		8	1	12.50
HWH	19	2	10.53		0			0		19	2	10.53
KZJ	12	1	8.33		0			0		12	1	8.33
AJJ	12	1	8.33	0	0		0	0		12	1	8.33
BSL	16	1	6.25		0			0		16	1	6.25
SRC	16	1	6.25		0			0		16	1	6.25
VSKP	2	0	0.00		0			0		2	0	0.00
LDH	1	0	0.00	0	0		0	0		1	0	0.00
SRE	2	0	0.00	0	0		0	0		2	0	0.00
BZA	5	0	0.00		0			0		5	0	0.00
ED	15	0	0.00	0	0		0	0		15	0	0.00
ED D	3	0	0.00	0	0		0	0		3	0	0.00
ET	7	0	0.00	0	0		2	0	0.00	9	0	0.00
TKD	3	0	0.00	0	0		0	0		3	0	0.00
Total	**248**	**33**	**13.31**	**6**	**23**	**383.33**	**5**	**3**	**60.00**	**259**	**59**	**22.78**

6. Performance of M/s Stone India Limited (SIL):

a. M/s SIL make MPCS V2 had contributed total 12 failures out of 608 on MPCS V2 account. FRPCPY of M/s SIL for MPCS V2 is 21.42% in 2018-19.

b. M/s SIL make MPCS V3 had contributed total 3 failures out of 59 on MPCS V3 account. FRPCPY of M/s SIL for MPCS V3 is 60.0% in 2018-19.

c. Details of component wise failures of MPCS V2 are as under:

Faulty Item	2015-16	2016-17	2017-18	2018-19
CPU card	3	5		2
Display unit	1	4		
Filter card	2	3	3	
Input card	4	2	3	1
ISCU	6	3	1	3
Main unit			2	
Output card	2	--	4	1
SCU	3	11	6	2
Software	4	2	1	
Calibration	3	--		
Misc		1	3	3
Grand Total	**28**	**31**	**23**	12
Population	**75**	**73**	**71**	**56**

d. Details of Item wise failures of MPCS V3 are as under:

Faulty Item	2015-16	2016-17	2017-18	2018-19
CPU card		2	2	1
Display unit		3	3	
SCU		1		
Output card			1	
PS card				1
Mother Board				1
Misc			1	
Software		2	4	
Grand Total	**0**	**8**	**11**	**3**
Population	**2**	**6**	**7**	**5**

e. **Deliberations during meeting:**

S. N.	Item discussed
1.	M/s SIL had not attended the meeting.
2.	Failures in MPCS V2 are mainly due to ISCU, SCU & CPU card.
3.	Failures in MPCS V3 are due to CPU card, mother board & PS Card.
4.	CLW is requested to develop sources for repair of MPCS.

7. **Performance of M/s Stesalit:**

a. Highest number of failures of MPCS V2 are due to failures of M/s Stesalit make MPCS. M/s Stesalit make MPCS had contributed total 287 failures out of 608 on MPCS V2 account. FRPCPY of M/s Stesalit for MPCS V2 is 50.79% in 2018-19.

b. Details of Item wise failures of M/s Stesalit MPCS V2 are given below:

Faulty Item	2015-16	2016-17	2017-18	2018-19
Analog card	16	22	16	7
Coupler	1		1	1
CPU card	43	51	33	**26**
Display unit	32	14	15	16
IF or MFC card	20	6	4	4
Filter card	3	2	5	
Input card	26	31	21	**21**
ISCU	14	4	15	13
Main unit	7	6	2	2
Mother board	11	14	9	15
Output card	158	166	118	**123**
Power supply	3	1		1
PT	12	12	13	12
SCU	13	23	17	14

Faulty Item	2015-16	2016-17	2017-18	2018-19
Calibration	4			
Software	5	1	3	6
External	3	3	4	6
Misc	4	19		15
Transient	10			
Found normal	6	7	6	5
Grand Total	**391**	**382**	**303**	**287**
Population	**693**	**668**	**654**	**565**

S. N.	Item discussed
1.	M/s Stesalit had not attended the meeting.
2.	Failures in MPCS V2 are mainly due to Output card, CPU card, Input card, Display unit, Mother board, SCU, ISCU, PT.
3.	CLW is requested to develop sources for repair of M/s Stesalit make MPCS.

