



CHALAK-PATRA

S-S-T-S

SEALDAH SUBURBAN TRACKING
SYSTEM
DEVELOPED BY OPERATION



CONTROL ROOM

JULY- DECEMBER 2019

SEALDAH

EASTERN RAILWAY



**CHALAK PATRA
MAGAZINE FOR CREW**

NAME OF CREW : _____

DESIGNATION : _____

H/QTR : _____

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**JULY- DECEMBER 2019
SEALDAH EASTERN RAILWAY**



MESSAGE

Revival of Chalak Patra is a good initiative taken by Sr.DEE/OP/SDAH. I hope the readers would have enjoyed its first edition. Although it's a quarterly magazine, a six monthly edition is being released owing to technical delays. This edition has covered many newly introduced technological devices like RTIS, SSTS, PIS, FOG PASS etc. to help our running staff to operate and use these new technologies with confidence so as to maximize their utility for the organization.

I do hope that you will find these articles interesting and useful. I request our readers to give feedback & suggestions to the editorial team by e-mail on chalak.patra@gmail.com

With best wishes

(VINEET GUPTA)
ADRM (OPERATION)
SEALDAH E.RLY



A STEP TO DEVELOP OUR KNOWLEDGE

Being in a technical job its necessary to freshen up our knowledge time to time and get familiarized with new technologies introduced for improved performance. Chalak Patra is a great medium to achieve our target of punctual running of trains without compromising safety. This edition of Chalak Patra covers wide range of interesting topics such as SSTs, RTIS, PUSH-PULL, FOG-PASS device etc., including trouble shooting and safety instructions. I'm sure all the running staffs will get benefited greatly from the topics selected by the team who have put up huge efforts to bring this edition in present form.

(KAMALESH SARKAR)

**ADEE/OP/SDAH
EASTERN RAILWAY**



EDITORIAL

Dear friend,

We hope you enjoyed the 'PUJA FESTIVAL' with your family in your little time. We know a pain always run on your heart to spend a lot of time with your dear all. But being a running staff your hope can't float on sky as like as clouds, you can't sing like a Bird taking their hand on your journey. Don't be worry; always think you are doing all to blossom smile on their lips and also you are a very important person to us because you are serving the Nation by your responsible Job. Hence we all are great- full to you for your self-abnegation (Aatmyatyag).

In this way you already introduced with our heart touching magazine "CHALAK PATRA". We hope that it always guide you like a friend on your journey. Looking with this view in this addition some new valuable interesting topics (SSTS/RTIS/FOG-PASS etc) are added by our respected Sr. DEE/OP/SDAH to increase punctuality of trains, in which some we can see at a glance by a Net-Link and you can be improve if you have any deficiency on your train operation.

Therefore, we are very hopeful in these modern technologies help us to remove our weakness by up-dating knowledge on train operation with the care of safety, security and looking the demand of punctuality. In this regards we are grateful to our SR.DEE/OP/SDAH, ADEE/OP, other all CORE GROUPs of conventional LOCO, 3-PH LOCO, Conventional EMU and 3-PH EMU, CCCR/SDAH, CCCR/DDJ, CLI/IT, CLI- H/QTR, CTLC & TI/SAFETY, they all helped us paying by their concentration & depth of love.

Suggestions and comments are always welcome for better progress of our Magazine from your end. No more to-day. Thanks to all.

Yours,

Core group Committee "CHALAK PATRA"
CLIs-Bhabatosh Bhowmik, Animesh Sarkar
Baidhar Singh & Jayanta Kundu

SEALDAH / EASTEN RAILWY

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2 SSTS (SEALDAH SUBURBAN TRACKING SYSTEM)

2.1 ABOUT THE SYSTEM [DEVELOPED BY ELC/OP/SDAH /E. RLY]

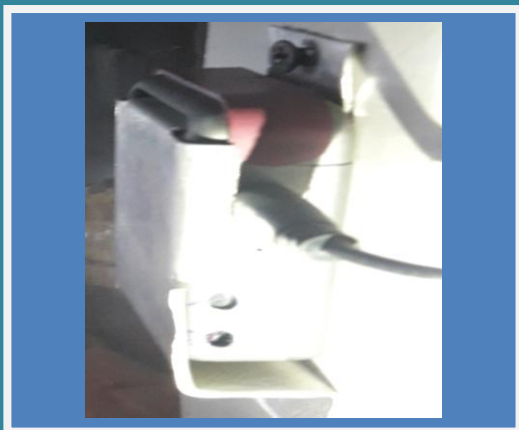
2.1.1 Description of the system:

'SEALDAH SUBURBAN TRACKING SYSTEM' is an innovative work developed by Electric Operation wing led by Sr. DEE/OP initiated in April 2019 as a part of the 'Mission 80' launched by Hon'ble DRM/SDAH in view of improvement of punctuality in SEALDAH division. At present, the system consists GPS and GSM based trackers installed in approx. 100 suburban rakes which provide time stamped speed and location data with a fine resolution of 3 seconds on real time basis. The complete software has been developed in house by Sri Dipankar Ray, CLI/SDAH and has been successfully launched in the division enabling real time tracking of trains by colour coded speed map over open street map, instantaneous generation of speed time chart, indicate late running of trains etc. The software also records/calculates some key parameters relevant for suburban services like max. Speed achieved between 2 sections, actual stoppages at scheduled halts (geo fences), Sectional as well as cumulative loss etc. Geographical mapping not only enables to observe the mid-section behaviour and to keep a watch on observation of speed relaxation/restriction being followed by crew but it also helps measure the distance covered under restricted speed by 2 level thresholding on map which is important from safety perspective. The software generates the key punctuality parameters on daily, monthly basis and is being linked to loco pilots' database for more analysis.

In near future, with accumulation of sufficient data, application of data science and neural networks (AI) will further help analysis and improve punctuality which is on the rise. Once 100% rakes are covered, it will enable announcement at flag and halt stations where communication does not exist otherwise.

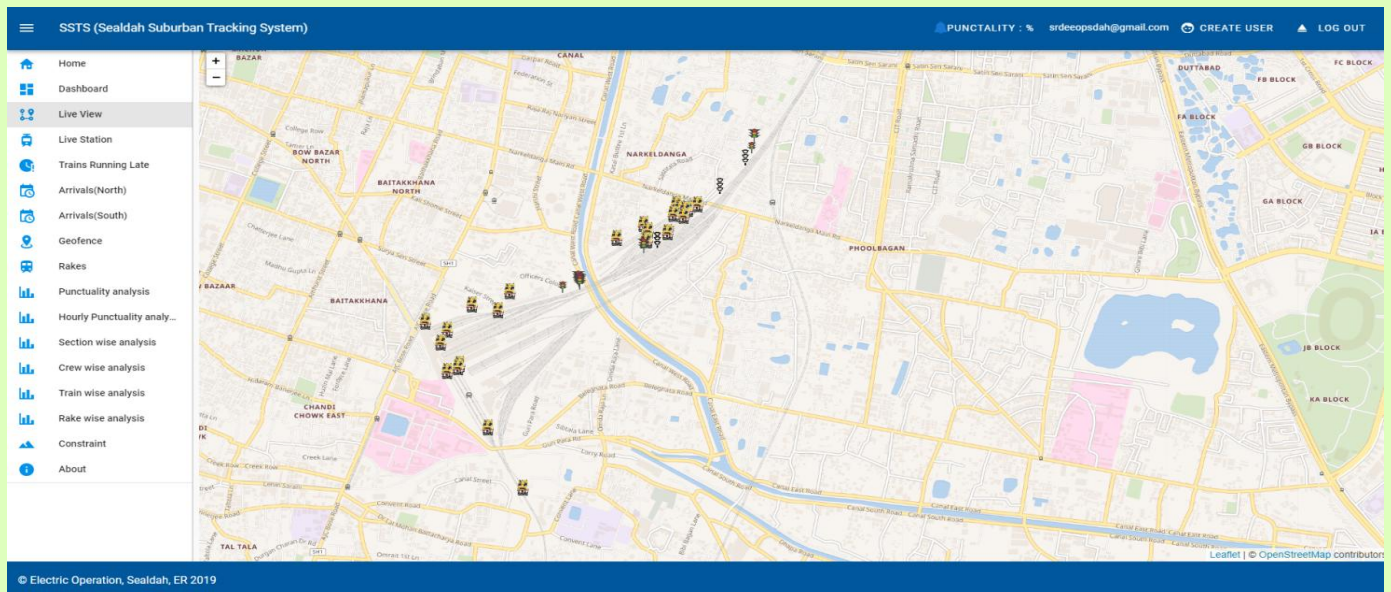
Mapping of tracks in future will extend this project to work as controller assistance. The server is accessible at <http://13.235.105.131:5000/>.

The present cost of work is around 4.5 lacs which are largely for the hardware, GPRS data and cloud server procurement. Being a data mining project, a large sum has been saved owing to in house software development with the help of open source tools only.



2.1.2 Advantages of SSTS:

1. Complete transparency of the train reporting system.
2. View real time location and movement of all the trains on the map.



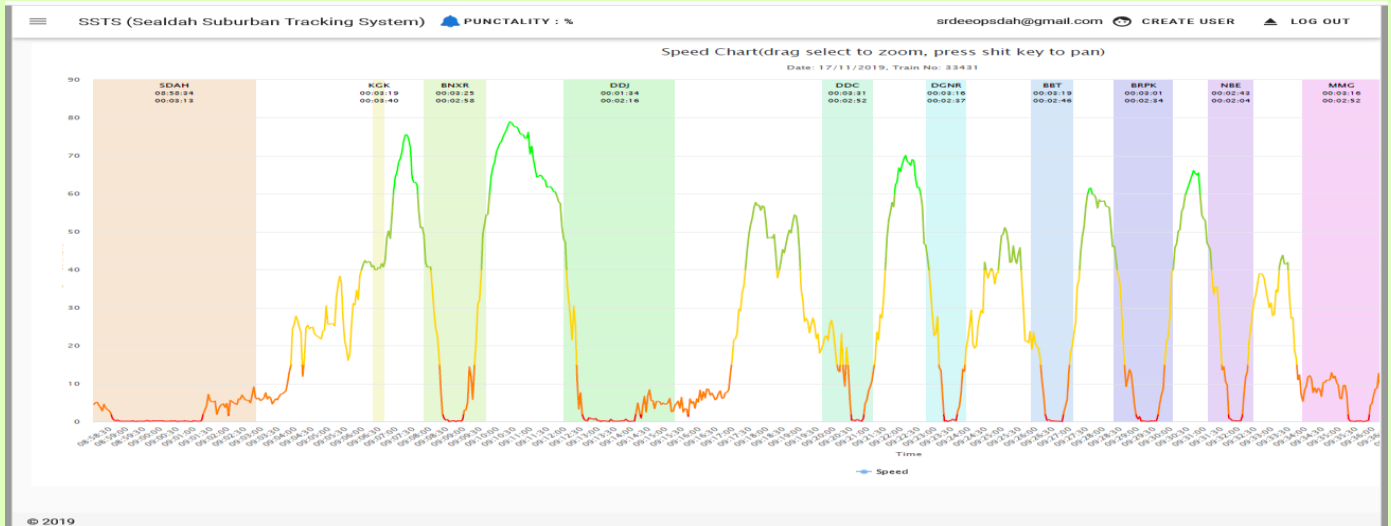
2.1.3 Instant generation of Train Report of all trains for detention analysis

Train Date	Train No	Rake No	ORG	Sch Dep.	Act Dep.	Late Dep.	DEST	Sch Arr.	Act Arr.	Late Arr.
12/12/2019	33231	NKG13012	DDJ	18:17:00	18:17:37	00:00:37	BP	18:42:00		00:00:00
12/12/2019	34427	SPR20093	SPR	17:43:00	17:43:48	00:03:24	SDAH	18:18:00	18:16:22	00:01:22
12/12/2019	31752	NKG11400	GEDE	17:35:00	17:37:09	00:02:12	RHA	18:30:00	18:29:28	00:00:32
12/12/2019	31628	BT50026	RHA	17:28:00	17:30:43	00:02:58	SDAH	19:10:00	19:35:06	00:25:21
12/12/2019	32240	NKG71000	DKAE	17:10:00	17:26:30	00:15:21	SDAH	17:55:00	18:14:25	00:21:25
12/12/2019	34849	SPR11410	DH	17:25:00	17:26:27	00:01:30	SDAH	19:08:00	19:07:49	00:00:11
12/12/2019	30112	SPR12258	BP	17:20:00	17:22:09	00:02:09	MJT	19:08:00	19:08:40	00:02:01
12/12/2019	34743	SPR10676	LKPR	17:10:00	17:10:42	00:00:42	SDAH	18:55:00		00:00:00
12/12/2019	31152	RHA11341	BWN	14:40:00	17:10:07	02:29:34	SDAH	17:40:00		00:00:00
12/12/2019	33844	BT50027	BNJ	16:53:00	16:58:27	00:05:27	SDAH	18:50:00		00:00:00

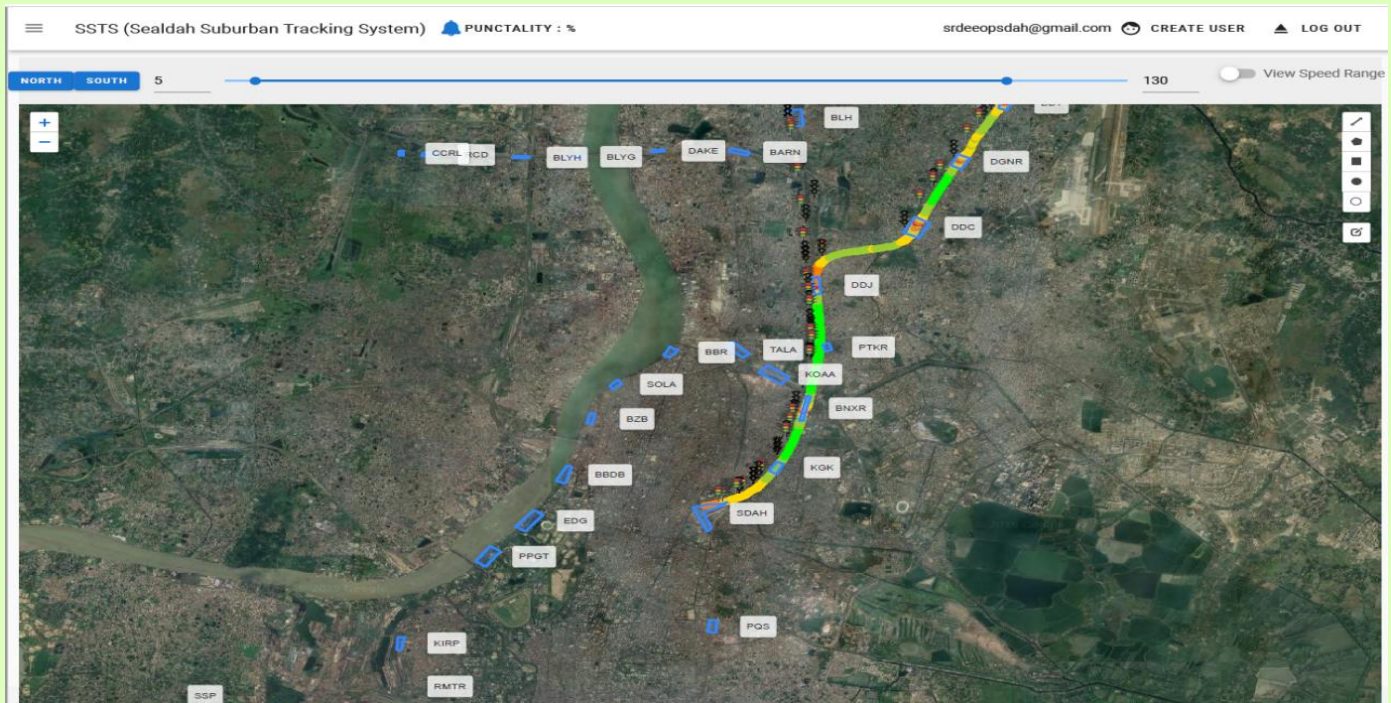
2.1.4 Instant CTR generation of all trains

SI No.	Station	Sch Arr	Sch Dep	Act Arr	Act dep	Late in	late_out	Geofence enter speed	Stop Time	Sec. loss/gain on run	Sec. Dist	Avg. Speed	Max. Speed
1	DKAE	00:00:00	07:02:00	07:02:03	07:03:09		00:01:09	0.1	00:01:06				
3	CCRL	07:06:00	07:06:00	07:09:51	07:09:54	00:03:51	00:03:54	67.5	00:00:00	00:02:42	3.854	34.51	76.4
4	RCD	07:07:00	07:08:00	07:10:45	07:11:15	00:03:45	00:03:15	47.9	00:00:30	- 00:00:09	0.438	30.92	67.5
5	BLYH	07:11:00	07:12:00	07:13:33	07:14:00	00:02:33	00:02:00	56.3	00:00:27	- 00:00:42	1.731	45.16	76.6
6	BLYG	07:13:00	07:14:00	07:15:48	07:16:12	00:02:48	00:02:12	44	00:00:24	00:00:48	1.043	34.77	56.3
7	DAKE	07:16:00	07:17:00	07:18:09	07:18:30	00:02:09	00:01:30	45.5	00:00:00	- 00:00:03	1.629	50.12	63.8
8	BARN	07:19:00	07:20:00	07:21:12	07:21:36	00:02:12	00:01:36	44.1	00:00:24	00:00:42	1.527	33.93	72.7
9	DDJ	07:29:00	07:30:00	07:40:15	07:40:45	00:11:15	00:10:45	7.5	00:00:30	00:09:39	4.48	14.41	75.1
10	BNXR	07:33:00	07:34:00	07:44:18	07:44:45	00:11:18	00:10:45	53.9	00:00:27	00:00:33	3.093	52.28	84.9
11	KGK	07:37:00	07:37:00	07:46:42	07:46:54	00:09:42	00:09:54	39.8	00:00:00	- 00:01:03	1.985	61.08	76.7
12	SDAH	07:46:00	00:00:00	07:53:48	08:03:18	00:07:48		7.5	00:09:30	- 00:02:06	1.703	14.81	39.8

2.1.5 Instant Speed Chart generation of all trains



2.1.6 View speed data of train on map with color code



2.1.7 View current Late running Trains and measure corrective action.

☰

SSTS (Sealdah Suburban Tracking System)

 PUNCTUALITY : %

 srdeepsdah@gmail.com

 CREATE USER

 LOG OUT

Trains Running Late

Last update: 18/11/2019 17:31:10

4

Search 

Train Date	Train No	Rake No	ORG	Sch Dep.	DEST	Sch Arr.	Staion	Sch Arr	Act Arr	Late in	Sch Dep	Act dep
18/11/2019	31530	BT10660	STB	15:40:00	SDAH	17:55:00	TGH	17:12:00	17:28:33	00:16:33	17:13:00	17:28:48

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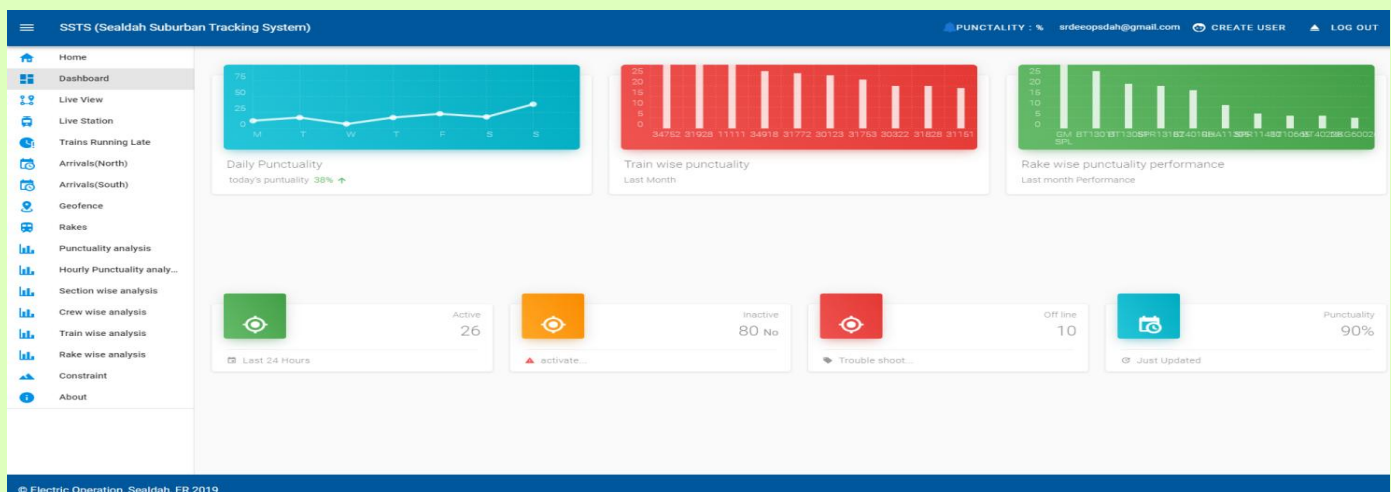
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2.1.8 View Arrival of Trains at destination and real time assignment of subsequent trains in real time.

SSTS (Sealdah Suburban Tracking System) PUNCTUALITY : % srdeepsdah@gmail.com CREATE USER LOG OUT												
Destination Arrivals				Last update: 18/11/2019 17:3 2:19 SDAH				Search				
Train Date	Incoming Train	Rake No	ORG	Sch Dep.	Last Staion	Last Stn Arr	Last Stn Dep	Sch Arr	Act Arr	Late in	PF No	Next Train
18/11/2019	31626	NKG13088	RHA	15:30:00	KGK	16:59:00	16:59:36	17:02:00	17:08:31	00:06:31		
18/11/2019	33840	BT80033	BNJ	15:22:00	KGK	17:20:12	17:20:33	17:20:00	17:26:15	00:06:15		
18/11/2019	31530	BT10660	STB	15:40:00	KDH	17:31:48	17:32:03	17:55:00		00:16:48		
18/11/2019	33532	BT12258	HNB	16:45:00	HRO	17:31:12	17:31:33	18:58:00		00:03:12		

2.1.9 Daily and monthly Summary report and chart for analysis of punctuality.



2.1.10 Other statistical reports for performance analysis of rakes and crews e.g.-

a) List of top & less performing crew

b) List of top & less performing rakes

SSTS (Sealdah Suburban Tracking System)							
<div> <div> <div>Home</div> <div>Dashboard</div> <div>Live View</div> <div>Live Station</div> <div>Trains Running Late</div> <div>Arrivals(North)</div> <div>Arrivals(South)</div> <div>Geofence</div> <div>Rakes</div> <div>Punctuality analysis</div> <div>Hourly Punctuality analy...</div> <div>Section wise analysis</div> <div>Crew wise analysis</div> <div>Train wise analysis</div> <div>Rake wise analysis</div> <div>Constraint</div> <div>About</div> </div> <div> <div>From Date</div> <div>27/12/2019</div> <div>To Date</div> <div>26/01/2020</div> <div>Search</div> <div>DOWNLOAD</div> </div> </div>							
Rake No	Avg. late arr.	Avg late dep	Max late arr	Max late dep	Total no of trains	Total no of Right Time trains	Punctuality (%)
GM SPL	01:17:59	00:00:00	01:17:59	00:00:00	1	0	0
BT13011	00:26:50	00:00:49	23:51:43	00:04:10	125	76	61
BT13051	00:21:08	00:02:04	23:50:53	00:07:42	75	50	67
SPR13152	00:20:12	00:01:11	23:56:47	00:04:02	86	57	66
BT40108	00:17:53	00:01:42	23:50:19	00:07:37	111	58	52
RHA11305	00:10:52	00:00:00	00:10:52	00:00:00	1	0	0
SPR11410	00:07:13	00:00:00	00:26:37	00:00:00	6	4	67
BT10665	00:06:02	00:00:00	00:16:34	00:00:00	5	3	60
BT40228	00:06:00	00:08:14	00:26:20	00:23:12	73	38	52
NKG60026	00:05:29	00:03:45	00:26:04	00:42:51	36	18	50
NKG11302	00:05:27	00:00:00	00:22:00	00:00:00	26	13	50
RHA11341	00:05:25	00:00:31	00:12:17	00:00:50	6	4	67
NKG80038	00:04:54	00:00:00	00:13:11	00:00:00	13	7	54

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c) Detection of list of frequent and repeating late running trains.

SSTS (Sealdah Suburban Tracking System)							
<div> <div> <div>Home</div> <div>Dashboard</div> <div>Live View</div> <div>Live Station</div> <div>Trains Running Late</div> <div>Arrivals(North)</div> <div>Arrivals(South)</div> <div>Geofence</div> <div>Rakes</div> <div>Punctuality analysis</div> <div>Hourly Punctuality analy...</div> <div>Section wise analysis</div> <div>Crew wise analysis</div> <div>Train wise analysis</div> <div>Rake wise analysis</div> <div>Constraint</div> <div>About</div> </div> <div> <div>From Date</div> <div>27/12/2019</div> <div>To Date</div> <div>26/01/2020</div> <div>Search</div> <div>DOWNLOAD</div> </div> </div>							
Train No	Avg. late arr.	Avg late dep	Max late arr	Max late dep	Total no of trains ↓	Total no of Right Time trains	Punctuality (%)
31513	00:04:28	00:02:26	00:14:52	00:03:11	16	13	81
31520	00:01:06	00:01:13	00:18:25	00:02:00	16	12	75
31221	-00:00:22	00:01:25	00:12:43	00:02:08	15	14	93
31518	00:05:05	00:00:00	00:17:19	00:00:00	14	8	57
31614	00:04:59	00:00:07	00:12:20	00:00:08	14	5	36
34791	00:01:58	00:00:00	00:23:42	00:00:00	14	11	79
34511	00:01:20	00:00:29	00:11:08	00:00:39	14	2	14
31913	00:00:20	00:00:59	00:07:11	00:00:59	14	11	79
31918	00:07:48	00:00:23	00:17:11	00:00:42	13	6	46
31833	00:07:40	00:00:15	00:26:04	00:00:15	13	8	62
31836	00:07:28	00:00:17	00:14:34	00:00:17	13	4	31
31511	00:06:54	00:00:00	00:15:47	00:00:00	13	3	23
31920	00:04:34	00:00:00	00:21:10	00:00:00	13	1	8

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d) Summary of section-wise max & average speed for a period

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e) Hourly analysis of punctuality of suburban trains (pick& non-pick etc.)

SSTS (Sealdah Suburban Tracking System)				
PUNCTUALITY : % srdeepadsah@gmail.com CREATE USER LOG OUT				
Home				
Dashboard				
Live View				
Live Station				
Trains Running Late				
Arrivals(North)				
Arrivals(South)				
Geofence				
Rakes				
Punctuality analysis				
Hourly Punctuality analy...				
Section wise analysis				
Crew wise analysis				
Train wise analysis				
Rake wise analysis				
Constraint				
About				

From Date	To Date	Search	DOWNLOAD
26/12/2019	25/01/2020		

Hour	Total Trains	No of Right Time Trains	Punctuality (%)
00:00:00	122	80	66
04:00:00	910	622	68
08:00:00	1359	904	67
12:00:00	732	472	64
16:00:00	940	528	56
20:00:00	832	545	66

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2.1.11 Procedure for Starting up the Device

- Turn on the unit by pressing the “on/off” button for 4-5seconds until the indicator is flashing.
- After 45 seconds, the unit will begin to work and acquire the GSM signals as well as the GPS signals. The indicator will keep flashing every 3 seconds when the unit has received the signals.

2.1.12 Specification of the selected GPS device & Hardware Description

Content	Specs.
Dim.	65mmx 46mmx 17mm
Weight	35g
Work Voltage	110–220V input 5V output
Battery	Chargeable 3.7V 850mAh Li-ion battery

HARDWARE DEVICE



3 GENERAL RULE

3.1 ADDENDUM AND CORRIGENDUM TO THE GENERAL AND SUBSIDIARY RULE BOOK

3.1.1 Addendum & corrigendum 48th

No. SWR/RIVN/CS/GR&SR/19

Sealdah, dated- 09.07.2019.

Ref: PCOM's letter No.TG.202/CS/G & SR/Pt. XV Kolkata, dated 25.06.2019

Sub: **48th Addendum & Corrigendum** (Reprinted 2003)/ 26th Addendum & Corrigendum (Revised & Reprinted 2012) to the General & Subsidiary Rules Book for your information and necessary action please. DA: As stated above.

Delete the existing SR 16.01 (2) and substitute by the following SR:

SR 16.01(2): Certificate of competency –

Sr. Section Engineer / Jr. Engineer (Signal) must invariably be associated with the test in case of Gateman posted at interlocked Level Crossing Gate. The certificate of competency should be jointly signed by SSE/JE (Signal) and TI or SSE/JE (P. Way) as the case may be. The competency certificate shall be valid for a period of five years.

Certificate of competency

Certify that I have examined Sri..... S/O

Sri Designation in the duties of

Gate Man. He is conversant in the use of hand signals, detonators and other equipment provided at the gate. He is also conversant with the procedure to be adopted during abnormal conditions. He is competent to operate Mechanical Lifting Barrier (MLB) / Electrical Lifting Barrier (ELB) or both.

Signature

Designation – **SSE/JE (Signal)**

Signature

Designation – **T.I or SSE/JE (P. Way)**

(Strike out whichever is not applicable)

3.1.2 Addendum & corrigendum 49th

No. SWR/RIVN/CS/GR&SR/19

Sealdah; dated- 30.07.2019.

Ref: PCOM's letter no. TG.202/CS/G & SR/Pt. XV Kolkata, dated- 17.07.2019

Sub: **49th Addendum & Corrigendum** (Revised and Reprinted 2003)/27th Addendum & Corrigendum (Revised & Reprinted 2012) to the General Subsidiary Rules Book for your information and necessary action please.

Delete the existing SR 16.03(iii) (a) (IV) and substitute by the following SR

SR 16.03(iii) (a) (IV): When the gateman desires to open the Non-Interlocked L.C. Gate for passage of road traffic he should ensure that:-

(a) He has not exchanged any private number with station/cabin as per (a) (ii) above or

(b) If he has exchanged private number with the Station Master/Cabin Master, the whole of the train with last vehicle indicator has passed over Level Crossing Gate and the Station Master/Cabin Master has not exchanged private number with him for any other movement immediately in rear of that train or on the adjacent line(s).

On duty gateman should also check the register and ensure / verify that all columns of the following table are properly filled before opening the L.C/Gate for road traffic.

1	2	3	4	5	6
Date	Train No.	Time of private number exchanged for closing	Private No. of Gate / Station/Cabin	Whether L.V. Board/Tail Lamp is verified (Yes/No.)	Signature of on duty Gateman

Gateman shall also ensure before opening the gate for road traffic that the banner flag / danger signal shall be displayed at either side of the track at a distance of 5 meters away from the L.C/Gate. Then he shall open the L.C/Gate for passing the road traffic, keeping a red flag/red hand signal lamp ready in his hand to stop approaching train, if required.

3.2 SAFETY CIRCULAR

3.2.1 No. ELS/6/7

Sealdah, dt.05.07.19

3.2.1.1 Sub: Safety Drive

Ref: i) RB's L/No. 2019/Safety (A&R)/19/17, dtd. 27.06.19
ii) CSO/ER's /No.TA.5/61/Spl/RB/Pt.XVII, dtd. 02.07.19

On 25th June, 2019, there has been a case of collision on E.C. Railway where a passenger train collided with OHE Tower Wagon in mid section between Singapore Road and Keutguda Stations. Pending CRS inquiry, it has been reported prima facie that there has been failure of Railway staff at multiple levels and the block instruments and the panel room appear to have been tampered with. Such cases are cause of serious concern.

In this connection, a week long drive to be launched to sensitize all staff to strict observance of Block Working Rules, Safety Precautions and Non adopting any Short Cut Method of procedure which may lead to serious threat to safety and be ensured the rules with Form & Speed for Single Line Working on Double Line in Absolute Block System and in Automatic Section.

Rules for Single Line Working on Double Line

1. In Absolute Block System

For Wrong Line –

i) T/D 602 which includes –Authority to precede, Authority to Pass Departure Stop Signal & Caution order.

ii) T/511 starting order.

iii) T/806 Shunting order if required.

For Right Line -

i) T/D 602 which includes –Authority to precede, Authority to Pass Departure Stop Signal & Caution order.

ii) Drivers of all train, besides temporary speed restriction/ caution will be informed the following-

a) Line by which the train will run.

b) KM of obstruction.

c) There is no trap point / points are closed.

d) Inform gang man and gate man reroute (for 1st train).

e) Observe neutral section (for electric traction on wrong line)

f) All trains running on wrong line will keep Flasher light switched 'ON' up to the next station or to which the authority to proceed is valid.

Speed of the first train will be restricted to **25 kmph** and all subsequent train will run at booked speed.

2. Reception of the Train

For Right Line

By taking-off signal

For Wrong Line -

The train will stop at the first Stop signal of the right line or the last Stop signal of the wrong line which ever driver meets first. The train will be received by issuing T/409 and piloting by a competent Railway servant

3. In Automatic signalling Section

For Wrong Line –

i) T/C 1425 for UP Train (PLCT)

T/D 1425 for DN Train (PLCT)

ii) T/A 912 An authority to pass automatic, semiautomatic, manually operated signal provided hand signal displayed at the foot of semiautomatic, manually operated and gate stop signal.

iii) T/409 caution order.

iv) T/511 Starting order.

v) T/806 for shunting if required.

Speed of all trains will be restricted to 25 kmph.

Flasher light should be switched ON wrong line up to the next destination station.

For Right Line -

i) T/C 1425 for UP Train (PLCT); T/D 1425 for DN Train (PLCT)

ii) T/A 912

iii) T/409 Caution-order

Speed of first trains will be restricted to 25 kmph. All second and subsequent train on right line may be allowed to follow on automatic signal indications.

The driver of each train will be given the following information on T/409-

- i. Line by which the train will run.
- ii. KM of obstruction.
- iii. Speed restrictions if any.
- iv. Inform gang man and gate man en-route (for 1st train)

NB: The instruction that automatic signal on wrong direction should be considered as out of use.

Reception of train -

For Right Line – By taking off signal.

For Wrong Line- The train will stop at the first Stop signal of the right line or the last Stop signal of the wrong line which ever driver meets first. Train will be received by issuing T/409 and piloting by a Railway servant.

3.2.2 No. ELS/6/11

Sealdah, dt.05.07.19

Sub: Implementation of Real-Time Train information System (RTIS) Phase-I on Indian Railway

Ref: PCOM/ER/KKK's L/No-TP.183 /FOIS/RTIS/2019 dtd. 25.06.19

Vide letter under reference, 59 locomotives of HWH loco shed have already been fitted with RTIS equipments in HWH Loco shed and remaining will be fitted with the said devices shortly.

List of Do's and Don'ts are to be followed by the Crew / Maintenance Staff after installation & commissioning of the RTIS devices in Locomotives.

Don'ts:

Do not 'switch off' the MCB providing supply to RTIS Loco device in locomotives.

Do not temper the display, cables & connectors of RTIS Loco device.

Do not remove the cables / connectors of the RTIS device.

Do's:

- i) RTIS MCB installed in the SB-1 rack should be ON. If the device is in cab no 2 then MCB for RTIS will be in SB-2 panel
- ii) All the cables & connectors should be plugged and tight.
- iii) LED on IRN & RMT should be ON.
- iv) LEDs on the PMU (Power Management Unit) of RTIS Loco devices should be ON.
- v) All the screws on IRN & RMT should be properly tight.
- vi) Conduit and wiring of RTIS Loco devices should be OK.

You are hereby advised to counsel all the staff under your control working in Mail/Exp & Passenger Trains on the above instructions.

3.3 SAFETY ALERT ADVICE

3.3.1 Instructions for loco pilot:

Following instructions are once again reiterated and to be followed strictly by all Loco Pilots Shunter

- 1) Motormen should be very careful while approaching a Dock & Dead end Platform.
 - 2) The speed of the trains while entering Dock PF is limited to 10 kmph & the speed of EMU / MEMU while entering a Dead end PF is restricted to 15 kmph at terminal stations [SR-4.10 (i) & (ii)] or as below as mentioned in local approved instructions.
 - 3) Motormen shall keep the reverser handle in the " Forward " or in the " Reverse" position when the train is in motion and shall not move the reversing handle into the 'OFF' position until after the train has come to a stand/stop - SR 4.21 [4] [b].Keep Brake Controller handle on release position
 - 4) In case of emergency situation like above incident, if concentration of motorman is hampered by any external force on run, he should immediately apply emergency brake along with **Dead-man's emergency** valve to stop the train and shall inform to the working Guard of the train & on-duty TLC and the train should be re-started in consultation with the Guard, if it is considered safe to proceed.
 - 5) Cab door will remain closed during run. Any abnormality regarding proper locking of cab door, deficiency / damage of window net of cab door noticed by motorman to be informed immediately to on duty TLC & invariably recorded in the Log Book.
- The above instructions should be followed strictly by all motormen.

3.3.2 Sub: Procedure of Cab Changing of EMU/MEMU & Cab changing in Locomotive:

3.3.2.1 NO. ELS/6/11

Dated. 06.07.19

Procedure of Cab Changing of EMU/MEMU

- a. Stop the Train
- b. Apply Emergency brake; ensure BP drops to '0' and Br/Cylinder. Pressure shows up to 1.6 kg /sq. cm.
- c. Put OFF Control Switch
- d. Put OFF BLEP Switch
- e. OFF BIVS fully and take out EP key
- f. Ensure that BP is not charging further
- g. Lock BL
- h. Take out all the keys (Reverser key, BIVS key and BL key)
- i. Go to rear motor coach, Un-lock BL (Inform Rear cab LPS through Talk Back.
- j. Turn ON BIVS' and ensure BP is charged to 4.5 kg/sq.cm.
- k. Check Brake Application and release before moving rake

Cab changing in Locomotive:

1. Stop loco with application of loco brake by SA-9, trip DJ put ZPT on '0' and see lowering of Pantograph
2. Isolate isolating cocks of A-9 and SA-9 (4 nos.)
3. Open out all the operational keys and come in leading cab
4. Put A-9 & SA-9 isolating cock on normal position

5. Unlock BL key and see glowing of all pilot lamps.
6. Put ZPT on position '1'
7. Put 'ON' BLDJ and press BLRDJ, loco should be closed and release BLRDJ when Pilot lamp LSCHBA extinguished. After DJ closing & pressure ready work the train as usual.

Cab changing in Multiple Locomotives:

1. Stop loco with application of loco brake by SA-9, trip DJ put ZPT on '0' and see lowering of Pantograph
 2. Isolate isolating cocks of A-9 and SA-9
 3. Put MU-2B on TRAIL position and isolate L & T Cock.
 4. Open out all the operational keys and come in leading cab of rear loco.
 5. Put L & T cock on normal position
 6. Put A-9 & SA-9 isolating cock on normal position
 7. Put MU2B on Lead position
 8. Unlock BL key and see glowing of all pilot lamps.
 9. Keep BLSN remain on OFF' position, put ZPT on position '1 And see the rear pantographs of both locos are rising
 - 10 Put 'ON' BLDJ and press BLRDJ, loco should be closed and release
 11. BLRDJ when Pilot lamp LSCHBA extinguished.
- After DJ closing & pressure ready work the train as usual.

In this regard it is reiterated that LPS after taking charge at Platform / Yard or at Trip shed must check proper functioning of sanders & wipers including availability of sand in sand box of the locomotives especially throughout the monsoon season and any shortcomings must be reported immediately to TLC/SDAH and SSE / Trip shed for necessary attention / rectification.

3.3.3 Sub. Failure of rake due to mal operation of BL Key

3.3.3.1 No. ELS/6/5

Sealdah, dt.14.08.19

Reasons: Failure of BL key inserting may be due to the following reasons-

1. BL key is not inserted due to key open out without proper locking/Grip screw not set inside Bush slot.
2. BL key is not inserted due to programmed switch square shaft not insert inside square hole of BL key.
3. Programmed switch shaft and grab screw not in same axis
4. Male operation by motor-man while locked or un-locked.
5. In this regard, all the motormen are hereby advised that during inserting of BL key into the slot for proper setting earlier instruction to be reiterated – "*BL key to be unlocked and locked by using 2 hands (BL key Head to be pressed with one hand and shaft to be rotated with other hand)*".

3.3.4 Sub: 30 days Zonal Railways Safety Drive

3.3.4.1 ELS/6/Mail/Exp

Sealdah, dt.29.08.19

Ref. i) PCSO/ER's L/No. TA.5./61/9/Pt. XVIII, dated. 08.08.19

ii) AOM/S/SDAH's L/No. TS/S/Safety Drive/24/2019, dated. 08.08.19

Vide letter under reference, a 30 days safety drive to be launched with immediate effect on the following aspects-

- 1) Strict adherence to GRs and SRs, aspects of signals while working trains.
- 2) In case train is passing the Signal at Danger, SM will ask the Guard/LP/ALP through VHF / Walkie-Talkie to stop the train immediately by applying emergency brake.

Therefore, all LPs, LPSs & Alps are hereby advised to follow GR & SRs while on run & specially during approaching diversion to be ensured about the setting of points in favor of his/her train and apply emergency brake on getting any adverse report by SM through Walkie-talkie.

Therefore, you are hereby advised to counsel all the LP & Alps under your control.

3.3.5 Sub: Counseling on Shunting operation

3.3.5.1 No. ELS/6/7

Sealdah, dated - 26.08.19

Following instructions on Shunting operation are reiterated for strict compliance by all the Loco Pilot (Goods), LPSs & Alps while on duty to prevent incidents of SPAD/ Accident.

GR 5.13:

- (1) Shunting operations shall be controlled by fixed or hand signals or by verbal directions.
- (2) The Loco Pilot shall not, however depend entirely on signals and shall always be vigilant and cautious.
- (3) The speed during shunting operations shall not exceed 15 kilometers an hour unless otherwise authorized by special instructions.

SR.5.13 [a]

Where shunting is necessary, following further precautions will apply –

- (i) Maximum impact speed when shunting a single box wagon must not exceed 5 kmph.
- (ii) Maximum impact speed when shunting a group of five box wagons coupled together with transition couplers at either end should not exceed 2.5 kmph.
- [b] (ii) When the train or the banking engine is to be attached or any shunting is to be done for attaching or detaching coaches of any passenger carrying train, the train engine or the banking engine or the shunting engine must first come to a halt 20 meters away from the train and move thereafter cautiously towards the train for being attached to the train or otherwise as necessary.
- (iii) At originating/ loco changing station where the movement of loco is controlled by fixed signals, attaching/ detaching on train shall be under personal supervision of loco pilot/asst. loco pilot. At roadside station, such attaching/detaching shall be done by station staff.
- (iv) The following categories of staff shall be deemed to be authorized to supervise shunting of a train not carrying passengers; Station Master/ Guard /Yard Master/Asst. Yard Master /Asst. yard foreman/shunting master/shunting

Jamadar / shunt man / Points man or such other categories as may be prescribed in the station working rules; But in case of any passenger carrying train, the responsibilities for the supervision of shunting should not vest with an official below the rank of a shunting jamadar.

GR. 5.14 Responsibility for shunting

The station Master shall see that the shunting of trains or vehicles is carried on only at such times and in such manner as will not involve danger.

SR.5.14 [a]

Subject to the provisions rules 5.19(1), the shunting of a train from one line to another and to give precedence to another train or for any other purpose, shall be conducted by the guard under the order of station master with the assistance of Yard Foreman/ Shunting Master/Shunting Jamadar/Shunt man/Points man/Station porter where there is one. The guard /yard foreman/shunting master/shunting jamadar shall be responsible for seeing that the points over which train has to move are properly set and secured for giving the proper signal. The responsibilities for the supervision of shunting of any passenger carrying train and mixed trains should not vest with an official below the rank of a shunting Jamadar

[b] No person other than the guard (or shunting Jamadar where available) shall give a signal to Loco Pilot to shunt. Guard shall assist the Loco Pilot by applying his brake, if necessary, and the Loco Pilot shall signal with his engine whistle as soon as the engine is clear of the main line.

[c](i) The Station Master shall issue form T/806 which shall be signed by the Guard/Shunting jamadar and the Loco Pilot for shunting of all trains from a running line to a siding, from one running line to another or on the line same line if such shunting fouls the facing and trailing points at either ends, unless such movements can be governed by the fixed signals. When, however, one fixed signal governs, movements from more than one line or siding, Form T/806 must be issued.