8. Performance of M/s ICECPL:

a. M/s ICECPL make MPCS V2 had contributed total 104 failures out of 608 on MPCS V2 account. FRPCPY of M/s ICECPL for MPCS V2 is 136.48% in 2018-19 which is highest amongst all makes.

b. M/s ICECPL make MPCS V3 had contributed total 23 failures out of 59 on MPCS V3 account. FRPCPY of M/s ICECPL for MPCS V3 is 383.33% in 2018-19 which is highest amongst all makes.

c. Details of Item wise failures of MPCS V2 are as under:

Faulty Item	2015-16	2016-17	2017-18	2018-19
Analog Card				1
Coupler	1	2		
CPU card	11	6	9	4
Display unit	1	2	2	3
Filter card		1		
Input card	17	19	25	**11**
ISCU	13	12	7	9
Main unit		5	1	5
Mother board	8	7	5	2
Output card	17	26	24	**17**
Power supply	1			2
PT	12	8	6	**13**
SCU	24	20	12	**23**
Calibration	1			
Software	1	4	4	1
External	1	2		1

Faulty Item	2015-16	2016-17	2017-18	2018-19
Maintenance	1			
Misc	2	8	14	12
Transient	3			
Found normal	8	4	1	
Grand Total	**122**	**126**	**110**	**104**
Population	**92**	**97**	**93**	**74**

d. Details of Item wise failures of MPCS V3 are as under:

Faulty Item	2015-16	2016-17	2017-18	2018-19
Display unit	11	2	6	2
Input card	3	4	5	
CPU	1	2		3
ISCU	3	1	2	9
Output card	2	2		1
PS card	1	2		2
SCU	1		1	3
Main unit			1	1
Mother Board		1	1	1
Misc.			2	
Software	2		1	
Cable				1
Coupler		1	1	
External	2			
Normal found	1			
Grand Total	**27**	**15**	**20**	**23**
Population	**8**	**5**	**7**	**6**

a. Deliberations during meeting:

S. N.	Item discussed
1.	M/s ICECPL had not attended the meeting.
2.	Performance of M/s ICECPL MPCS V2 is deteriorating. FRPCPY had increased from 118.28 % in 2017-18 to 136.48% in 2018-19. FRPCPY for MPCS V3 had increased from 285.71 % in 2017-18 to 383.33.3% in 2018-19. In MPCS V2; failures are mainly due to SCU, Output card, Input card & PT. In MPCS V3; failures are due to ISCU, SCU, CPU and Display unit.

9. Performance of M/s Medha:

a. M/s Medha make MPCS V2 had contributed total 201 failures out of 608 on MPCS V2 account. FRPCPY of M/s Medha for MPCS V2 is 17.41% in 2018-19 compared to 17.50 in 2017-18.

b. M/s Medha make MPCS V3 had contributed total 33 failures out of 59 on MPCS V3. FRPCPY of M/s Medha for MPCS V3 is 13.30% in 2018-19 compared to 10.47 in 2017-18.

c. Details of Item wise failures of MPCS V2 are as under:

Faulty Item	2015-16	2016-17	2017-18	2018-19
Analog card			1	2
Coupler	2			
CPU card	3	10	1	7
Display unit	5	5	6	5
IF or MFC card	5	9	7	10
Filter card	2	2	1	2
Input card	41	34	45	42
ISCU	13	5	15	11
Main unit	1	7	2	1
Mother board	27	38	25	35
Output card	25	25	38	36
Power supply		4	3	9
SCU	17	25	39	29
Cable				1
Software	3		2	2
External	1	1		1
Misc	2	2	10	5
Transient	1			
Found normal	1	5	2	3
Grand Total	**149**	**172**	**197**	**201**
Population	**1105**	**1117**	**1126**	**1154**

d. Details of Item wise failures of MPCS V3 are as under:

Faulty Item	2015-16	2016-17	2017-18	2018-19
Display unit		4	1	1
CPU card			2	2
IF or MFC			1	
PS card			1	
ISCU				1
SCU			2	4
Mother Board				1
Output card	1	2		16
Input card		1		1
REMAN		1		

Faulty Item	2015-16	2016-17	2017-18	2018-19
Software	1	2		2
Normal found		1		2
Misc		5	2	1
External				2
Grand Total	**2**	**16**	**9**	**33**
Population	**58**	**83**	**86**	**248**

e. Deliberation taken during meeting:

S. N.	Item discussed
1.	In MPCS V2; failures are mainly due to Input card, Output card, mother board, SCU & ISCU. In MPCS V3; failures are mainly due to output card & SCU. M/s Medha is advised to improve the reliability such that FRPCPY remains in single digit and make reliability action plan considering the failures and submit to RDSO within one month.
2.	M/s Medha had assured that further improvement in reliability will be visible in coming quarters.
3.	M/s Medha is advised to analyses failure data of 2018-19 and submit analysis report on annexure-II.
4.	M/s Medha had informed that mother board failures in MPCS V2 are due to opening of copper tracks close to mounting screws on motherboard due to environmental conditions/corrosion even though they are protected with conformal coating and this issue is taken care in newly designed mother boards by shifting tracks nearby to screws as far as possible. Total 521 mother Boards have been replaced during AMC. M/s Medha had informed that it had identified total 667 locomotives where mother board requires replacement. M/s Medha is requested to expedite the replacement of mother board so that failures can be reduced on mother board account. M/s Medha also requested to confirm that no failure is reported in newly designed mother boards.
5.	M/s Medha had earlier informed that failures of SCU in MPCS V2 are mainly due to opening of resistors due to high surges. To improve SCU reliability, M/s Medha had introduced Aluminium housed resistor instead of wire wound resistor with better surge and thermal characteristics and increased creepage distances for trial in 10 locomotives. Trial version of SCU had been provided in 4 locos of BZA & 6 locos of KZJ in the month of Jun & Jul 2018 for six months trial. During the meeting, it was informed that some of the

S. N.	Item discussed
	modified SCU had also failed in KZJ. M/s Medha is advised to analyse the failures of modified SCU and submit the failures investigation report and action plan to improve reliability of SCU.
6.	For input card failures in MPCS V2, M/s Medha had earlier informed in April 2016, that one input series resistance (12K, +/- 5% 6W wire wound type) was defective in particular batch (295 cards in 42 locomotives). M/s Medha had already carried out the modification in identified 42 locomotives by Feb 2017. However, large numbers of failures of input cards are still reported (41 in 2015-16, 34 in 2016-17, 45 in 2017-18 & 42 in 2018-19). M/s Medha had not given any root cause failure analysis for these cards and attributing them as stray cases. M/s Medha is advised to analyse these failures and incorporate in reliability action plan.
7.	Large numbers of failures of output cards of MPCS V2 are also reported (25 in 2015-16, 25 in 2016-17, 38 in 2017-18 & 36 in 2018-19). M/s Medha had not given any root cause failure analysis for these cards and attributing them as stray cases. M/s Medha is advised to analyse these failures and incorporate in reliability action plan.
8.	M/s Medha had earlier informed that failures of output cards of MPCS V3 are due to failure of one MOSFET driver IC of Vishay make. M/s Medha had identified suspected batch ICs and decided to change output cards (card SN 2517 to 2696) as an interim action to prevent further failures. M/s Medha informed during meeting that it had replaced 170 cards out of 180 cards identified and replacement of only 10 cards is pending in one loco each in NKJ & KJGY. M/s Medha to confirm whether all the 16 failures of 2018-19 are of identified batch or some other cards are also failing.
9.	M/s Medha is advised to expedite implementation of TC-119 (Rev. 1) for bilingual display of fault messages in all MPCS V3. M/s Medha had informed that it is implemented in 14 locos of MGS & 7 locos of JHS. M/s Medha is advised to implement it in all locomotives. M/s Medha is also advised to ensure that all the MPCS V3 under installation/to be installed shall be equipped with bilingual display feature.
10.	M/s Medha was earlier advised to expedite MPCS V3 MU/consist operation testing with serial