[ii] The Station Master shall also issue T/806 wherever-

[a] Signal governing such shunting is defective and

[b] There is no advance starter and the starter is the last stop signal.

[d][i] In case, however, of a train shunted engine foremost into a dead-end siding, and order on Form T/806 written and signed by Station Master and counter signed by the Guard/Shunting Jamadar shall be sent to the Loco Pilot to back his train out of the siding. The Loco Pilot on receiving the written orders will comply with it when the proper signal has been exhibited by the Guard/Shunting jamadar.

ii) Lights on buffer stops of dead ends. - No red lights on buffer stops shall be used in places where such lights can be seen by Loco Pilots of running trains, either on entering or leaving station. Only 'white' lights shall be placed on such buffer stops and a list of stations where white buffer lights are provided is embodied in the Working Time Table for the guidance of Loco Pilots.

At terminal and other stations not included in the list where buffer lights are provided, they shall show red.

(e) Whenever an engine has to be attached on to vehicles, at night, the Guard/Shunting Jamadar conducting the shunting shall show a white light on to the stationary vehicles from the Loco Pilots side, when the engine is near the vehicle.

(f) (i) When carriages or wagons have to be attached or detached at Stations where there is no shunting Jamadar, the guard shall proceed with that portion of his train which has to pick up or detach the wagons or carriages.

(ii) **At originating / intermediate depot stations such attaching / detaching of vehicles shall be conducted by the Operating staff as detailed vide SR 5.13(b) (iv).**

(iii) At Roadside station such shunting of vehicles, inspection carriages, slip coaches, VP etc shall be conducted as per detailed vide SR 5.14(f) (i).

(g) At any station where AYMs. / Shunting Jamadars are provided if shunting on through train is to be performed by guard of the train.

(h) **When shunting operations are not governed by fixed signals, the correct setting and locking of points and the permission to commence a shunting movement shall be indicated by the cabin / the ground-frame goomty by displaying a green signal to the Guard / shunting jamadar supervising the shunting movement.**

During day time, in absence of flags, the 'red' signal shall be given by the person in charge of shunting operation by raising both arms with hands. During night, hand signal lamps must be used to exhibit the signals.

(i) The Station Master on duty of the concerned station shall exchange a private number with the section controller as an assurance that the relevant facing points have been set and locked.

SR 5.16

Shunting during reception of train.-When signal have been taken 'off' for an incoming train on to a line which is not isolated, no shunting movement shall be carried out towards points over which the incoming trains is to pass.

SR 5.16(1)

Shunting during reception/dispatch of trains- When signals have been taken 'off' for an incoming/ Outgoing train on/ from a line which is not isolated, no shunting movement shall be carried out towards the points over which the incoming / outgoing train is to pass except on stations where frequent shunting movement take place and where such points are protected by stop signal or by a shunt signal or by a stop board with the precautions to be observed while performing shunting that-

(a) Shunting shall be carried out under the supervision of authorized competent railway servant.

(b) Rake/Load should be fully Vacuum / air brake.

(c) The maximum speed during shunting operations shall not exceed 15 kmph.

GR 5.17

Shunting near Level crossing the railway servant in charge of shunting near or across a level crossing, before giving permission to the Loco Pilot to move his train across it, shall ensure that the level crossing gates have been closed and locked against road traffic.

GR 5.20

Shunting on gradient- When shunting is being performed on a gradient, the railway servant in charge of the shunting shall ensure that-

(a) Sufficient number of brakes are put on, sprigs are used, where necessary, slip siding point or traps , where provided, are set to ensure safety and that all precautions are taken to prevent vehicles getting out of control, and

(b) In case of shunting over a portion of line on steep gradients, neither isolated not protected by slip sidings, an engine is also attached towards the falling side of the gradient.

Note: For purpose of this rule a steep gradient shall be 1 in 260 or steeper except in case of vehicles fitted with roller bearings, when it shall be 1 in 400 or steeper.

GR 5.21

Loose shunting- Cranes, vehicles containing passengers, workers, explosives, dangerous goods or Live stock or any other vehicles that may be specified under special instruction , shall not be loose Shunted and no loose shunting shall be made against them.

* In case of shunting where LPS is provided at both end of a rake, proper shunting authority (T/806) is to be ensured by the LPS of both end before starting of shunting operation.

*Driving /pushing should not be carried out from rear cab except in unavoidable situation with permission of TLC on duty.

3.3.6 Sub: Counseling on Automatic, Semiautomatic Signals & Gate stop signal.

3.3.6.1 No. ELS/6/7

Sealdah, Dated. 19.09.19

Sub: Counseling on Automatic, Semiautomatic Signals & Gate stop signal.

You are hereby advised to counsel all the Loco Pilots, Alps & LPSs under your control on the following instructions –

GR/ SR	Stop Signal
	<p>Passing of a gate Stop signal at 'on' GR 3.73</p> <p>(1) When a Loco Pilot finds a gate Stop signal at 'on', he shall sound The prescribed code of whistle and bring his train to a stop in rear of the signal.</p> <p>(2) (a) If the gate Stop signal is provided with a 'G' marker, the loco pilot shall wait at the signal for one minute by day and two minutes by night, and if the signal is not taken 'off' within this period, he may draw his train ahead cautiously up to the level crossing, and</p> <p>(b) If the Gateman is available and exhibiting hand signals, proceed further past the gate cautiously, or</p> <p>(c) If the Gateman is not available, or, is available but not exhibiting hand signals, he shall stop short of the level crossing, where he shall then be hand signaled past the gate by the Gateman, if there is one or in the absence of a Gateman, by one of the members of the engine crew of the</p>

GR 3.73	<p>Train after ascertaining that gates are closed against road traffic.</p> <p>(3) If the Loco Pilot finds, after stopping at the signal, that there is no 'G' marker, he shall proceed further only in accordance with the procedure laid down under special instructions.</p> <p>*When a Loco Pilot finds a gate stop signal at 'ON' he should bring his train to a stop in rear of the signal, wait for one minute by day or two minutes by night and if the signal is not taken 'off' he will draw his train ahead cautiously and then he pass the Gate by proceed hand signal displayed by the Gateman if there is one and in <u>absence of a Gateman by Assistant Loco Pilot or by the Guard of the train after ascertaining that the gates are closed against road traffic.</u></p>
GR/SR 9.02 & 9.07	<p>Automatic Stop Signal GR / SR 9.02</p> <p>When a Loco Pilot finds an automatic stop signal with an 'A' marker at 'ON', he shall bring his train to a stop in rear of the signal and wait there for one minute by day 2 minutes by night. If after waiting for this period, the signal continues to remain at 'ON', he shall give the prescribed code of whistle and exchange signals with the Guard and then proceed ahead, as far as line is clear, towards the next stop signal in advance with great caution at a speed never exceeding 15 (fifteen) kmph so as to stop short of any obstruction until he reaches near the obstruction or near the next automatic signal, as the case may be, even if this signal may from some distance be seen exhibiting 'OFF' aspect and shall act upon its indication only after he has reached it.</p> <p>Where owing to the curvature of the line, fog, rain or dust storm, engine working the train pushing it, or other causes the line ahead cannot be seen clearly, the Loco Pilot shall proceed at a very slow speed which shall under no circumstances exceeds 10 kmph. Under these circumstances, the Loco Pilot, when not accompanied by an ALP, and if he considers necessary, may seek the assistance of the Guard by giving prescribed code of whistle.</p>
GR / SR 9.14	<p>Semi - Automatic Stop Signal GR / SR 9.14</p> <p>When a semi automatic stop signal is worked as an Automatic Stop signal, Loco Pilot shall follow GR/SR 9.02 or 9.07.</p> <p>When a Semi Automatic Stop signal is working as manual stop signal and becomes defective it may only be passed with T-369 (3b) or T-369(1) or by taking ' off ' the Calling ON signal where provided.</p> <p>When a Loco Pilot is authorized to pass a Semi Automatic Stop signal at 'ON' by taking 'off' Calling-ON signal fixed below it, he shall follow the precautions stipulated in GR/SR 9.02 or 9.07. GR 9.14</p>

<u>GR 9.15</u>	<p><u>Semi - Automatic Stop Signal GR 9.15</u></p> <p>Passing a Gate Stop Signal at 'ON' in Automatic Signaling territory – if the Loco Pilot finds a Gate Stop Signal at 'ON' in an Automatic Signaling territory-</p> <p>a) He shall comply with the provisions of rule GR/SR 9.02 or 9.07 as the case may be, if the 'A' marker is illuminated.</p> <p>b) (i) if the 'A' marker light is extinguished , he shall sound the prescribed code of whistle to warn the Gateman and bring his train to a stop in rear of the signal, and</p> <p>(ii) if after waiting one minute by day two minutes by night, the signal is not taken 'off ' , he shall draw his train ahead cautiously up to the level crossing, and</p> <p>(iii) if the Gateman is available and exhibiting hand signals, proceed further past the level crossing gate cautiously, or</p> <p>(iv) if the Gateman is not available or is available but not exhibiting hand signals , stop in rear of the level crossing and after ascertaining that the gates are closed against road traffic and on getting hand signal from the Gateman, and in his absence from ALP, the LP shall sound the prescribed code of whistle and cautiously proceed up to the next stop signal at a speed never exceeding 15 kmph / 10 kmph (when the line ahead cannot be seen clearly) complying with the rule GR/SR 9.02.</p>
<u>SR 9.15</u>	<p><u>Semi - Automatic Stop Signal SR 9.15</u></p> <p>If the LP finds a Gate Stop signal provided with illuminated 'AG' marker at ON in an Automatic Signaling territory,</p> <p>a) We shall comply with the provisions of GR/SR 9.02 or 9.07 as the case may be, if the 'A' marker is illuminate but the 'AG' marker is extinguished.</p> <p>b) If the 'A' marker light is extinguished but the 'AG' marker lit, he shall comply with the provisions of clause (b) of GR 9.15.</p> <p>(c) If both the 'A' marker and 'AG' marker lights are extinguished he shall sound the prescribed code of whistle to warn the Gateman and bring his train to a stop in the rear of the signal. Thereafter, he shall proceed further only in accordance with the procedure laid down under special instructions.</p>

3.3.7 Sub: Recovery of Vigilance Penalty Brake for 3-phase locomotives

3.3.7.1 No. ELS/6/Mail Exp

Sealdah, dated. 24.09.19

When Fault message no. F1003P1 appears on DDS screen (vigilance emergency brake application), the recommended procedure is –

- i) Move throttle to 'O' and move A-9 (DBC) to emergency position (To arrest BP dropping)
- ii) Wait for 120 sec for WAP-5 locos & 160 sec for WAP-7 & WAG-9 locos.
- iii) Press the switch BPVR to reset on panel 'A'.
- iv) Press the button BPVR, LSVW will be extinguish and buzzer will stop sounding
- v) Press & release VCD pedal switch.
- vii) Acknowledge the fault by pressing BPFA.

viii) MR / BP pressure will be normal & resume traction.

For Knnor break loco –

- i) Bring throttle 'O'.
- ii) Keep throttle on 'O', and move A-9 (DBC) to emergency position (to arrest BP dropping).
- iii) Wait for 32 sec LSFI will blink continuously.
- iv) Press the switch BPVR to reset on panel 'A'.
- v) Acknowledge the fault by pressing BPFA.
- vi) to charge BP pressure keep A-9 (DBC) handle on 'RUN' position.
- ix) MR / BP pressure will be normal & AFI will come down and resume traction.

*****To minimize the detention in block section the following short cut method may be applied (only to clear the block section) -**

- i) Bring throttle to 'O'.
- ii) As soon as possible operate rotating switch 237.1 from position 1 to position 0 provided in SB-1 Panel.
- iii) BP pressure destruction will be stopped and BP will start building up. After that a fault message F1105P2 (rotary switch vigilance off) will display on DDS screen. Acknowledge it by pressing switch BPFA.
- iv) Resume traction after MR & BP pressure become normalized and AFI comes down.

After clearing the block section switch 237.1 should be normalized at first available opportunity. Again a fault message of F1003P1 (Vigilance Emergency Brake application) will appear; acknowledge it by pressing BPFA.

3.3.8 Sub: 15 days Railways Board Safety Drive on “Prevention of Fire in Train”.

3.3.8.1 No. ELS/6/7

Sealdah, dated.10.10.19

Ref. i) PCSO/ER's L/No. TA.5./61/9/Safety-1/3/2, dated. 19.09.19

ii) DSO/SDAH's L/NO-TS/S/Safety Drive/25/RB/2019, Dt-20.09.2019.

Vide letter under reference, a 15 days Railway Board safety drive on “Prevention of Fire in Train” to be launched with immediate effect on the following aspects-

- x) Adequate and proper maintenance of electrical devices in the coaches, LOCOs, EMUs, special Vehicles, MEMUs, DEMUs. You are hereby advised to counsel all the staff under your control working in EMU, MEMUs & Loco hauled trains on the above instructions.

3.3.9 Sub: 30 days Zonal Railway Safety Drive

3.3.9.1 NO. ELS/6/7

SDAH Dated. 16.10.19

Ref. i) CSO/ER's L/No. TA.5/61/9/Pt.XVIII. dtd. 03.09.19

ii) DSO/SDAH's L/No. TS/S/Safety Drive/26/2019, dated. 04.10.19

In continuation of letter under reference (ii), 30 days Zonal Railway Safety Drive will be continued on the following instructions as per Annexure –I (Sl. No. 12, 13& 16) & Annexure –II under reference –

(i) Are reiterated for strict compliance by all the LPs LPSs & ALPs while on duty to prevent incidents of SPAD/ Accident.

3.3.10 Accidents due to Rolling down of Stocks

- i) Failure on part of crew to secure the dead loco or train as per extant rules.
- ii) Failure in following the prescribed procedure for securing of vehicle in area with gradient.
- iii) Non setting of points towards dead end for stabled rake in yard.
- iv) Stabling in the line where 'no stabling is prescribed'
- 2) Collision due to disregarding of Signal.
- 3) Accident of dashing with RCC Buffer due to late application of emergency brakes.
- 4) Accident at Manned Level Crossing Gate due to negligence on the part of Gateman.
- 5) Derailment due to non setting, clamping and pad locking of points.

Annexure-I:

Sl. No. 12 - Preventive checks regarding fire safety and precaution of Rajdhani and Shatabdi trains.

Sl.No.13 – Preventive checks regarding fire safety and provision and use of fire extinguisher in Driver/Motorman/Guards' cab.

LPs, LPSs & Alps will check the availability & validity of Fire Extinguishers in Loco & EMU/MEMU Cab at the originating / starting / shed out points.

Sl. No. 16- Alertness on the part of station staff, cabin staff, gateman and running staff for exchanging all-right signal and safe passage of trains.

Observance of GR/SR 4.42 while exchanging all right signals with Guard & Station Staff.

Annexure-II: Enclosed herewith.

Preventive measures to be taken to prevent SPAD which are enumerated in

Annexure-II

You are hereby advised to counsel all the LPs, LPSs & Alps under your control and a feed back to be sent after completion of drive on 06.11.19 for onwards compliance to HQ.

3.3.11 Sub: Counseling on Cab occupation in 3-phase EMU

3.3.11.1 NO. EL OP/ 6/5 dated. 22.10.19

Instructions:-

- 1) First put ON - ICS/BIVS (If MC is ON and MR is OK), ensure BP is raising, after BP reaches to 4.6 kg/cm^2 , EMR brake light will extinguish and put DCS (BL Key) ON, self testing will start, BC gauge needle will come down to 0.8 kg/cm^2 from 1.2 kg/cm^2 .
- 2) If MC is off, then put ON DCS key and give MC ON command and see MC is closed and ensure there is sufficient MR pressure. If MR is not OK, then give "Start

all MAC" command (by switch or from DDU). When MR pressure reaches 6-7 kg/cm² then put ON ICS key to build up requisite BP pressure.

3) Then Cab occupation symbol will turn from white to blue & indication of particular OCCUPIED basic unit will be shown.

If failed –

1. ICS bypass switch put at ON (11 o'clock to 1 o'clock provided on CRW panel). If succeeds, work normally. If still un-successful, check MCB No. GC F-1 (provided on MCB panel of CRW by opening the cover). If tripped, reset it. If succeed, work the train normally.

2. If still un-successful, open the CRW panel cover, put cab occupied selector switch from 11 o'clock to 1 o'clock position (from circuit N to circuit O) this called over ride mode/ high priority mode). Also check the MCB No. GC F-2 (must be in set condition). Work the train normally.

3. If still unsuccessful try to work train in RDM.

This is for your information and necessary action.

3.3.12 Sub.: 90 days safety drive on Precaution to be taken during Foggy Weather.

3.3.12.1 3.3.12.1 No.ELS/ 6/7

Sealdah, dated. 06.11.2019

Ref i) Rly Bd's Letter No. 98/Safety (A&R)/19/16 dated 22.11.17.

ii) PCSO/ER/KKK's L/No.TA.5/61/9/Pt.XVIII, Dt-30.10.2019

iii) Sr.DSO/SDAH's L/No. TS/S/Safety Drive/Divn/28/2019, dated: 04.11.2019

Vide letter under reference (ii) & (iii) a 90days safety drive is to be launched with immediate effect regarding precautions to be taken during foggy weather

Precautions by Loco Pilot:-

The Loco Pilot shall take action in regard to speed of the train during fog as under:-

i)	During fog when the Loco Pilot in his judgment feels that visibility is restricted due to fog, he shall run at a speed at which he can control the train so as to be prepared to stop short of any obstruction; this speed shall in any case not be more than 60kmph.
ii)	Loco Pilot to whistle frequently to warn the gateman (where provided) and road users of any approaching train at all manned & unmanned level crossings.
iii)	In absolute block system the speed should not exceed 60 Kmph as detailed at item (i) above.
iv)	In automatic Block Territory the speed will be subject to the judgment of the loco pilot as mentioned in item (i) above and shall not exceed as under:-

a)	After passing Automatic Stop Signal at ' Green ', the speed not to exceed 60 Kmph .
b)	After passing an Automatic Stop Signal at ' Double Yellow ', the speed not to exceed 30Kmph .
c)	After passing an Automatic Stop Signal at Yellow Loco Pilot to run at a further restricted speed so as to be prepared to stop at the next Stop Signal.
d)	After passing an Automatic Stop Signal at ' ON ' (Red), the LP/Motorman of the train/EMU/MEMU/DEMU shall move at a speed not exceeding 10 Kmph . He should also ensure that he maintains a reasonable distance at which he is able to observe the flashing tail lamp of the ahead or the obstruction .
v)	Intensive Counseling of Loco Pilots should be done. Record of such counseling should be maintained in the Crew Booking Lobbies as well as with the CLIs in a separate Register.
vi)	Never Book any LP/ALP/Guard who is due for PME, Refresher or Safety Course.
vii)	To monitor whether the loco pilots are following prescribed speed limits, report of over speeding, if found any to be submitted immediately with speedometer analysis data. Instruments have been given for conducting Ambush Checks.

3.3.13 Sub: Winter preparedness drive

3.3.13.1 No. ELS/6/11 Sealdah, dated 08.11.19

Ref: RB's Letter No. 2005/Elect. (TRS)/440/23 dt.11.10.19

Subject under reference, the important pre-Winter precautions mentioned in ACTM Para 30514 and related instructions issued by RDSO are reiterated as follows-

- During all trip inspections or roof inspections whenever carried out, proper cleaning of roof –line & pantograph insulators with a wet & dry cloth for maintaining shining surface finish may be ensured. Instructions laid down in RDSO SMI No. RDSO/2012/EL/SMI0274, Rev.0, dated. 29.03.12 may be ensured.
- Ensure joint checking of loco roof equipments (including pantographs, cleaning of roof insulators and roof bar etc.) with TRD staff at trip shed as preventive measure.
- Modification in mounting bracket of fixed contact and movable contact arm of HOM switch to increase the electrical clearance issued by RDSO vide RDSO/2012/EL/MS/0405 (Rev 0) dated 03.01.2012.
- Re-greasing of pantograph servomotor to avoid jamming.
- Working of heaters / blowers in both cabs.
- Air tightness of cab main doors, window shutters and sealing of ventilator covers.
- Proper level of oil to be maintained in TFP, GR and Traction Converter.
- Good condition of silica gel for Transformer, Tap changer and Traction Converter.

- Air dryer must be in working order and isolation should not be permitted.
- Proper level of oil to be maintained in compressors and ensure that un-loaders are in working order.
- Draining of moisture from all MR and free movement of drain cocks.
- Availability of dry sand in all sand boxes and all covers must be air tight.
- TM inspection covers to be provided with gasket and ensure no air gap & locked properly.
- Cleaning of battery terminals and application of petroleum jelly.
- Free movement of brake cylinders, if found sluggish than overhauling should be done.
- SMGR servomotor cylinders to be cleaned and re greased.

It is hereby advised to open a register and maintain the checked items on the above points during the winter season and to be sent to this office for onwards transmission to HQ.

3.3.14 Sub: Counseling regarding putting signature and name with time

3.3.14.1 No. EL OP/6/11

Sealdah, dated 13.11.19

Ref: 1) Sr.DOM/SDAH' inspection note no.TG/Insp/Sr.DOM/19 dated 15.10.19.

2) Sr.DOM/SDAH' inspection note no.TG/Insp./Sr.DOM/19 dated 18.10.19.

Counseling regarding putting signature and name with time instead of initials on receipt copy of T-369(3b)

During inspection of BNJ & NH stations on 15.10.19 & 18.10.19 respectively, by checking copies of T-369(3b) by Sr.DOM/SDAH, it was observed that most of the LPPs are putting only initials without time of receiving it. You are advised to counsel all the LPPs under your roll to get rid of this mal practice and put signature and name with time so that the name of the LPP and time can be read in case of any enquiry in future. CCCRs are also advised to display a notice in the lobbies of their respective control for mass display among the running staff.

[*Recurrence of this mal practice, in future, will be viewed seriously]

4 APPRECIABLE & FAILURE CASES

4.1 APPRECIABLE CASES

4.1.1 Appreciable Case-1, Good work done by Sri Debabrata Mondal – III/LPP/SDAH

4.1.1.1 No. ELS /1/3(Rg)

Sealdah Date: 19.06.19

Ref: Wrong route for train no. - 33630 at KGK DN MN Home signal on date 16.06.2019.

On 16.06.19 while Sri Mondal was working (concerned CLI-Jayanta Kundu) Tr.No.33630; when train was approaching near DN Main Line KGK Home signal, LPP observed that the route indicator was wrongly given for DN Chord line i.e. KGK

- BLN chord line instead of towards SDAH. After observing it, LPP stopped the train before foot of the said Home Signal and informed to the working guard of the train, concerned CLI & on duty TLC for necessary action. After stopping there for about 4 minutes he got right signal for his train and started the train with guard's starting signal.

Thus Sri Debabrata Mondal-II, LPP has saved the train against an abnormal incident. This was possible due to his sincerity and devotion towards duty and high alertness. In view of performance which shown by Sri Mondal considering his dedication on duties with high alertness.

Bio-data of Sri Mondal is furnished as under –

S.N	Item	Remarks
1	Name in full	Sri Debabrata Mondal-II
2	Designation	Loco Pilot Passenger
3	Department	TRS/Electric (Operation)

4.1.2 Appreciable Case-2, Good work done by Mrs. Soumita Roy/LPP/NH

4.1.2.1 No. ELS /1/3(Rg)

Date: 26.09.19

Ref: Wrong route for train no. – 31325 Up at KYI up Main Home signal on 21.09.2019.

On 21.09.19 while Mrs. Soumita Roy (concerned CLI–Bhabatosh Bhowmik) was working train no. – 31325 UP stopped her train before KYI UP MN Home signal (S-1) being at ON at 14:05 hours. At 14:07 the said signal was taken OFF with wrong route (Yellow + DRI for PF No. 1 instead of nominated PF No. 4). LPP Mrs. Roy did not move and informed working guard about the fact. The signal was put back to ON and again OFF with proper route to PF No. 4 for KYI local at about 14:11 hours. On exchanging signal with guard Mrs. Roy started the train. On duty TLC/P submitted a memo to Dy. CHC intimating the fact. Thus Mrs. Soumita Roy, LPP has saved the train against an abnormal incident. This was possible due to her sincerity and devotion towards duty and high alertness.

As per model SOP Honorable DRM is empowered to grant cash award up to Rs.7500/- in such cases. In view of commendable performance shown by Mrs. Roy, considering her dedication to duties & high alertness, she is recommended for such award. Bio-data of Mrs. Soumita Roy is furnished as under –

S.N.	Item	Remarks
1	Name in full	Mrs. Soumita Roy
2	Designation	Loco Pilot Passenger
3	Department	TRS/Electric (Operation)

NB: Recommended for award accordingly for both LPP

4.2 FAILURE CASES

S.N	Date	Detail of incident	Remarks
1	04.07.19	Train No. 33824. LPP failed to stop the train at proper position i.e. just before the EMU Stop Board of BZRA station. Train stopped just after passing about 3 & ½ coaches.	PF entering speed should be 40 kmph mid of the station 20, before stop board 5 kmph
2	18.06.19	Train No. 33523. LPP failed to stop the train at proper position i.e. just before the EMU Stop Board of KMZA Station. Train stopped after passing about a distance 683 m.	PF entering speed should be 40 kmph mid of the station 20, before stop board 5 kmph
3	30.10.19	Train No. 31634 Dn. After departing CDH station, LPP failed to stop the train at PXR station and through passed. Train stopped at SMX station.	Keep always WTT & galloping chart open condition on driving desk, confirm with guard with adequate distance with talkback for galloping Tr.
4	04.11.19	Train No. 34822 Dn. After departing BLN station, LPP failed to stop the train at JDP station and through passed.	Keep always WTT & galloping chart open condition on driving desk. Confirm STOPAGE with guard through talkback in adequate distance for galloping Tr.

5 SPECIAL INSTRUCTIONS FOR PREVENTION OF SPAD

5.1 INSTRUCTIONS FOR MOTORMEN OF EMU/MEMU

SL.NO	DO	WHY YOU WILL DO
AT HOME		
1	Take Proper Rest At Home	You will be energetic and will be full attended on your job to give a good performance
IN YOUR LOBBY		
2	Do On Duty At Right Time	Do On Duty At Right Time With proper uniform caring with badge. It help you to avoid unusual occurrence
3	Do BA Test	To prove you are not influenced by alcohol's
4	Read All Safety	Read All Safety Notices And After Clear Under

	Notices	Standing Sign On It (If not understand ask to your immediate Boss or CLI) in this way you must be updated with latest all safety circular which was published in your notice
5	Read Caution and Mark On it	It helps you on run to avoid SPAD. When You Stand On A Stopping Station Read Caution Up To Next Stopping Station And Again tick Mark On It. Do Not Read Caution On Run By Passing Signal.
6	Open working train page on Time Table & mark	Open Time Table And Note All Stopping Station Over Caution Paper from your WTT to Avoid Over Shooting of stopping station
ARRIVED ON CAB BEFORE 15 MIN FROM DEPARTURE.		
7	Read log book, Check All Safety Items & Do BP Cont. Test With GD & Make Your Destination Board.	Read log book properly, Check All Safety Items including DEADMAN & Do BP Cont. Test With GD to ensure the continuity of BP pressure for application of AUTO brake in your full train , Make Your Destination Board., put your ID in speedometer, book abnormality on log book if found & Relay To TLC From Your CUG Phone
8	Display On D/Desk- WTT Caution order, flags, signal chart , galloping chart	Display On Your Driving Desk before departure- WTT, Caution Order which you marked (don't keep old caution order on desk),2Red/1Green Flag / Tri Colour Torch, Signal Chart, Galloping Chart for galloping train to avoid unusual occurrence.
9	Sw. Off Your Mb Ph. & Keep It On Line Bag	On run you must sw. off your phone to avoid other disturbance and concentrated your mind on your job perfectly
10	Do not take un authorised man on driving cab	To avoid unwanted gossiping it may be diverted your mind and lead to SPAD
11	Relay to GD About Your "ON" Aspect of Signal.	Relay To GD About Your "ON" Aspect of Signal at dep. Point and en-route. It will remind you the DANGER ASPECT of signal to make alert yourself. On run to prevent SPAD.
12	Acknowledge Your Gd. Starting Bell	Acknowledge You're Gd. Starting Bell after confirming "Off" aspect of own signal, (Put On Awls), Then Blow Horn, Throw Rev.-Forward, & Take Notch follow all in a sequence

ON RUN

13	** If You Start With Calling "On"(In front of RRI stop signals S-10/S-11/S-12/S-13 All are on LEFT side)	i) put ON AWLS to observed proper speed and be prepared to stop your train short of any obstruction ii) observe all points properly set & lock in desired direction iii) line not occupied on that route by other vehicles iv) Rail line not fractured v) and next main signal may be red
14	Do Brake Feel Test	After starting from originating station do BFT by AUTO brake with proper speed (10-15 kmph) to confirm just your AUTO brake system working
15	Do Brake Power Test	After achieving 40 kmph do BPT by AUTO with application by 1.5 kg/ cm. sq one time on brake cylinder gauge to reduced speed up to 20 kmph to assess the brake power of the train
16	Apply Auto Brake At First Stopping Station	You must apply AUTO BRAKE at first stopping station to be acquainted with application of auto brake.
17	Put on AWLS over diversion or SR	It has two side one in tech and another on safety , technical side means it cut the notch after SH power but it not regulate the speed of the train and another one it give a message alert to you by light or by sound , or by both that you are a under speed restriction . Then your attention to observe the speedometer frequently that you are not exceeds speed.
18	Keep Always A Sharp Look Out	On run you must be very cautious about your signal with arrow head till it pass, track, and station by name you passing, level crossing gate, unauthorised tress passing for your safe journey.
19	Self call out for motor man	To prevent SPAD Motor man must self call out all signals taking station name, signal name and aspect (for automatic signal & gate with number).Your unconscious mind will be switch over on truck from other thought.
20	Blow intermittent horn over LC Gate	It does more alert the road user about running train on level crossing from both ends.
21	Follow all SR Properly	To prevent derailment/LOR of a running train on SR zone You must run your train with

		proper speed (on SR if you run your train with less speed it is also one kind of LOR).
22	Train run with maximum permissible speed	You are serving the Nation by your job. Our Nation expectation the movement of train will be in right time. So it is a part of your responsible job to run the train in right time.
23	Control your train on yellow aspect	To prevent SPAD you must control your train on yellow aspect and your speed should be such as your train must be stop before DANGER aspect.
24	Be alert on N/S	Trip /close unit in proper indication board In every N/S & you must be alert after tripping DJ that BA Voltage available on cab voltmeter.
25	Don't Put Reverser On Middle On Run	It is a safety item for M/M (due to single man job). It Prevent An Accident In Case Of Motor Man When Became conscious (So Dead Man Isolating Cock Must be In Service)
26	Keep Doors Close On Run	It Is Your Own Safety. Any Incident May Be Happened By Miscreant & Pelting Of Stone From Out Side or you may fall down from cab on run
27	PF Entering speed	PF Entering speed not more than 40 KMPH for stopping train and before 20m from stop board speed should be 5kmph in all terminating station
28	Exchange GD bell for through pass train	For galloping train LPP must exchange all right (o-o) bell before passing a station and he must confirm with GD with talk back just rear with an adequate distance from next passing station in EMU/MEMU service
29	When Poor Visibility Of Signal On Curve	Mind It, visible distance of truck = braking distance of your train. So pre-calculate the safe speed to stop before danger signal

ON DESTINATION

30	Pack your belongings AFTER arrival at destination	If you engage on run to pack your belongings you may be pass your DANGER signal or any other danger indication given by station staff.
31	Do BP Pressure-'0'	Destroy your BP pressure up to zero at your destination for prevention of roll down
32	Open BL Key	Open your BL Key by two hands.

6 TECHNICAL DISCUSSION

6.1 CONVENTIONAL EMU/MEMU

6.1.1 Conventional Emu- Operation of Jumper A B C D E

Electrical Coupling: - Jumpers (Each coach provided with 4 jumpers five jumpers in JESSOP made Unit)

Jumper - “A”: - Control supply (110V. D.C) **Pantograph& ABB control, MCP (Main compressor) control**, EP (Electro Pneumatic) brake Control, Fan supply.

Jumper – “B” :- Traction control circuit , Light & fan supply, Parking brake supply, In case of MEMU Control change over & MCP synchronizing supply.

Jumper - “C”: - Indication circuit, Signal Bell, Light supply and in case of EMU Control change over & MCP synchronizing supply.

Jumper - “D”:- Guards supply, Light & Fan Control supply, Head light (for same unit), Emergency Head Light, Tail light, Light & Fan Supply. Each jumper contains 19 nos. of core insulated wires.

Jumper - E: - Entertainment (In JESSOP made unit).

6.1.2 How GPS Base PIS and Head Code Can Set In Conventional EMU

DRIVER END



GUARD END (DONE BY GD)



1. LONG PRESS “0” KEY
2. LONG PRESS “#” KEY
3. PRESS RIGHT KEY (>)
4. USE PASS WARD “1111” AND PRESS # KEY
5. ENTER TRAIN NUMBER AND PRESS # KEY
6. ENTER” CAB TYPE” “1’ FOR GUARD “2” FOR M/M AND PRESS # KEY
7. LADIES SPL. “1” FOR “NO” “2” FOR “YES” AND PRESS # KEY
8. ENRER “COACH NO.” AND PRESS # KEY
9. ENTER “SLOW” OR “FIRST” “1” FOR SLOW AND “2” FOR “FIRST” AND PRESS # KEY
10. ENTER”PH” COACH 0 FOR “NO” “1”FOR YES AND PRESS # KEY TWO TIMES

6.1.3 How You Can Identify PIS Setting End

1. ONE BRIGHT **GREEN** LAMP & ONE **RED** LAMP WILL BE GLOW ON THAT UNIT FROM WHERE IT SET.
2. ONLY ONE BRIGHT **RED** LAMP WILL GLOW ON ANOTHER END.

6.2 THREE PHASE EMU

6.2.1 Pneumatic Troubleshooting-

6.2.1.1 Attention Brake binding on Bursting of MR. & BP Hose Pipe

Trouble: BP leakage from hosepipe.

Indication:

- BP pressure will not charge up to 4.7 kg/cm^2
- Full train auto brake binding
- On HMI EBL triggered.(full EP brake applied in whole rake if motor coach BP gets lower than 3.4 kg/cm^2)

6.2.1.2 Action has to be taken by Motor man.

- Close BPIC on both sides of the affected hosepipe.
- Isolate brake binding of rear 'C' (Trailer) coach if hosepipe leakage is between last two coaches.
- Charge BP from Guard's cab, /nearest shunting cab, inform guard about brake pipe discontinuity & remind the emergency.
- Work the train at restricted speed, work as per competent authority.
- Inform TLC to call maintenance.

6.2.1.3 MR Leakage on hose pipe

Indication: MR pressure dropping continuously.

Action: Try to manage by putting on "START ALL MAC", if success, clear block section.

- In convenient place, Close MRIC on both sides of the affected hose pipe.
- Work normal (MAC management will adjust themselves)

Inform TLC for arrangement of maintenance staff.BP continuity test by SB-2 Baton &brake binding release from 'HMI'

[N.B.: Speed will be reduced to 60 kmph Due to non availability of air pressure in bellow]

6.2.1.4 BP - continuity test by SB-2

SB-1 works on software base it active after cab occupation.

In RDM operation SB-1 does not work or fails,

Continuity test with guard can be done by SB-2 which is hardware operated, always active. Ensure JD F-4 MCB is set

6.2.1.5 How different Brake binding can release from 'HMI'

Isolation of Brake binding in one coach -

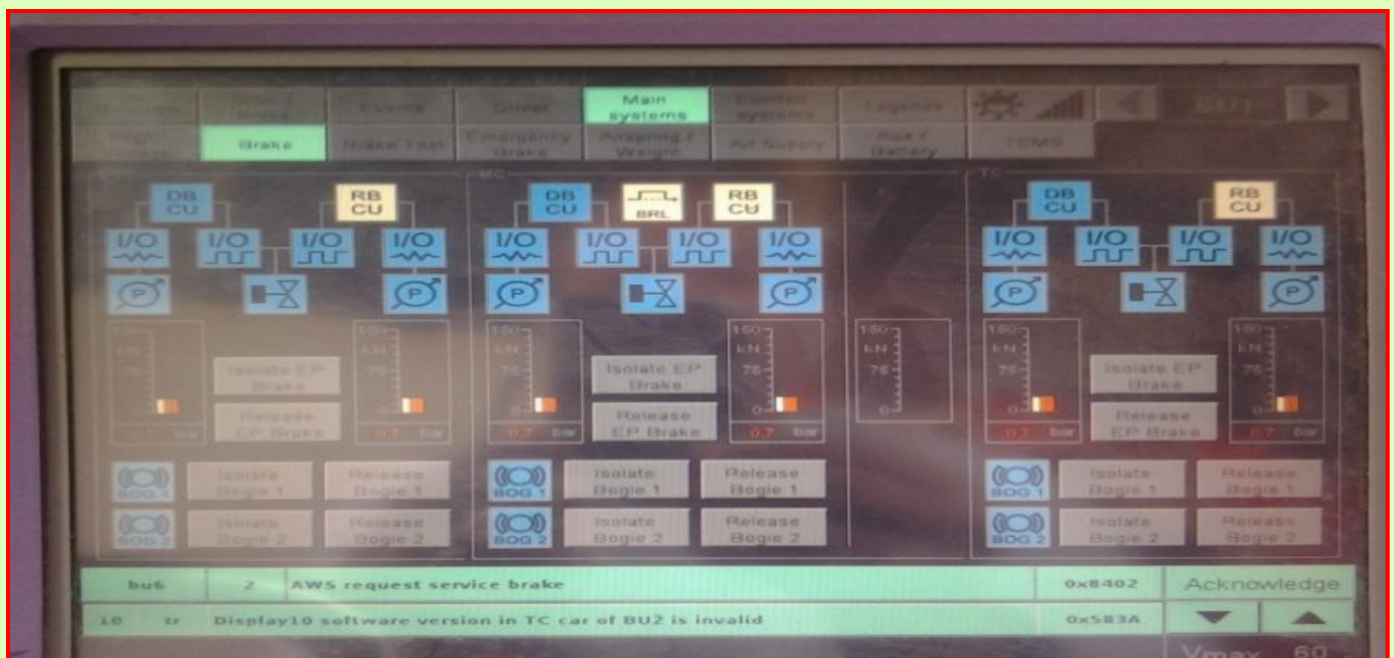
Cause: Brake unit defective **Indication:** Brake applied indication on HMI.

Action to be taken

- Identify the affected coach on HMI. Ensure parking brakes are released.
- Select the concerned unit on HMI to ensure that there is no 'Unit Brake binding'.
- Apply and release EP 2-3 times and check on HMI whether brake binding is released.
- If brake binding does not release, try to isolate EP brakes of the affected coach from HMI. Conduct Brake power test on run and work accordingly.
- Adopt following procedure if still brake binding does not release:

For leading/trailing 'C' coach

- Close EP and Auto cocks.
- Pull release wire till hissing noise stops. Do not close bogie cocks.
- Ensure brakes are released on all wheels of the affected coach.
- Open Auto cock once and check whether brake binding takes place or not.
- If brake binding does not take place, work on auto brakes & call EXR.
- Conduct brake power test on run and work accordingly.
- If brake binding takes place again, isolate again with the above procedure and close bogie cocks.
- Work the train at restricted speed and cancel the train at first available platform. Back it to nearest yard or car shed.



For intermediate coaches

- Close EP and Auto cocks.
- Pull release wire till hissing noise stops.
- Ensure brakes are released on all wheels of the affected coach.
- Close bogie cocks.
- Conduct brake power test on run and work accordingly

Note: If the brakes are not releasing on any of the wheels, it may be due to defective brake cylinder, delayed release etc. Cancel the rake at first available platform and back to the nearest yard/shed.

6.2.1.6 Parking brake binding:

Causes:

- Parking Brake applies command given from DTC, MC or Guard's cab.
- MR Pressure less (less than 2 kg/cm²).
- Parking brake MCB (GC-15) in one or more C coaches may be tripped
 - Parking brake Cock close under one or more C coaches.
- Parking Brake Magnet Valve de-energised.

Indication:

- Parking brake gauge may show zero pressure.
- Parking brake applied symbol will appear on HMI for one or more C coaches.
- PB apply push button may show blue colour backlight steady.

Action:

- Release the parking brakes by pressing the 'parking brake release' push button in D/Cab and observe parking brake status on HMI, parking brake gauge.
- If not successful, apply parking brakes again, wait for 3-5 sec. and again release by pressing 'parking brakes release' push button.
- Ensure all MCBs are 'set' in DTC. (Especially parking brake MCB) If parking brake MCB is found tripped, reset the same. Apply and release parking brakes once and ensure that blue light 'Apply Push Button' is extinguished.
- If Parking Brakes are still not releasing, isolate parking brake of affected coach by pulling the release wires provided on the bogie near dashpot spring and hook it properly (near wheel nos.1, 3, 5 and 7)
- Inform EMU (C) and call EXR

Note: Parking brakes can only be released from Driving cab where master key is switched ON but can be applied from any Driving cab/Motor coach without inserting and putting master key 'ON'. When the parking brakes are applied from motor coach, Parking Brakes will be applied only in the C- coach of the concerned unit.

6.2.1.7 Brake binding in one unit

Indications: Train moves sluggish or may not move.
 Brake applied indication on HMI for all three coaches of one unit.

Action:

- Identify the affected unit with the help of HMI.
- Apply and release full EP 2-3 times and check whether brake binding gets released.
- If not successful, isolate EP brakes of all three coaches of affected unit from HMI.
- Ensure that brakes on all wheels of all three coaches are released.

- Work the train normal on auto brakes.
- If not successful, inform EMU(C) & call EXR
- EXR shall trip EP UNIT MCB in all three affected coaches and ensure that EP brake binding is released.

6.2.1.8 Auto Brake binding in full train

Due to under charging of brake pipe

Reason: Reducing valve defective in driving cab.

Indications

- Duplex gauge will show less BP pressure with no leakage anywhere.
- Brake Cylinder pressure gauge will show full / partial brakes.
- EBL-3 will activate emergency (full EP) brakes throughout the train if BP pressure is less than 3.4 kg/cm².
- On RHS panel, min.1 brake applied indication.

Action

- Isolate AWS.
- Ensure MR pressure is normal.
- Operate ICS two to three times. If BP pressure becomes normal, work the train & call EXR.
- If still train refuses to move then switch off ICS.
- Charge the BP fully from Guard's cab & switch ON ICS in DTC again.
- Cancel the train at first available platform & back it to the nearest yard/car-shed.
- Inform EMUC & call EXR.

6.2.1.9 Overcharging of brake pipe (more than 5 kg/cm²)

Cause: Reducing valve defective in driving cab.

Indication:

- Duplex gauge will show more BP pressure.
- If subsequently reducing valve becomes normal & charges BP to 4.7 kg/cm², it will cause Full train brake binding on application of Auto/EMG brakes
- After changing the Driving cab at destination it will cause full train brake binding when BP is charged through ICS to 4.7 kg/cm² as Auxiliary reservoir is already charged more than 5 kg/cm².

Action:

- Isolate AWS.
- Work the train normal on service brakes. Keep watch on BP pressure.
- If auto brake binding takes place adopt following procedure,
- Apply EP brakes 4-5 times through PBC. If brake pipe pressure becomes normal & if brake binding gets released, work the train normal. Inform EMU Controller immediately. Call for EXR.
- If brake binding still persists, release brake binding of each coach by pulling release wire till hissing noise stops. Ensure brakes are released. Do not close bogie cock or any other cock.
- Work the train normal. Inform EMU Controller & seek his advice. Call for EXR.

6.2.1.10 Full Train Auto-Brake Binding

- EBL triggered message on HMI.

Action:

- Ensure BP leakage by switching OFF ICS.
- If BP leakage is noticed, keep ICS 'ON' in DTC.
- Close BPCC on both sides of the affected coach.
- Isolate brake binding of the affected coach.
- Charge BP from Guard's cab, inform Guard about BP discontinuity and remind him the emergency bell code 00-00-00.
- In case of motor coach, operate EMG BRAKE LOOP BYPASS SWITCH in both the cabs to 10'clock position to isolate emergency brake loop (EBL).
- Work the train at restricted speed, cancel it at the first available platform and back it to nearest yard or car shed.