S. N.	Item discussed
	communication to establish the notch synchronization and examine the feasibility of communication through existing MU couplers. M/s Medha informed that they are still working on the issue. M/s Medha is advised to complete the testing before 30.9.2019.
11.	M/s Medha had informed that it had updated software of MPCS V3 to address the issues related to non-working of VCD bypass facility in LT test mode and VCD Test mode, non-recording of background data with fault message 'Notch not progressing due to RGAF'.
12.	M/s Medha is advised to submit all details of hardware & software modification/revisions number wise/year wise as per given format in annexure-3 within one month.
13.	M/s Medha is advised to submit current status of commissioning details of Locomotives fitted with MPCS version-2 & 3 within one month.
14.	M/s Medha is advised to submit root cause failure analysis of each quarter to RDSO before end of next quarter and submit analysis report as on Annexure-II.

10. All the sheds were requested to ensure compliance of following SMI/MS/TCs related to MPCS given below:

SN	SMI/MS/TC No.	Issue Date	Subject
1.	TC 119 amend 3	30.04.2019	Provision of VCD counter in MPCS V3 fitted locomotives.
2.	TC 150	14.03.2019	Proper connection of MU coupler in MPCS V3 locomotive to ensure proper working of vigilance control device (VCD)
3.	SMI 326	14.12.2018	Setting of pulse/revolution and wheel diameter with MPCS V3 for correct indication of speed.
4.	MS 442 Rev1	1.8.2018	GR-0 indication of middle & trailing locomotives through additional signalling lamps in leading locomotive in multiple/consist operation of two/three locomotives.
5.	TC 119 amend 2	28.1.2018	For setting of pulse/revolution and wheel diameter with MPCS V3 for correct indication of speed.
6.	TC 119 amend 1	25.08.2017	Implementing of Bilingual display of fault messages in MPCS V3language
7.	SMI 284	11.09.2015	Setting of Relay Q20 to reduce the traction motor flashing cases.

SN	SMI/MS/TC No.	Issue Date	Subject
8.	MS 431	05.02.2014	Modification in loco control circuit for working of VEAD valve in trailing locomotive during MU operation for 25 kv electric locomotive fitted with MPCS (ver-2).
9.	MS 430	21.01.2014	Modification in loco control circuit for connections for auto regression by pass (HPAR)switch in 25 kv ac electric tap changer locomotives working with MPCS V2.
10.	MS 421	25.10.2013	LSDBR lamp to avoid wrong indication of working of AC MVRF in MPCS fitted locomotives.
11.	MS 404	28.12.2011	Modification in control circuit fitted with MPCS for individual isolation of hard/soft QDs during operation of HMCS programme switch.

11. Planning of replacement of MPCS V2 by Zonal railways.

a. Codal life of MPCS is 12 years as per Railway Board's Letter no. 2002/AC-II/1/10 dated 24.05.2006.

b. RDSO is having commissioning details of MPCS V2 (up to 2016) is given below:

Comm. Year	Life in Years	Make				Total
		Medha	Stesalit	ICECPL	SIL	
2007	11	4	2	Nil	Nil	**6**
2008	10	30	27	Nil	Nil	**57**
2009	9	139	120	Nil	Nil	**259**
2010	8	265	92	Nil	13	**370**
2011	7	97	224	1	Nil	**322**
2012	6	166	142	9	12	**329**
2013	5	169	83	38	10	**300**
2014	4	137	Nil	37	17	**191**
2015	3	97	Nil	6	20	**123**
2016	2	13	Nil	6	1	**20**
2017	1	9	Nil	Nil	Nil	**9**
Total		**1126**	**690**	**97**	**73**	**1986**

c. From the above table, it is observed that replacement of about 300 MPCS per annum will be required for 2021 to 2025. Zonal Railways are requested to plan accordingly.

d. All the Zonal railways are requested to provide updated commissioning details of MPCS as per form given below:

Name of Railway ..... Name of Shed .....