6.2.1.11 MR Leakage on hose pipe

Indication: MR pressure dropping continuously.

Action:

- Close MRCC on both sides of the affected hose pipe.
- Work normal.
- Inform EMU(C) & call EXR.

6.2.1.12 MR leakage under frame

a) Trouble: MR leakage from under frame of 'A' coach.

Indication: MR pressure dropping continuously.

Action:

- Close MRCC on both sides of the affected coach.
- Work at the speed not more than 60 kmph up to destination only. (Air suspension coaches)
- Inform EMUC & call EXR.

b) Trouble: MR leakage from under frame of 'B' coach.

Indication: MR pressure dropping continuously.

Action:

If Escorts Knorr brake controller is provided

- Close MRCC on both sides of the affected coach.
- Isolate the affected Basic unit from DTC.
- Work at the speed not more than 60 kmph up to destination only. (Air suspension coaches)
- Inform EMUC & call EXR.

If Westinghouse brake controller is provided

- Close MRCC & BPCC on both sides of the affected coach.
- Isolate brake binding of motor coach. If it is rear 'B' coach, isolate brake binding of adjacent 'C' coach also.

- Charge BP from Guard's cab. (Except in case of rear B coach)
- Inform Guard about discontinuity of BP and remind emergency bell code 00-00-00.
- Isolate the affected Basic unit from DTC.
- **Operate EMG BRAKE LOOP BY-PASS SWITCH in both the cabs** to 10'clock position to isolate emergency brake loop (EBL).
- Work the train at restricted speed and cancel it on the first available platform. Back it to nearest yard/car shed.

c) Trouble: MR leakage from under frame of 'C' coach.

Indication: MR pressure dropping continuously.

Action: Air leakage before MR main cock (between Main compressor and MR main cock)

- Close MR main cock and isolate main compressor from HMI.
- If not successful, call EXR to isolate main compressor and governor.

Air leakage after MR main cock--In case of leading 'C' coach

- Close MRCC & BPCC between leading C & B coach.
- Isolate brake binding of leading C coach.
- Isolate parking brake of the leading C coach.
- Switch OFF ICS and DCS in DTC. Charge BP from Guard's cab.
- Inform Guard about discontinuity of BP and remind emergency bell code 00-00-00.
- Isolate main compressor from HMI or take the assistance of EXR to switch off main compressor.
- Switch ON ICS and DCS in DTC. Work the train at restricted speed and cancel it on the first available platform. Back it to nearest yard/car shed.
- Inform EMUC.

Air leakage after MR main cock --In case of Rear 'C' coach

If Escorts Knorr brake controller is provided:

- Close MRCC between rear C & B coach.
- Isolate parking brake of the rear C coach.
- Isolate main compressor from HMI or take the assistance of EXR to switch off main compressor.
- Work the train up to destination with speed not more than 60 kmph. (Air suspension)
- Inform EMUC.

If Westinghouse brake controller is provided:

- Close MRCC & BPCC between rear C & B coach.
- Isolate brake binding of rear C coach.
- Isolate parking brake of the rear C coach.
- Isolate main compressor from HMI or take the assistance of EXR to switch off main compressor.
- Work the train at restricted speed and cancel it on the first available platform. Back it to nearest yard/car shed.
- Inform EMUC.

In case of intermediate 'C' coach,

- Close MRCC on both sides of the affected coach.
- Isolate parking brakes of the affected 'C' coach Isolate main compressor from HMI or take the assistance of EXR to switch off main compressor.
- Work the train at speed not more than 60 kmph speed up to destination only. (Air suspension)
- Inform EMUC and call EXR.

6.2.1.13 BP leakage on hose pipe

Trouble: **BP leakage from hosepipe.**

Indication:

- BP pressure will not charge
- Full train auto brake binding
- On HMI EBL triggered.

Action:

- Close BPCC on both sides of the affected hosepipe.
- Isolate brake binding of rear 'C' coach if hosepipe leakage is between last two coaches.
- Charge BP from Guard's cab, inform him about brake pipe discontinuity & remind the emergency bell code 00-00-00.
- Work the train at restricted speed, cancel it at the first available platform and back it to nearest yard or car shed.
- Inform EMUC and call EXR.

6.2.1.14 BP leakage under frame

Trouble: **BP leakage under leading 'C' coach.**

Indication:

- BP pressure will not charge.
- Full train auto brake binding.
- EBL triggered on HMI.

Action:

- Close BPCC & MRCC between leading C & B coach.
- Switch OFF ICS and DCS in DTC. Charge BP from Guard's cab, inform him about brake pipe discontinuity and remind him the emergency bell code 00-00-00.
- Isolate brake binding of the leading C coach
- Switch ON ICS and DCS in DTC. Work at restricted speed and cancel the train on the first available platform. Back it to nearest yard or car shed.
- Inform EMUC & call EXR.

6.2.1.15 BP leakage under intermediate coach

Trouble: **BP leakage under intermediate coach.**

Indication:

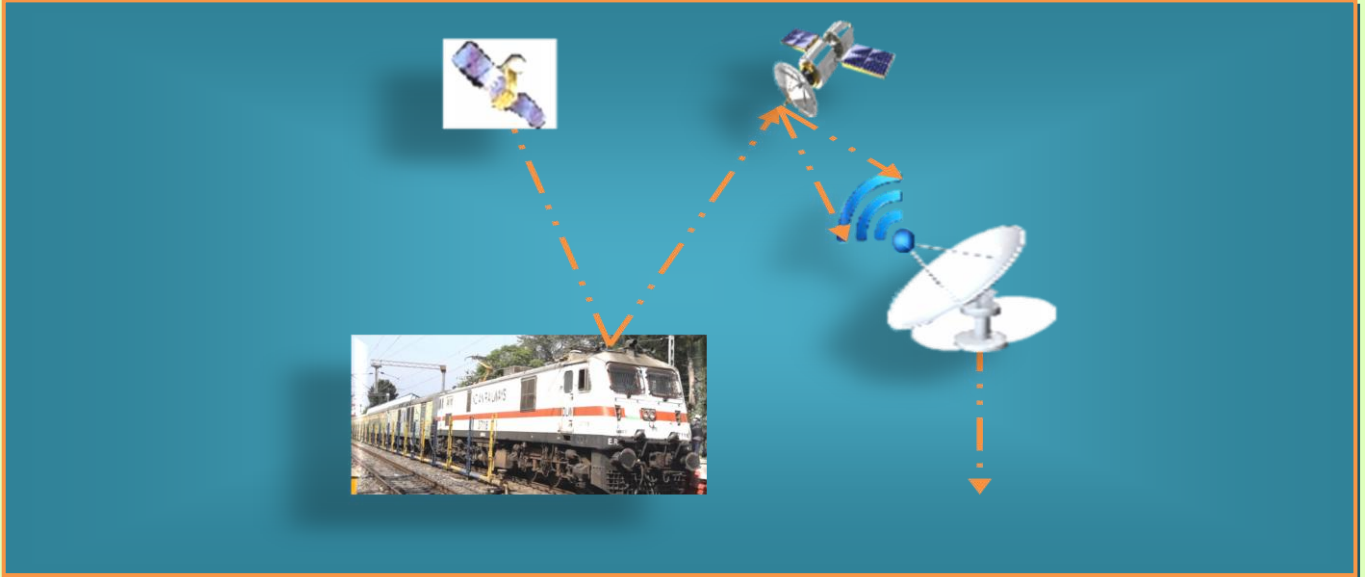
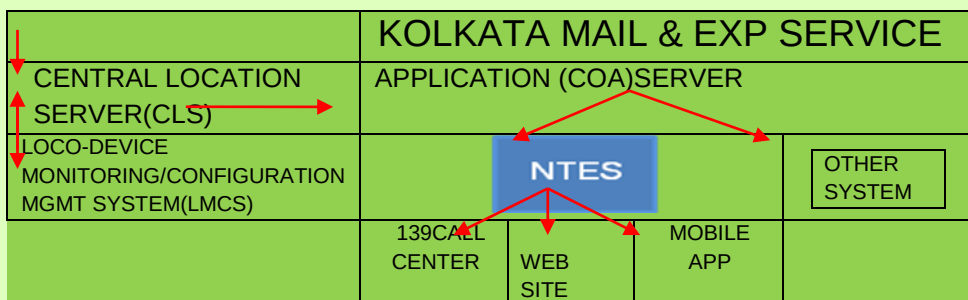
- BP pressure will not charge.

6.3 CONVENTIONAL LOCO

6.3.1 Brief of Project: RTIS

1. RTIS(Real - Time Train Information System) is developed for automatic acquisition of
Train movement data
- 2 Loco Device used under the project will be installed on the LOCO motive

6.3.2 System Architecture GPS



6.3.3 Why RTIS:

1. Automatic acquisition of train movement data feed to COA for automatic control chart platting and improve train controls functions
2. Emergency messaging from loco pilot to control room
3. Accurate information to passenger s regarding train movement delivered as a by-product since COA is already integrated with National Train Enquiry (NTES)

6.3.4 About RTIS -

1. The contract for development of RTIS for Indian Railways is awarded to Bharat Electronics Limited Centre for Railway information system [CRIS]
 2. CRIS New Delhi has placed order on BEL for supply of 2835 no of loco devices and network infrastructure
- * Quantity 2700 number of LOCO devices will be Installed at 21 different LOCO shade as per tender where are 135 number of loco devices will be kept as spares

6.3.5 System Components

OUTDOOR UNIT [At Loco Rooftop]

INDOOR UNIT [Inside the Loco Cabin]

6.3.6 RMT: Rail MSS Terminal

Outdoor unit [RMT] Comprises of following

1. Models satellite service MSS transceiver module
2. Secondary GPS receiver
3. Antennae for all modules (that is MSS, GPS, 4G1, 4G2&Zing-Bee)



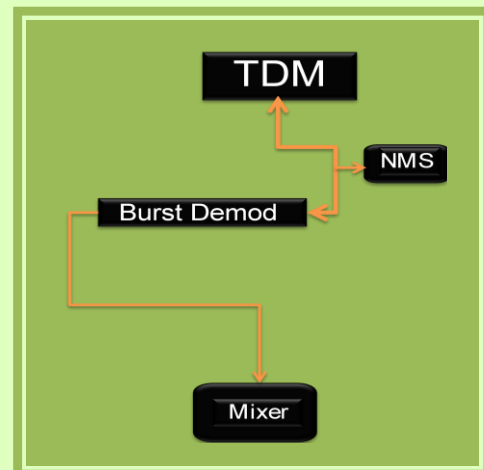
6.3.7 IRN: Indian rail Navy Equators

1. Comprises following components.
2. DPE Display processing engine.
3. CM integrated communication module.
4. PMU Power management unit

6.3.8 DPE: Display Processing Engine-1

IT CONSISTS THE FOLLOWING:

- OPERATING SYSTEM : RHEL7.6
- PROCESSOR : Intel Base 64 bit
- Quad Core 1.5Ghz
- DISPLAY AREA 217(H) *135.6 (V)
- RESOLUTION :1280(H) *800 (V)



6.3.9 DPE: Display Processing Engine: -2

1. GRAPHICS: Intel HD Graphics
2. MEMORY 4GB expandable up to 8GB
3. POWER SUPPLY L: 12 volt @2.5 A (Max)
4. POWER CONSUMPTION: 24 w (Max)
5. DISPLAY SPECIFICATION: 10 .1 INCH



6.3.10 ICM

Integrated communication module

It consists of the following:

Two 4G modules, One GPS,
One Zing- Bee Modules

6.3.11 PMU: Power management unit

1. INPUT: 50-150 V DC 2. O/P1: 12 V. DC/4
3. O/P2: 12 V. DC/4 A
4. OPERATING TEMPERATURE: -10°C to $+55^{\circ}\text{C}$

Locomotive device; HUB broadcast the message.

Locomotive device gates in coordinates through

GPSS- band/ C- band transponder on GSAT series satellite and MSS hub including NMS hardware and software located in CRIS data centre in New Delhi and 4G/ 3G network of mobile service providers

Central location server is CLS along with application software in CRS DC and its interface with COA

Hardware and software for Loco device monitoring and configuration management [(LMCS)]

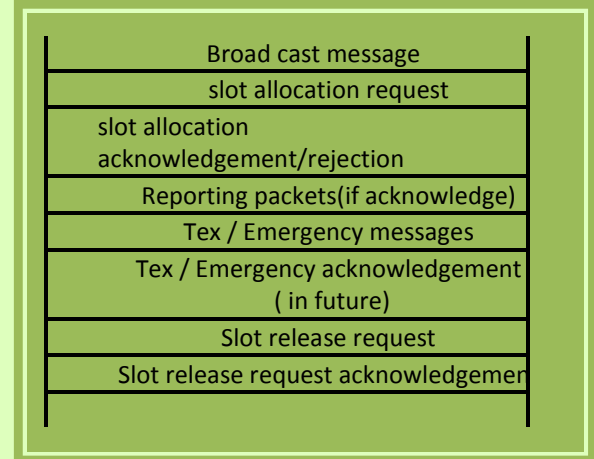
6.4 RTIS WORKING PROCEDURE ISRO ANTENNA AT DES



TOUCH SCREEN: RESISTIVE SIGNAL FLOW GRAPH

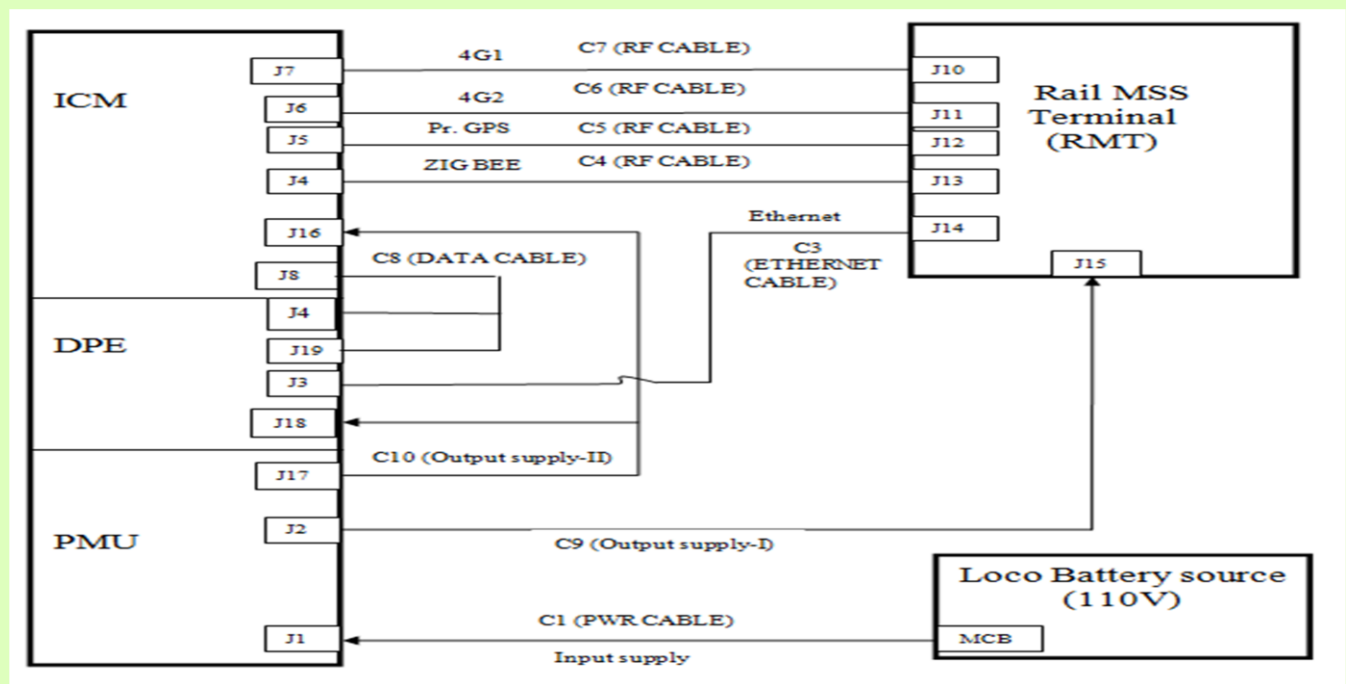
HUB

IRN



- Step 1 HUB sends the Broadcast messages every predefine defined time interval
- Step 2 Locomotive receives the Broadcast message and requests the slot to NMS
- Step 3 HUB receive the slot request and give slot based on the train ID number with the Help of CLS and LMCS
- Step 4 Locomotive receive the slot allocation and starts sending the GPS position in a allocated time interval
- Step 5: Running status running state, where reporting, messaging, etc... Will happen

6.4.1 System Architecture



6.4.2 MAJOR TASK:

- 1 Communication over 2G/3G/4G
- 2.GPSreception
- 3.Communication over Zig-Bee (Future Scope)

6.4.2.1 How LP Sign On With “RTIS” Base Loco

STEPS TO OPERATION :(Indian Rail Navigator) through GUI

1. Tap on RTIS IRN screen to wake up it. If it does not wake up, check the RTI MCB. It should be on.

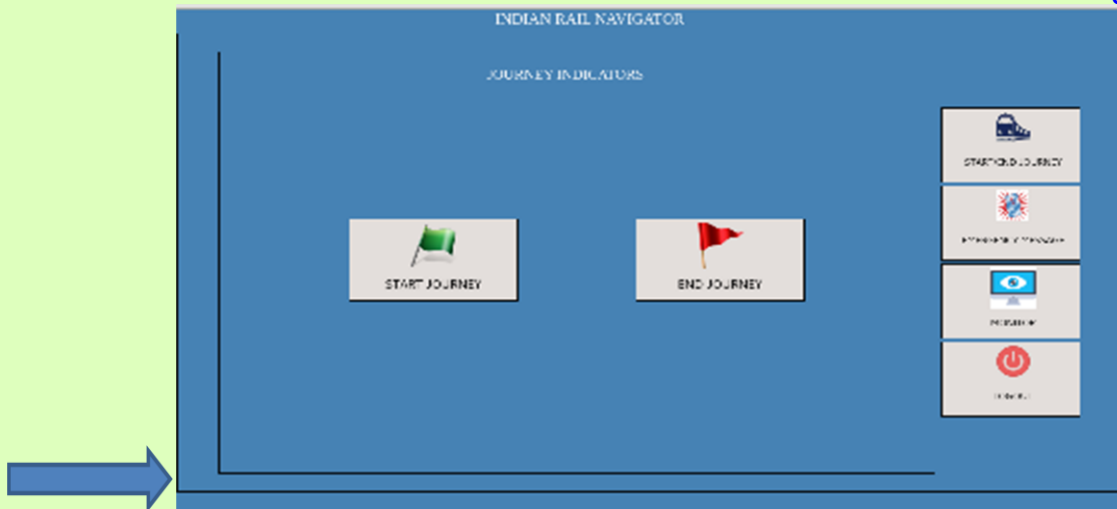
2 Enter the user ID and password to login for loco pilot; user name and password are as follows

3. Username- admin

4. Password- admin 123/ admin @ 123

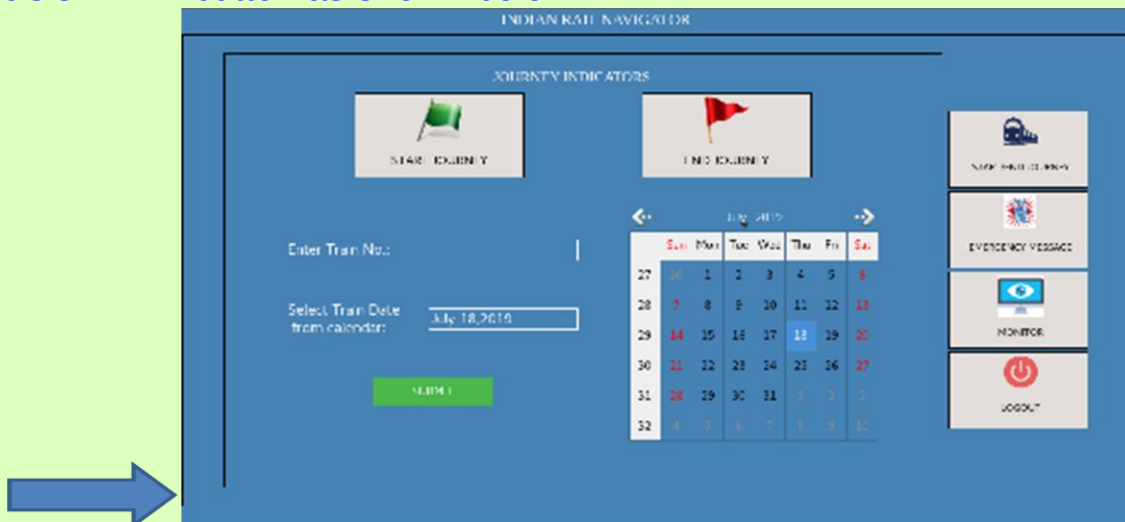
AFTER LOGGING IN, CLICK “START JOURNEY BUTTON TO START THE JOURNEY

In Order To Enter the Train Number Click on Text Box after Entering Train Number

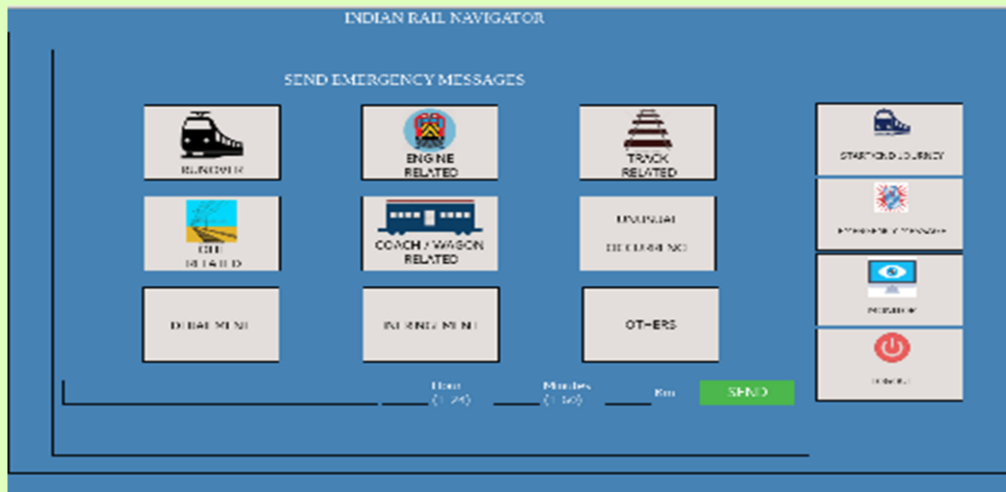


2. Click on Calendar to Enter the Start Date

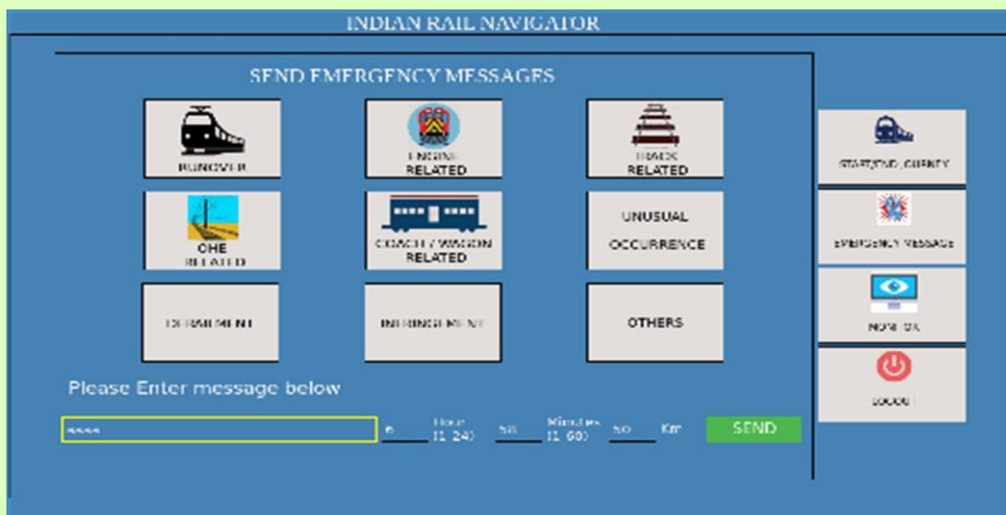
Please “submit” after entering these details when the journey finished click on END JOURNEY button as shown below



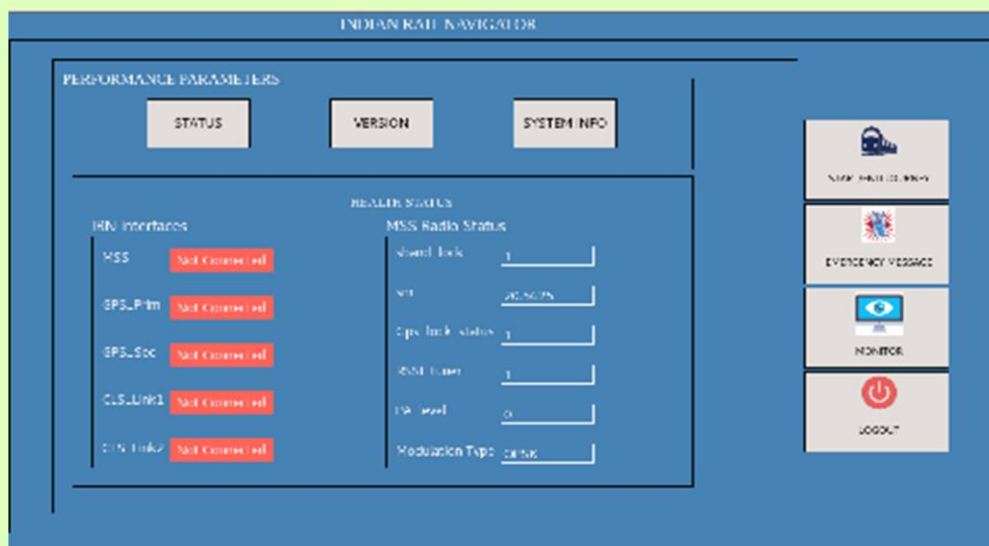
3. If any emergency message needs to be sent click on emergency message button following screen appears. Click on the button which is applicable for current emergency. On clicking on any of these nine buttons the GUI prompts if any additional



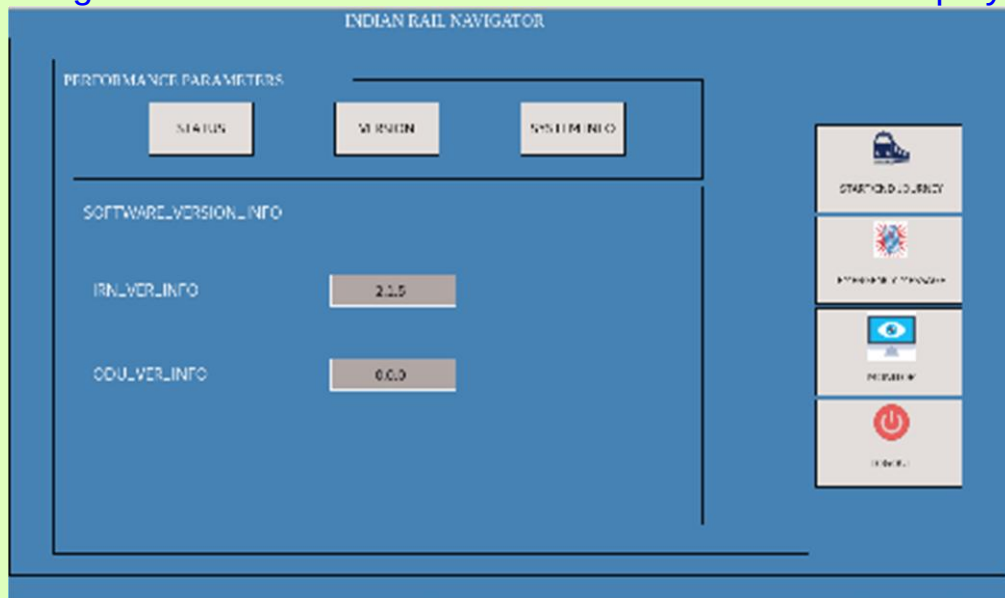
4 Information is required to be sent along with the message 40 characters can be entered in the space provided press send button after entering the information



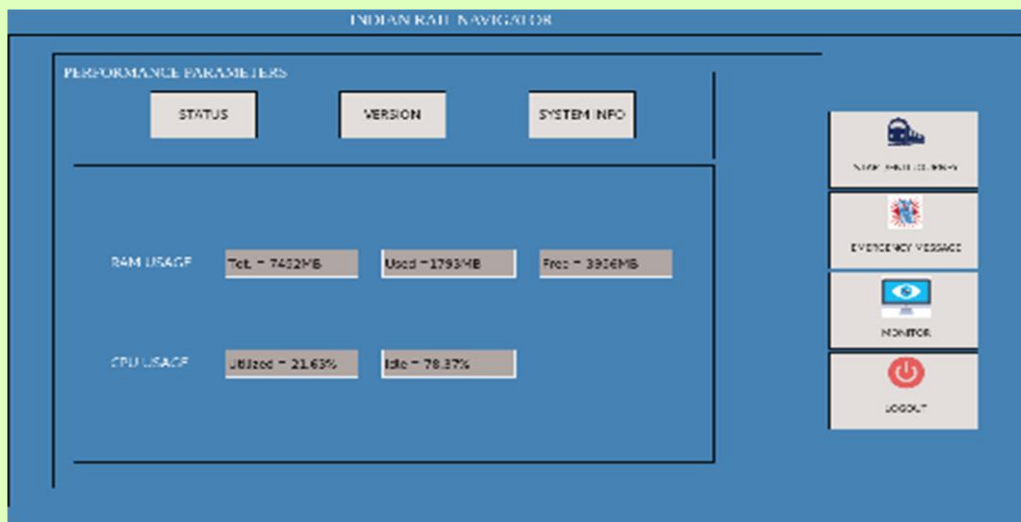
5 Click on the monitor button to check the performance parameters. On clicking STATUS button following screen will appear and will display the Health status of the device



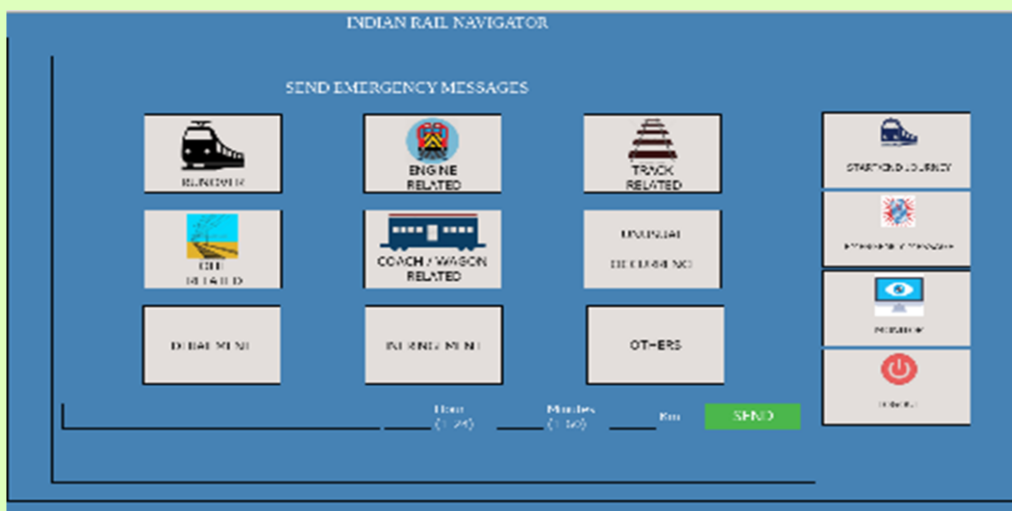
- On clicking “VERSION” button software version info will be displayed



- On clicking “SYSTEM INFO” Ram use and CPU use of IRN and will be displayed



- After completing any activity, click on “LOGOUT” button

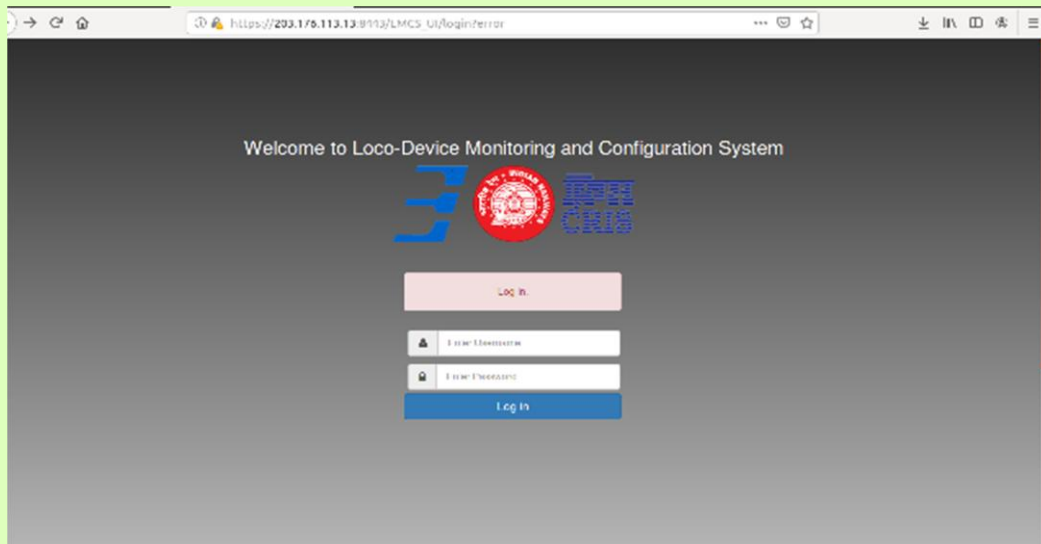


Features:

1. Provided real-time positional information of locomotives to Indian Railways.
2. Location reporting from each Loco device is routed through following three different media to ensure quantity of service
 - a) MSS satellite media
 - b) Air-tell 4G mobile Networks
 - c) Vodafone 4G mobile Networks
3. Loco pilot can send emergency message from locomotive to C R I S data centre
4. 10 inches rugged touch computer in locomotive for train number entry by Loco operator
5. Scalable system with provision for remote up-gradation.

6.4.3 Loco device Monitoring and Configuration System MCS

Enter URL [https:// 203.176.113.13. 8443/ LMCS_ UI](https://203.176.113.13:8443/LMCS_UI/loginerror) enter user name: Railway 123, password Railway @ 12 to login



The following screen will appear click on menu

Click On Menu > Report > Loco Location > All

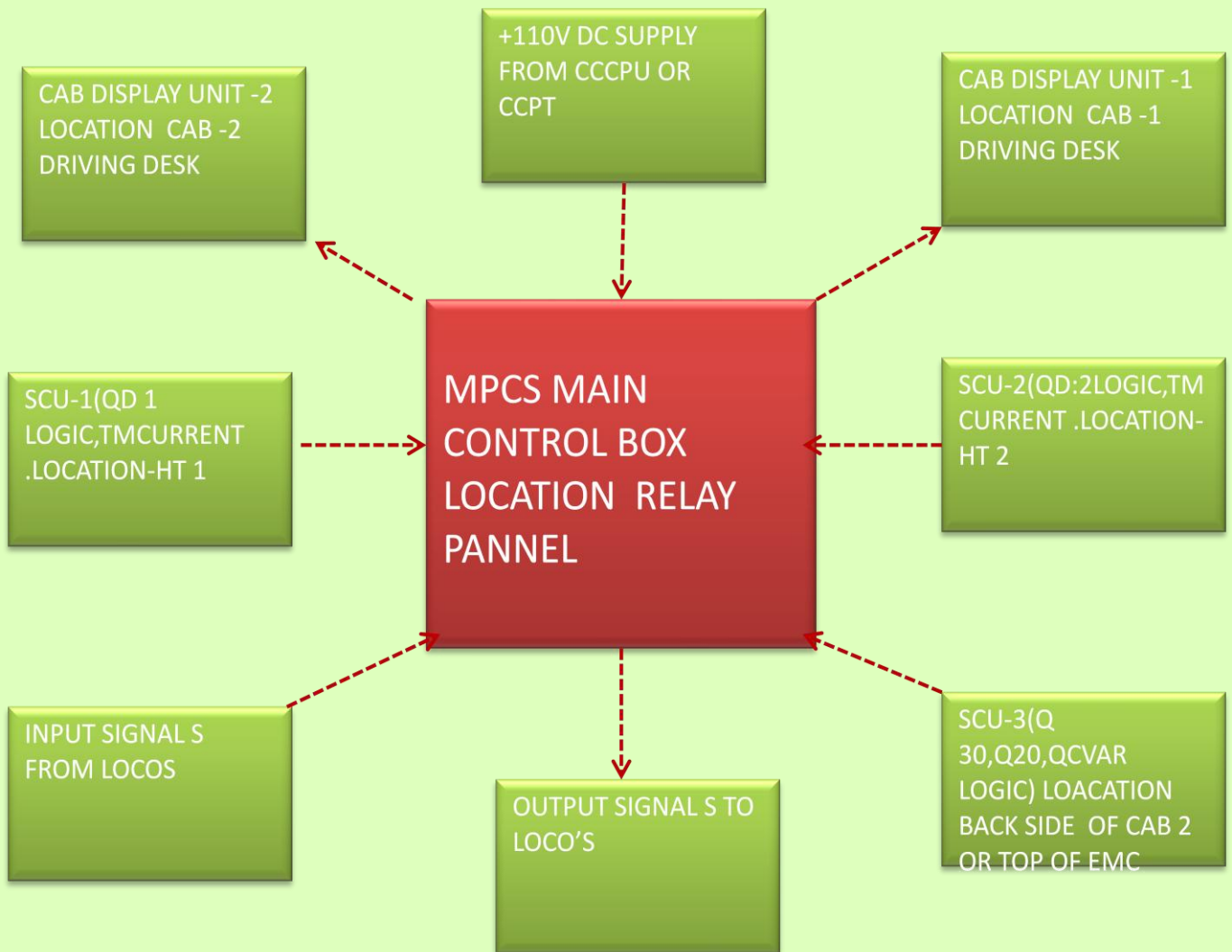
Click On Menu > Report > Loco Location-Shed Wise > Then Log Out

6.4.4 System Testing

1. Check the device ID
 - a) Go to home then IRN then Device ID file
 - b) Go to home right click and open terminal and type the command then / more /route IRN Dev. ID
 - c) Call the resident Engineer at CRIS data centre to know the status of data reception from all three media that is MSS SIM1 SIM2 for device ID shown in above file
 - d) If data is properly receiving from all three media, system is ok. If no check what is the system's fault

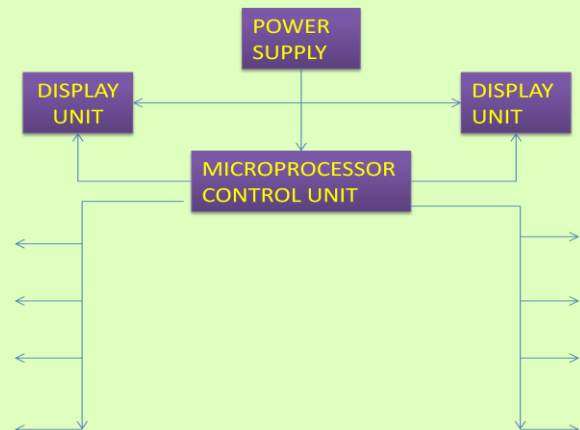
6.5 FUNCTION OF MPCS V -3

6.5.1 MICROPROCESSOR CONT. SYST. (MPCS)/FAULT DIAGNOSTIC CONT. SYST. (FDCS)



6.5.2 Microprocessors

Microprocessors are used in Electric Locomotives for the purpose of controlling and fault diagnostic system. This system is suitable for all types of conventional AC Electric Locomotives in ARNO or SIV provided locos. Microprocessor based control system version 2.0 has been updated as version 3.0.



+110 volt DC supply of MPCS has been taken from CCPT (6amps) instead of CCCPU (6A)

6.5.3 FUSE REMOVED: -

CCDJ, CCA, CCLS, CCLSA

6.5.4 RELAYS REMOVED

Q20, Q30, Q44, Q45, Q46, Q48, Q49, Q50, Q51, Q52, Q100, Q118, Q119, QV60, QV62, QV63, QV64, QVLSOL, QCVAR, QWC, QRS, QTD105, QTD106, QVCD

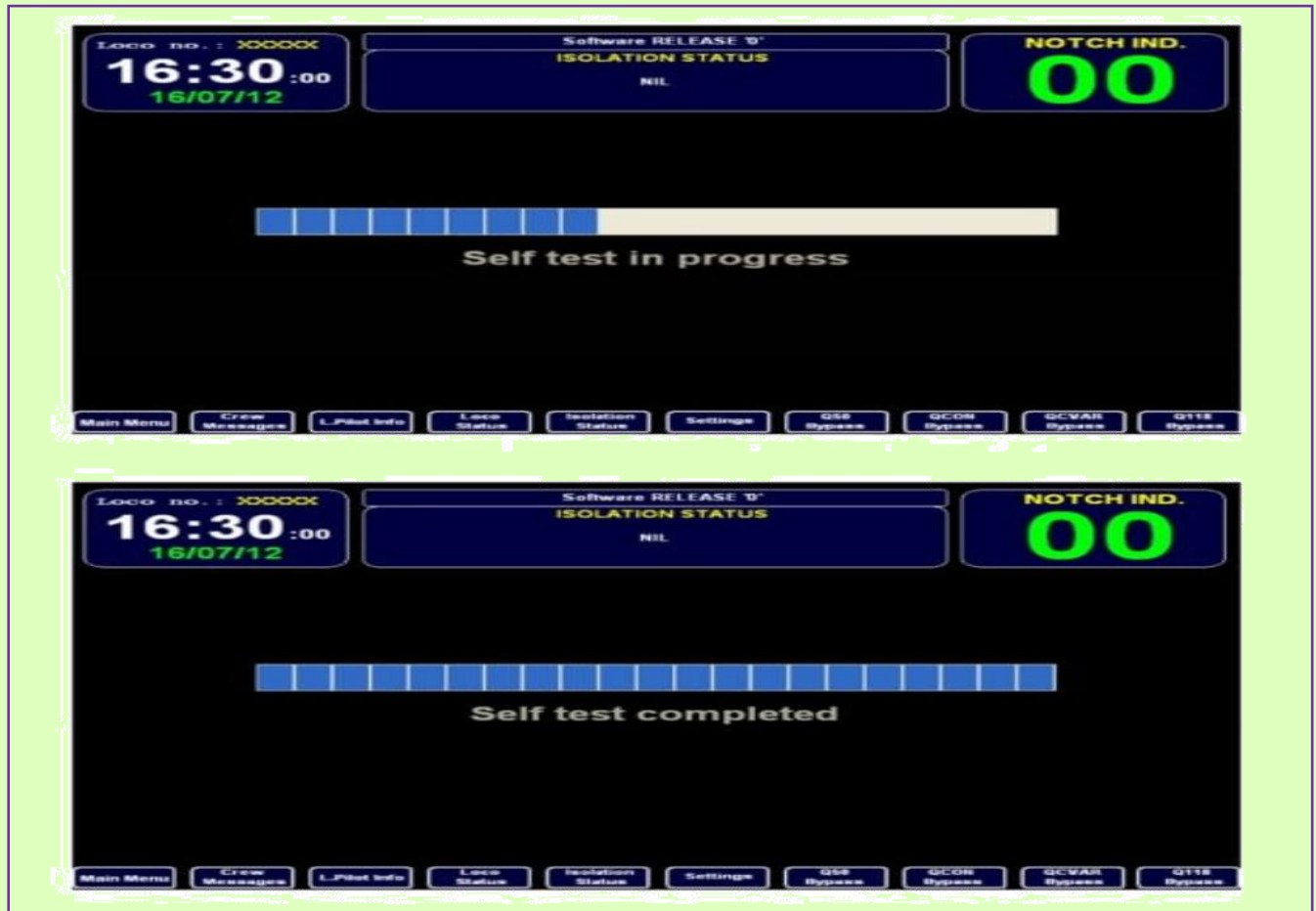
6.5.5 RELAYS AVAILABLE

QLM, QOP1, QOP2, QVMT1, QVMT2, QRSI1, QRSI2, QVSL1, QVSL2, QVRH, QPH, RGCP, QPDJ, RGEb, RGAF, QVRF, QOA(ARNO), QLA(ARNO), QSIT(SIV) QVCD, QFL, QE, QEMS

OPERATION	MESSAGE DISPLAY
HBA ON	Booting of MPCS (For few sec, & disappears). Waiting for command will appears
UNLOCKING BL	PRESS BLDJ
ZPT 1 OR 2	RAISING PT 1 OR 2
CLOSING BLDJ	PRESS BLRDJ
PRESSING BLRDJ	DJ CLOSED
TAKING NOTCH	Position notch by digital NR



6.5.6 Boot up screen: -



6.5.7 Display Screen Navigation

The buttons of the key pad of display screen, which act as soft keys, and their function will change depending on the screen by the user.