S. N.	Loco no.	Loco type	MPCS Commissioning date	Make of MPCS	Version of MPCS

7.8.19

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

List of participants:-

SN	Name (S/Shri)	Designation	Railway
1	P. K. Saraswat	DSE/TM	RDSO
2	Rajesh Kumar	ADE/TM	RDSO
3	Ankit Singh	Dy CEE	NR
4	Chiyadri Vamsi	DEE/TRS/AJJ	SR
5	Arun Kumar	ADEE/NR	NR
6	Tanuj Kr. Sharma	AEE/TRS/BL	WR
7	Deepak Kumar	AEE/TRS/MGS	ECR
8	M. K. Singh	SSE/ELS/MGS	ECR
9	Amal Sebastian	AEE/ELS/ED	SR
10	K.M.Sumesh	SSE/ELS/ED	SR
11	Mithilesh Chaudhary	SSE/ELS/AJJ	SR
12	Sourabh Goswami	SEE/TRS/BSL	CR
13	Mohan Chaudhary	SSE/TRS/BSL	CR
14	S.R. Senapati	SEE/TRS/JHS	NCR
15	Ambuj Sharma	SSE/TRS/CNB	NCR
16	Pawan Kumar Giri	SEE/TRS/BL	WR
17	Saurabh Sinha	SSE/TRS/BRCY	WR
18	Somenath Das	SSE/TRS/HWH	ER
19	Ram Avtar Pal	SSE/TRS/ET	WCR
20	P.C. Sahu	SSE/TRS/NKJ	WCR
21	Vinay Kumar	SSE/TRS/ET	WCR
22	Somenath Banerjee	SSE/ELS/BNDM	SER
23	Atanu Karmakar	SSE/ELS/SRC	SER
24	Ashwani Kumar	SSE/TRS/LDH	NR
25	Amarnath M	SSE/ TRS/KZJ	SCR
31	S.K.Yadav	SSE/ELS/HWH	ER
32	A.N V. Rao		Medha Servo Drive
33.	V.K.L. Swamy		Medha Servo Drive

Name of the firm : Medha
Period :

(a) Failure summary

Railways	Shed	Population				No. of Failures				FRPCPY			
		under warranty	Under AMC	Not under Warranty/AMC	Total	under warranty	Under AMC	Not under Warranty/AMC	Total	under warranty	Under AMC	Not under Warranty/AMC	Total

(b) Item wise (example given)

Item	Sub item	No. of Failures
input card	Input card-2	
CPU	CPU-A	
ISCU	ISCU-1	

Details of modifications

(a) Hardware

Modification no.	Start Date	Item /Area	Problem reported	Proposed modification	Relevance of modification	For MPCS Version (V2/V3/Both)	Status of implementation	Remarks
M1								
M2								
....								

(b) Software

Release no.	Start Date	Item /Area	Problem reported	Proposed modification	Relevance of modification	For MPCS Version (V2/V3/Both)	Status of implementation	Remarks
R1								
R2								
....								

(c) Detailed shed wise implementation status of hardware modification

Railways	Shed	Population	Modification no. & date													
			M1		M2		M3		M4		M5		...		...	
			dd.mm.yy		dd.mm.yy		dd.mm.yy		dd.mm.yy		dd.mm.yy					
			Done	Bal	Done	Bal	Done	Bal	Done	Bal	Done	Bal				

(a) Detailed shed wise implementation status of software modification

Railways	Shed	Population	Software release no. & date													
			R1		R2		R3		R4		R5		...		...	
			dd.mm.yy		dd.mm.yy		dd.mm.yy		dd.mm.yy		dd.mm.yy					
			Done	Bal	Done	Bal	Done	Bal	Done	Bal	Done	Bal				