6. Display screen Navigation

The buttons on the bottom key pad are context sensitive keys which act as soft keys and their function will change depending on the screen selected by the user. The detail descriptions are as below:-

Keys	Default screen	Main Menu	Vehicle Diagnostic	Process Information	Self Test
1	Main Menu	Vehicle Diagnostic	Fault Diagnostic Data	Digital Input display	Digital input card test
2	Crew message	Process Information	Isolations	Digital Output display	Digital Output card test
3	L. Pilot's information	MU information	Browse Mode	Eliminated relay display	Communication test
4	Loco Status	Self Test	Exit	Analog parameter display	Exit
5	Isolation status	Exit		Life time counters	
6	Setting			Exit	
7	Q50 bypass				
8	QCoN bypass				
9	QCVAR bypass				
0	Q118 bypass				

6.5.8 User Interface and its Control

SI no.	Button name	symbol	Description
1.	Display ON/OFF key		ON/OFF TFT display unit.
2.	Luminance control key		Control brightness/contrast automatic as per present light condition and a sub menu displayed for manual setting of these parameters as given below:- <ul style="list-style-type: none"> By up/down keys select the brightness/contrast control options (default is brightness setting). Use right and left keys to set these parameters shows in the bar & % value. Press enter 'E' to save settings. 
3.	Main menu key		Key for entry in different menu options.
4.	Fault display key		Shortcut key for viewing the faults
5.	Back/cancel key		Go to previous screen
6.	Enter/ACK key		Enter final data or Enter into a sub option or go to the next screen by selecting and entering the NEXT Labels.
7.	Right key		Curser move right side
8.	Left key		Curser move left side
9.	Up key		Curser move up side/Increment/Decrement of digits
10.	Down key		Curser move down side/Increment/Decrement of digits
11.	Loco fault indication lamp	LSFI	Red color lamp
12.	Vigilance warning lamp	LSVW	Yellow color lamp
13.	Fault Acknowledge Button	BPFA	Yellow color

The display screen Control is provided through 10 keys, placed on Right side of the TFT screen. Display screen is also provided with two indications lamp LSFI & LSVW and one acknowledge push button" BPFA" lamp cum push button along with buzzer.

6.5.9 Main Screen/Default Screen, display shows the status of BL, PT, BLRDJ, BLDJ, MP, & MPJ

Parameter	Remarks
Loco Number	In 5 numeric digit
Date and Time	24 hrs Time(HH:MM:SS), Date (DD:MM:YY)
Notch Number	2 digit
Bypass/Isolation status	List of equipment Isolated/Bypass

If user selects the "Main Menu" (Soft key 1 or the soft key "M") display shows the main menu. Main menu has the sub options as shown below



6.5.10 Vehicle diagnostics: -

The "Vehicle diagnostics" screen appears when the user press soft enter-key "E" after the selecting Vehicle Diagnostic

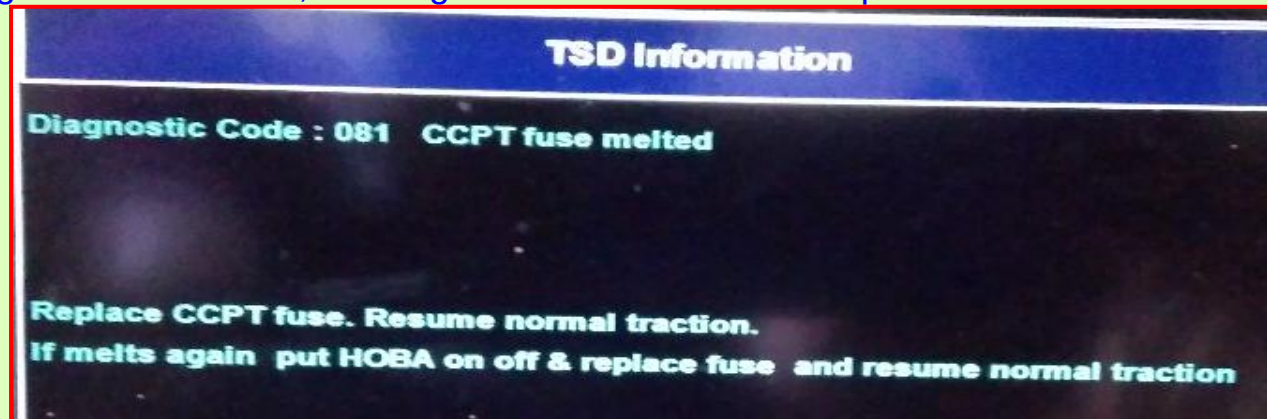
6.5.11 Diagnostic data: -

Press up & Dn keys to navigate & E select to sub option. Fault Data display Screen shows all the faults which are logged in the memory with diagnostic code & at the time, date



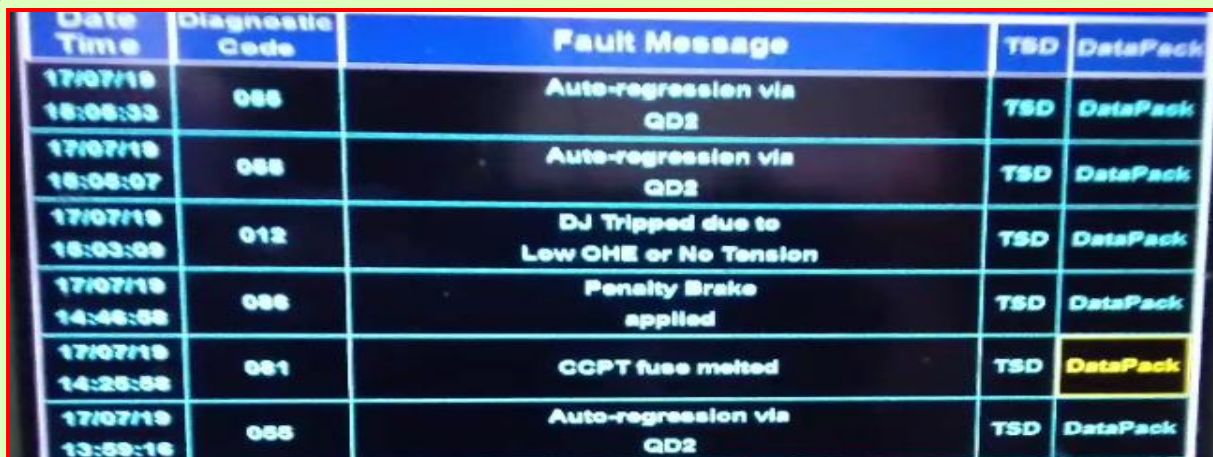
Date Time	Diagnostic Code	Fault Message	TSD	DataPack
17/07/19 18:43:31	081	CCPT fuse melted	TSD	DataPack
17/07/19 18:34:17	072	DJ Tripped via QSIT	TSD	DataPack
17/07/19 18:05:09	072	DJ Tripped via QSIT	TSD	DataPack
17/07/19 18:01:09	013	Loco is earthed	TSD	DataPack
17/07/19 17:50:30	081	CCPT fuse melted	TSD	DataPack
17/07/19	046	Total Loss of Tractive		

If user selects TSD information about TSD is displayed with the respective diagnostic Fault code, message& action to be taken as per instruction



TSD Information
Diagnostic Code : 081 CCPT fuse melted
Replace CCPT fuse. Resume normal traction. If melts again put HOBA on off & replace fuse and resume normal traction

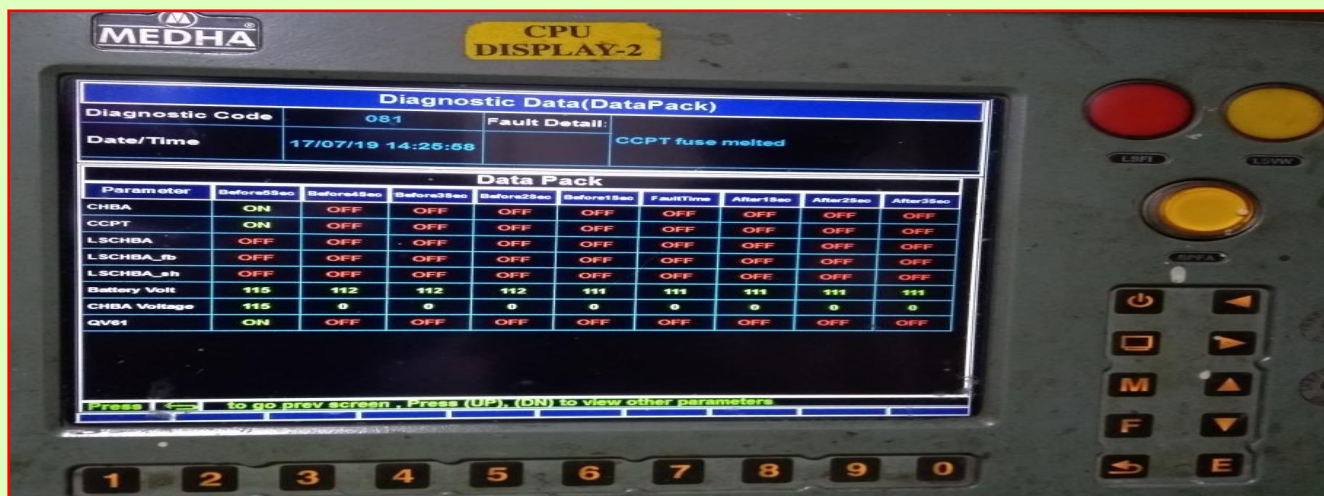
If user selects Data Pack, then option for viewing to analyzing the data at the time of Fault



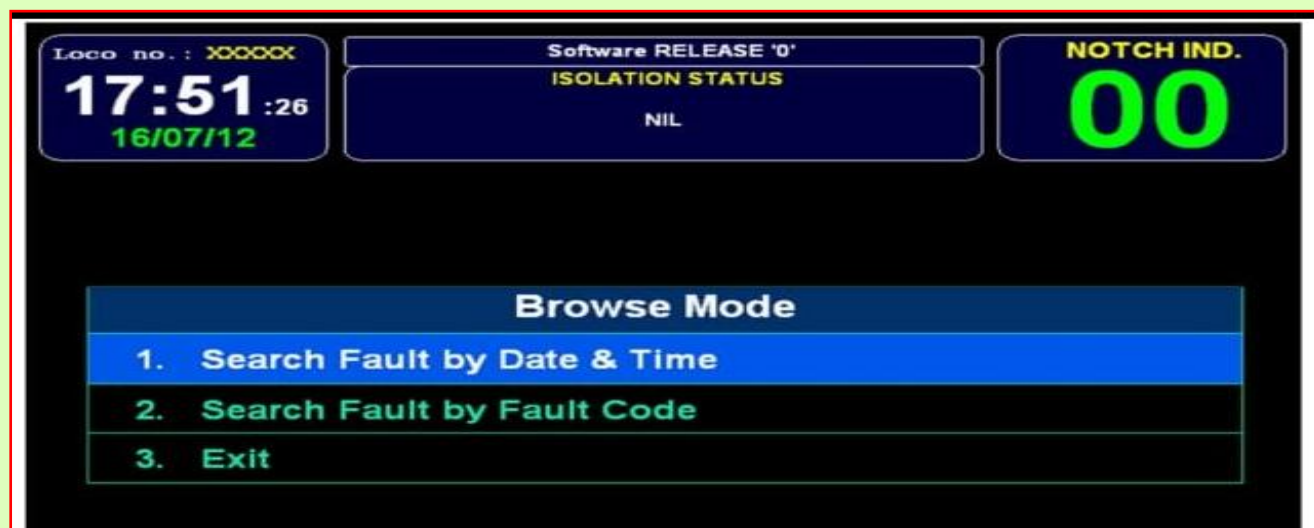
Date Time	Diagnostic Code	Fault Message	TSD	DataPack
17/07/19 18:08:33	088	Auto-regression via QD2	TSD	DataPack
17/07/19 18:08:07	088	Auto-regression via QD2	TSD	DataPack
17/07/19 18:03:09	012	DJ Tripped due to Low OHE or No Tension	TSD	DataPack
17/07/19 14:46:58	086	Penalty Brake applied	TSD	DataPack
17/07/19 14:26:58	081	CCPT fuse melted	TSD	DataPack
17/07/19 13:59:16	088	Auto-regression via QD2	TSD	DataPack

6.5.12 Browse Mode:

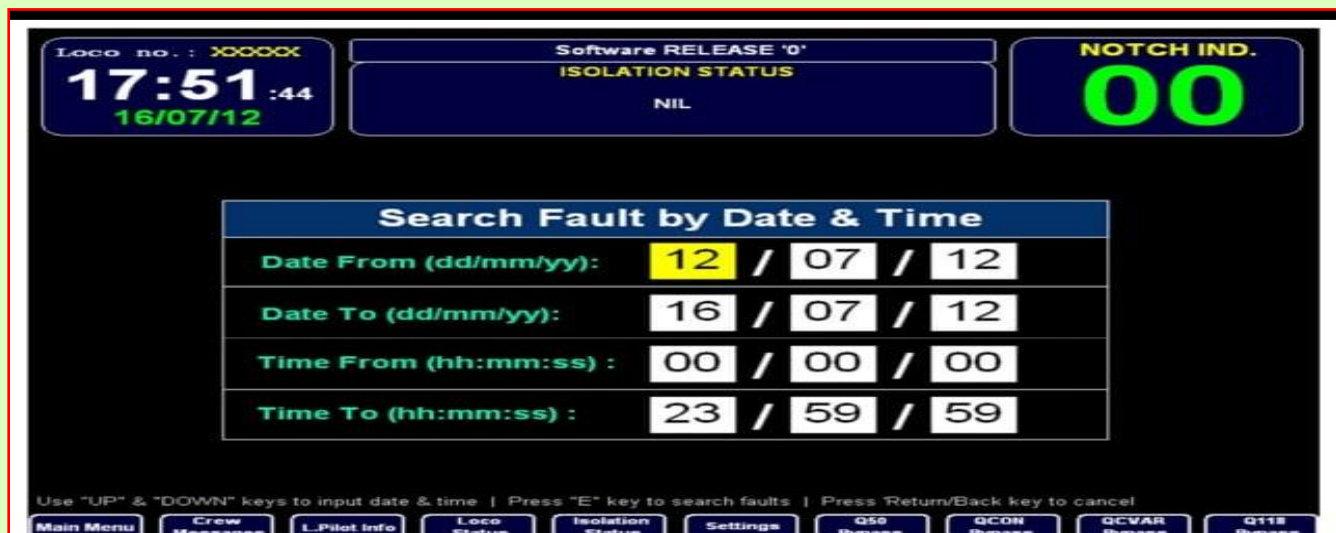
If user select the Browse mode then Browse menu screen have the sub options as shown 1) Fault Search by Date & Time 2) Fault Search by message code, 3) Exit



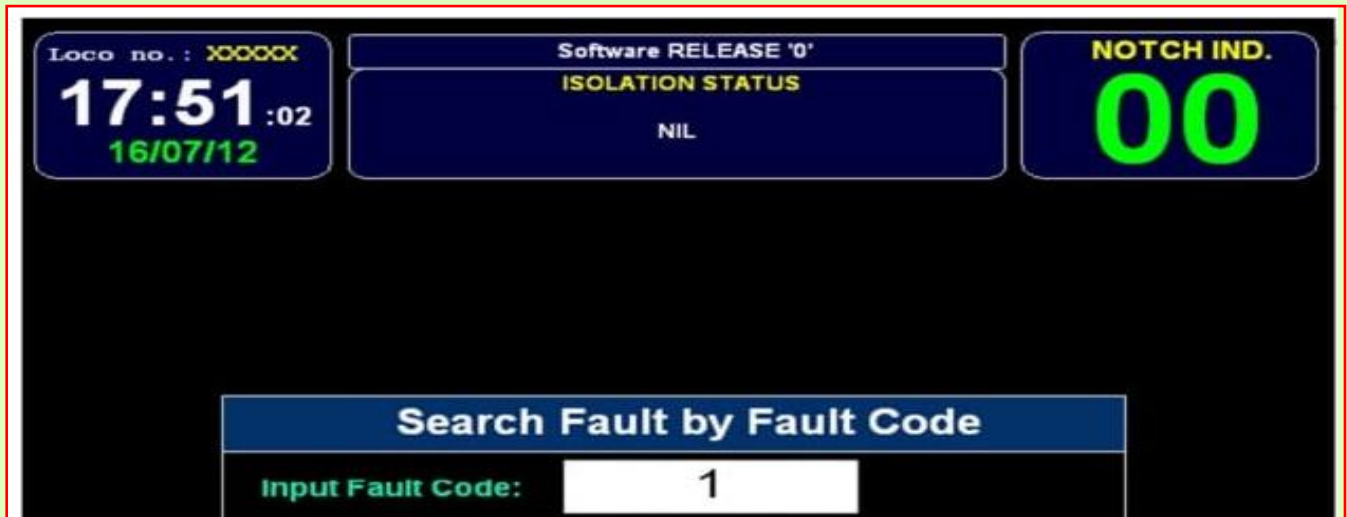
Browse mode: - If user select "Faults search by Date and Time"



Main Menu > Vehicle Diagnostic > Browse Mode > Search Fault by Date & Time



6.5.13 Search Fault by Fault Code



Isolation and Wedging: - If user selects "Isolation & Wedging status" option in vehicle diagnostic menu, then display shows

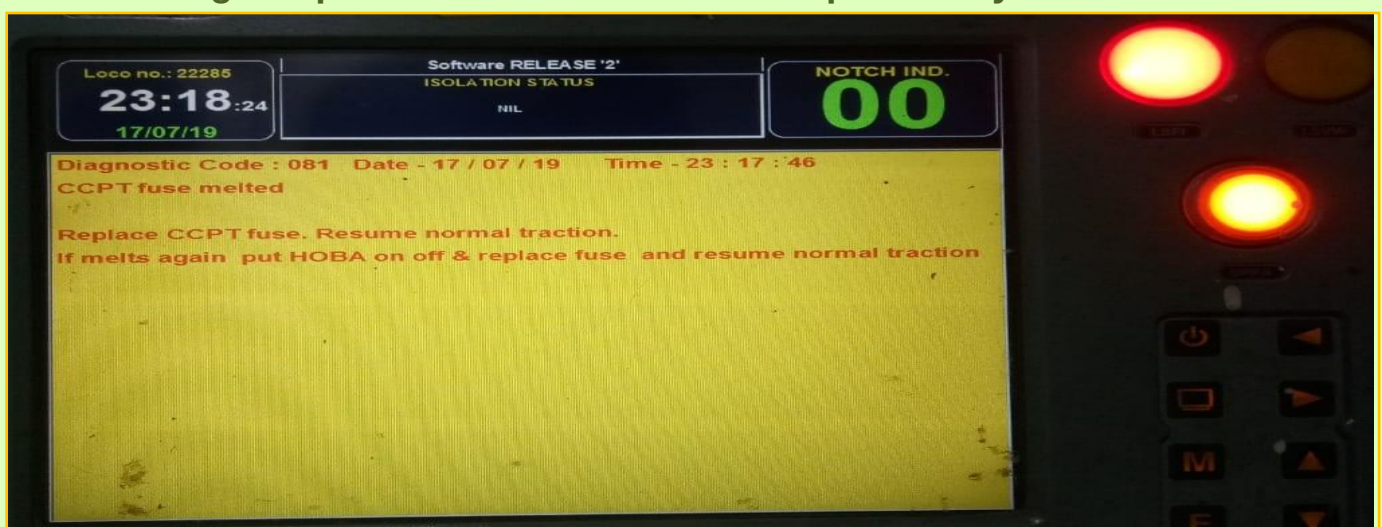
6.5.14 Trouble Shooting

Main unit not working

Indication: - No Pilot Lamp, No message on display unit & Loco will not energize

- 1) Ensure BA Voltage is above 90V
- 2) Add. CCBA, CCBA, CCPT, & CCCPU (if provide). If any fuse melted change it, if again melts keep HOBA in OFF & again change the fuse 3) PUT HBA in OFF, wait 3 minutes & again ON & try to energize loco
- 4) Try from Rear Cab
- 5) If till unsuccessful ask for assistance

ICDJ: - If fault message appears on display, then trouble shoots according to fault message as per TSD which is mentioned previously



6.5.15 Classifications of FAULT MESSAGE

- 1) Priority-1: Message related to DJ tripped, Total loss of tractive effort, Vigilance control & system related Fault & DJ should trip or Loco should be dead

2) Priority -2: All messages except the one listed above shall come under this category. Here only indication & storage should be done

A) Isolation Message:-Separate isolation messages in subsystems which can be isolated or given

B) Information Message: - These are not disturbance message but information to the LPP about the status of Loco operation

6.5.16 Comparative features of MPCS Ver-3 and MPCS Ver-2

S.N	FEATURES	Version-3	Version-2
1	1. Display COLOR,	Color 10.4", TFT	40ChX4Line LCD 2.
2	Remote monitoring	Yes	No
3	Inbuilt TSD	Yes	No
4	BP & BC pressure data	Yes	No
5	Speed data	Yes	No
6	Energy data	Yes	No
7	Hall effect sensors	Yes	No
8	Notch indicator	By encoders	By logic
9	Background data,(5 s B,C,3 s A)	Show as per fault	Show full data
10	VCD feature	Yes	No
11	Soft Relay bypass	Yes	NO
12	SEC & GTKM calculation	Yes	No
13	Configuration data	Yes	No
14	Transferring/Download fault data	USB, laptop, web server	USB, laptop
15	Event data display	Yes	No
16	GPS location	Yes	No
17	Time date setting	By GPS	By Manually
18	Graphical data for VCD, BP, BC, Speed	Yes	No
19	Diagnostic tool	Yes	No
20	Life time counters	Yes	No
21	Trip data counters	Yes	No
22	Couplers bayonet	Yes	No
23	Data entry through key pad	Yes	No
24	Battery voltage	Yes	No
25	Serial bus for MU	Yes	No
26	Server utility	Yes	No

27	Data for inspection schedule	Yes	No
28	DBR selector for logic	4 Types	2 Types
29	Web page Login	Yes	No

6.6 THREE PHASE LOCO –

6.6.1 PUSH –PULL OPERATION

6.6.1.1 Regarding push pull loco arrangement.

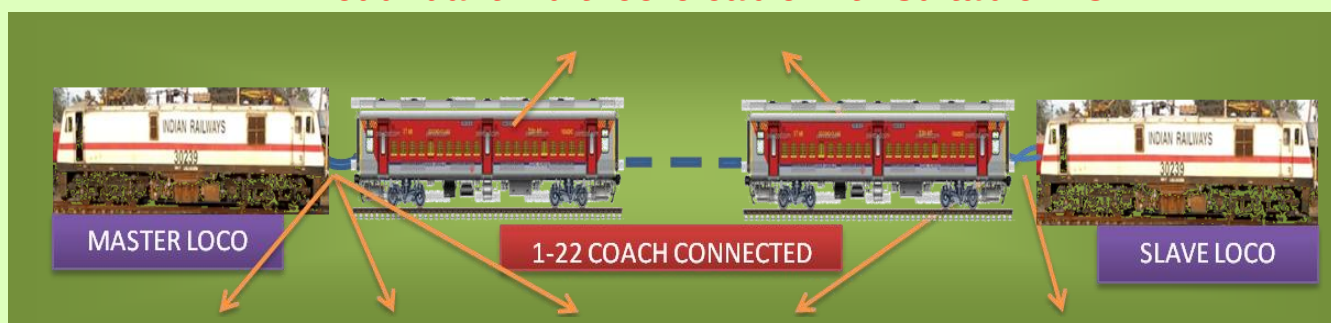
In order to enhance the punctuality of mail express trains and reduce the running time of train on the existing infrastructure, a decision was taken to haul the trains in push-pull mode. In push pull mode of operation, one locomotive each is attached at both the ends. The front (Master) locomotive “pulls” the rake and the rear one (slave) “pushes” it simultaneously. The push pull operation aims to increase the acceleration and braking which will improve average speed.

The notching and braking operations are carried out by crew in front locomotive which is performed simultaneously in rear locomotive being synchronized. The communication between the locomotives is established through UIC coupler and cable which runs throughout the LHB rake. For initial configuration Of slave locomotive, an additional panel is provided.

The connectivity scheme is as follows:

6.6.1.2 Connection diagram for push-pull

Redundant multi-core cable with suitable IVC



Cable with UIC Connector Straight Cable on Loco side Suitable connector provided Cross Cable in coach/power car

A trial was conducted in Sealdah division on 02/03.08.19 from Sealdah to Ranaghat to observe the improvements as well give a hand on experience to the crew.

Trial details:

1	Train No	LHB rake of Rajdhani Exp/Push-Pull Trial
2	Rake	LHB
3	Loco	30686(WAP7/HWH) & 30692(WAP7/HWH)

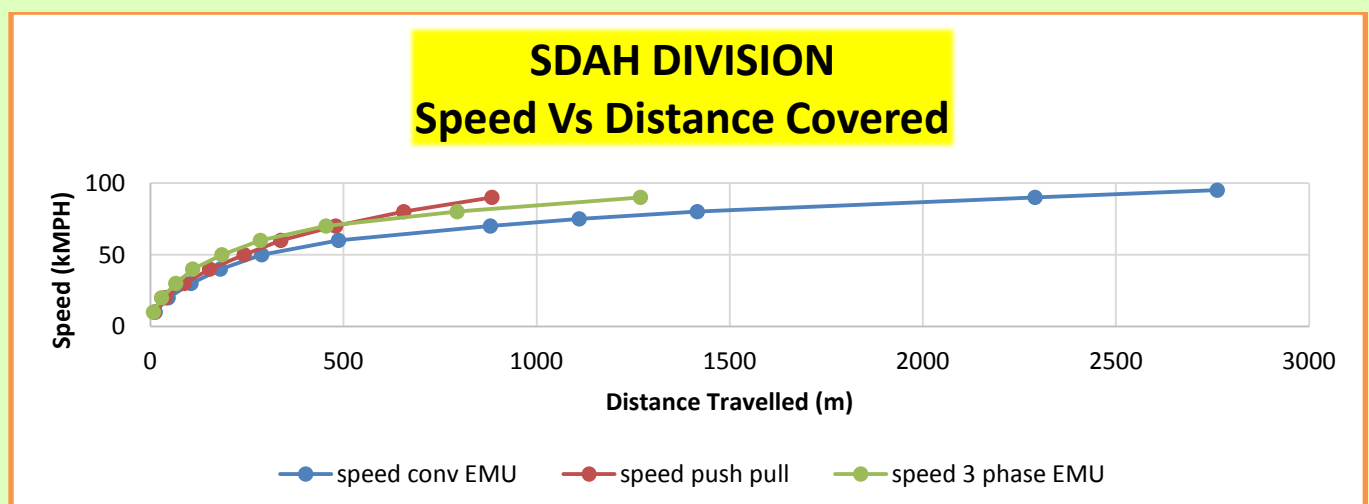
4	Section	SDAH – RHA – SDAHs
5	Load	20 LHB + 2 locos
6	Coach Formation	LWLRRM (1no) +LWACCW (3nos) +LWFAC (1no) +LWCBAC (1no) +LWACCN (13nos) +LWLRRM (1no) =20 LHB AC coaches. Total weight including two locos = 1157.7 (T)

A trial was conducted by RDSO from 19.11.2019 to 25.11.2019 on HWH—NDLS—HWH Rajdhani Route with 22-LHBA Coaches and one WAP-7 in front of rake and another at rear of rake in Push-Pull operation. The summary of Time taken during COCR trial run is given below.

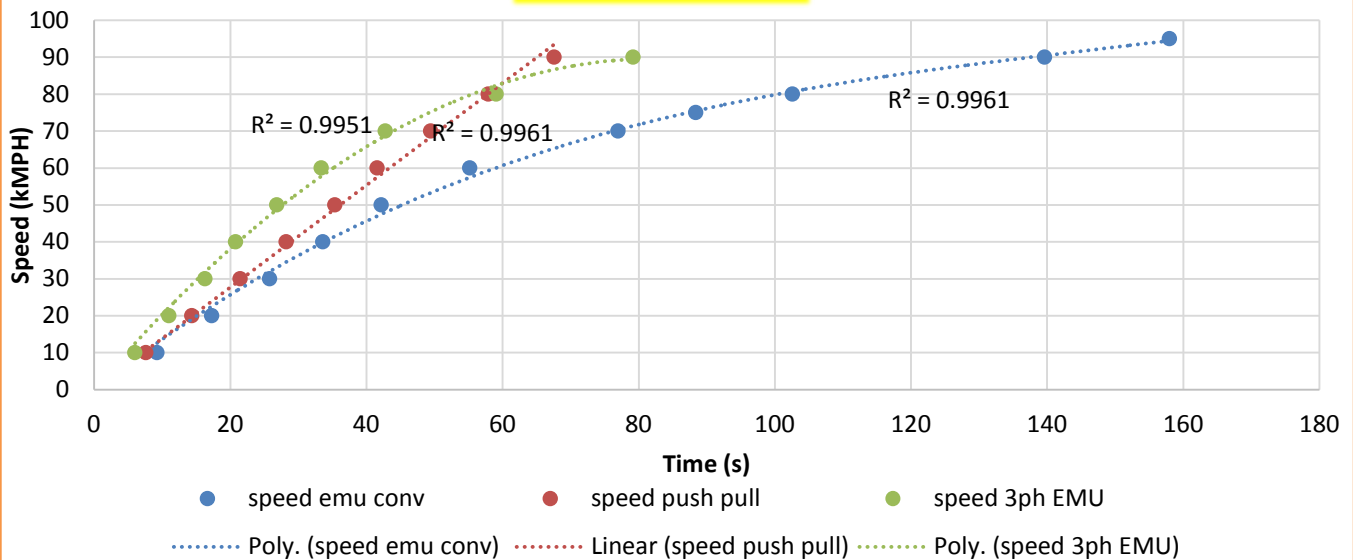
Section	Run Time of 12301 / 12302 Rajdhani Express (as per Public Time Table)	Actual Run Time of COCR Trial with 22 LHB coaches (excluding en-route detentions)
UP Direction		
HWH - NDLS	17h 10m As per Public Time Table(PTT)	15h 15m

Section	Run Time of 12301 / 12302 Rajdhani Express (as per Public Time Table)	Actual Run Time of COCR Trial with 22LHB coaches (excluding en-route detention)
DN Direction		
NDLS - HWH	17hr As per Public Time Table (PTT)	15h 31m

A comparative chart of push-pull with conventional and 3 phase EMU is as follows.



Speed Vs Time



It can be seen that it took only 67 seconds to achieve 90 kmph with is lesser than 3 phase EMU (79 seconds) and conventional EMU (140 seconds). It covered a distance of 885m in this period as compared to 1270m required by 3 phase EMU and 2290m required by conventional EMU. The acceleration too was constant up to 90kmph whereas it started drooping around 60-70kmph while the same occurred at 50-60kmph in conventional EMU. Savings is more significant at higher speed owing to constant acceleration in push-pull.

When compared to the ongoing Rajdhani Express driven by single locomotive, the time required to achieve **90kmph** is reduced to **67 seconds** from **171.25 seconds**. The same is just **128 seconds** for **130 kmph** against **292.5 seconds** at present. COCR trial was held between Howrah and New Delhi by RDSO during Push-Pull operation where the time saved was **115 minutes** in UP direction and **89 minutes** in DN direction.

6.6.2 Advantage of Push Pull operation:

1. In case of master loco fail, the train can clear block section by allowing traction in slave loco from master loco till MR pressure up to 6.5 kg/cm².
2. As the slave loco is coaching fit, rear loco is detached and put on the front and continuous journey in normal single loco hauled without losing much time.
3. In push pull operation, very quick acceleration and braking is possible. For that reason sectional time will be reduced.
4. In push pull operation **self hold** mode is **100 minutes** (normally self hold mode is **10 minutes** only).
5. Higher acceleration and deceleration thus recovery is quicker after caution zones, stoppages etc.
6. Faster braking and better regeneration during braking
7. Reduced coupling forces (lesser cases of CBC uncoupling)

8. Faster Terminal Clearance as detachment/loco reversal and associated shunting is not required.
9. Reduce manpower cost.

6.6.3 Operation of Push Pull Loco:

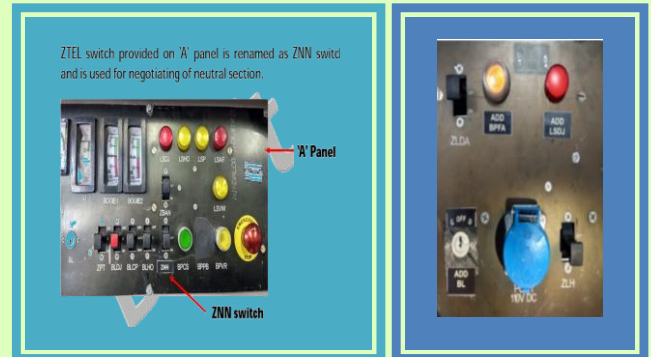
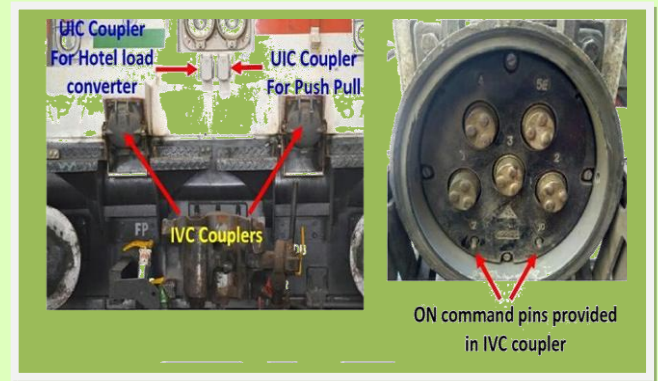
Modification in cab:

In push pull train operation, in driving cab, on panel D – there are one LSDJ pilot lamp, BPFA, additional BL key and in panel A ZTEL switch has been eliminated by ZNN switch (switch for negotiating neutral section) **** In HWH base loco, in place of D panel, all above are fitted in A-panel.**

In push pull loco there are two UIC (Universal inter communication coupler) Loco Pilot side is for push pull operation and asstt. Loco pilot side is for hotel load converter.

Master loco & Slave loco:

In push pull train operation leading Loco is called Master Loco and the rear Loco (in rear of load) is called Slave loco.



6.6.4 How to energise the both loco after connection with push pull theory

In slave loco – put on 112.1 and 110 MCB are at on position. Both sides SA -9 are in release position, and A- 9 put to neutral position and takes out the handle.

In slave loco – RS will active and pneumatic panel is deactivated.

After putting the above MCB are ON, come in master loco, then put BL key in D PANEL and move it from OFF to D position, additional LSDJ will glow on D panel. After 35 – 40 sec, additional BPFA provided on D panel will glow and latter BPFA will extinguish. After a few second and then take out BL key from D to OFF position. Now slave loco will become self hold mode for 100 minutes. Now put on BL key in A panel and move from OFF to D and wait for 35 – 40 seconds, DDU will display node information 504 for both loco(Master and slave loco) on screen. Now energise both loco from master Loco.

6.6.5 Negotiation of neutral section:

At 250 m. bring throttle to zero, and switch on ZNN. At DJ open board, OFF BLDJ and LSDJ will glow (in A- panel). At DJ close board switch on BLDJ and ensure extinguishing of LSDJ.

But additional LSDJ provided on D panel or A- panel in master loco will remain extinguished condition continuously. Actually after BLDJ OFF in master loco, DJ of slave loco will open after 350 m. and after DJ close of master loco, DJ close of slave loco after 750 m

6.6.6 Advantage of Push Pull operation:

In case of master loco fail, the train can clear block section by allowing traction in slave loco from master loco till MR pressure up to 6.5 kg/cm².

As the slave loco is coaching fit, rear loco is detached and put on the front and continuous journey in normal single loco hauled without losing much time.

In push pull operation, very quick acceleration and braking is possible. For that reason sectional time will be reduced.

In push pull operation **self hold** mode is **100 minutes** (normally self hold mode is **10 minutes** only).

6.6.7 In push pull operation some extra feature like:

CP synchronizing will start after slave loco reaches MR pr. Cut out value, but if that time master loco reaches the cut out value, then safety valve will blow in master loco of CP.

From master loco to slave loco all command takes only 15 mille sec time lag.

In push pull operation in master loco no fault message will be pop up on DDU on slave loco, fault message will be recorded in slave loco and can be seen in DDS.

In push pull operation fault message will be pop up on DDU of master loco with LSFI glowing along with the loco number. From loco number loco pilot will understand whether the fault is in master loco or slave loco, accordingly action to be taken as per TSD.

6.6.8 When communication Fail (Node of information 704) –

In case of communication fail between master loco and slave loco, message of “communication disturbance” is displayed in DDU of master loco and following action take place

1. VCB tripping in master loco.
2. VCB tripping and lowering of pantograph in slave loco.

Master loco can be worked by closing VCB.

6.6.9 CE off procedure in push pulls operation –

Put BL key in D panel or A- panel (extra BL key) and rotate in C side and again C to OFF and take out BL Key. Now BL key rotate C from OFF position in A- panel and again rotate to OFF and take out the BL key. Then CE will become OFF in both loco.

6.6.10 How to operate VCU in both Loco (if VCU is provided)

DJ trip, lower pantograph, press VCU but do not release VCU and advice to press the slave loco VCU and release it after 3-4 sec and then node information 504 will come in slave loco, then release VCU of master loco and again node information 504 will come in master loco, then raise pantograph and close DJ work

6.6.11 Cock position:

<u>SL NO</u>	<u>Cock/switch</u>	<u>Master loco</u>	<u>Slave loco</u>
1	Pantograph selector switch 85.*	Auto mode	Auto mode
2	Feed pipe charging cock 136	open	Close/isolate
3.	BP charging cock 70	open	open
4.	Emergency exhaust cock(SIFA) 74	open	open
5.	Dead mode cock 47	close	close
6.	IG-38	open	open

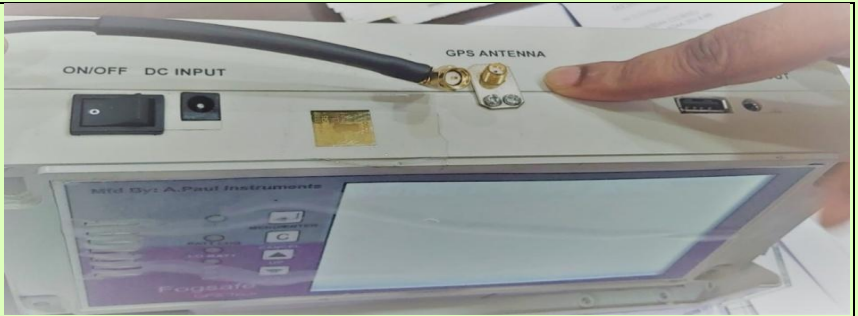
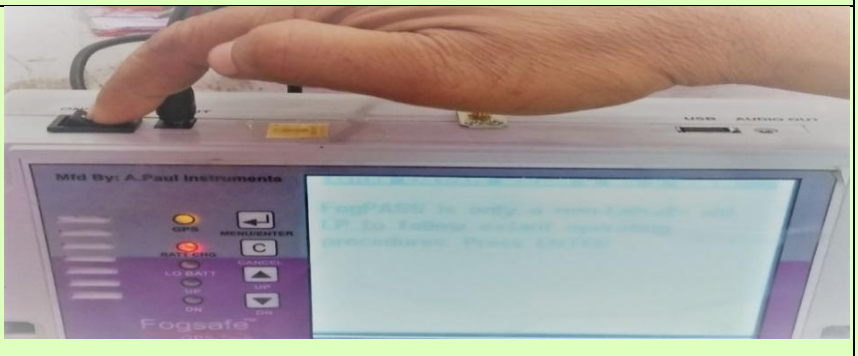
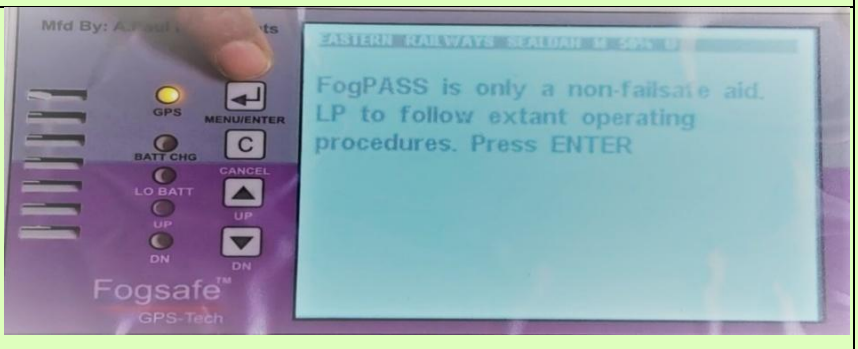
In master loco, Pantograph selector switch 85 to be manually selected so that rear pantograph is raised

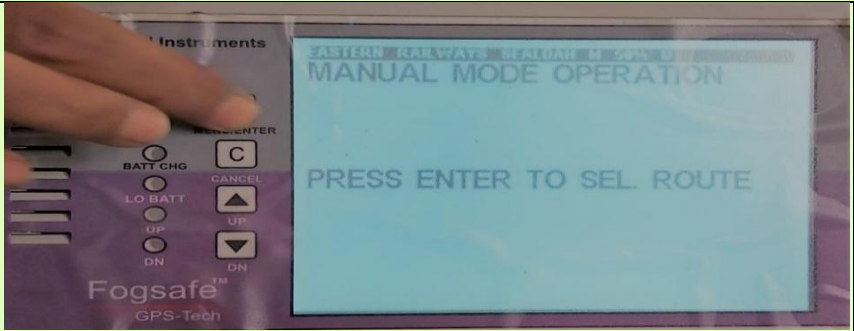
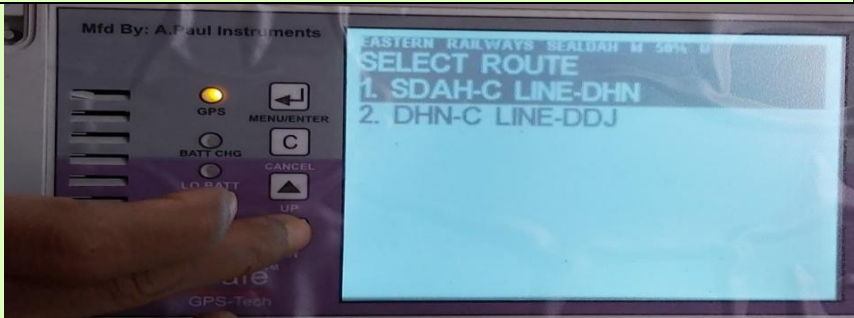
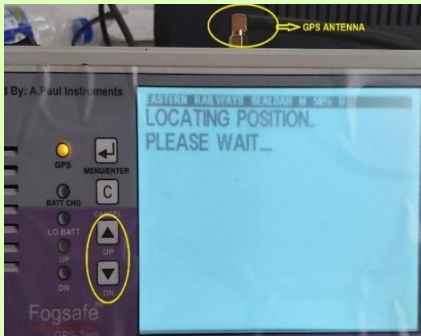
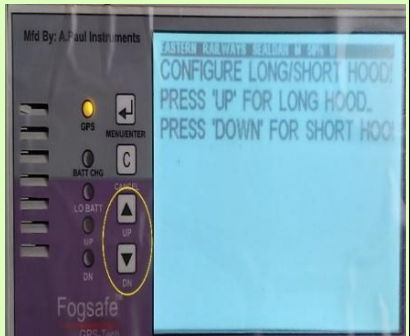
7 TECHNICAL COUNSELLING ON USE OF FOG-PASS DEVICE

7.1 FOG – SAFE-DEVICE

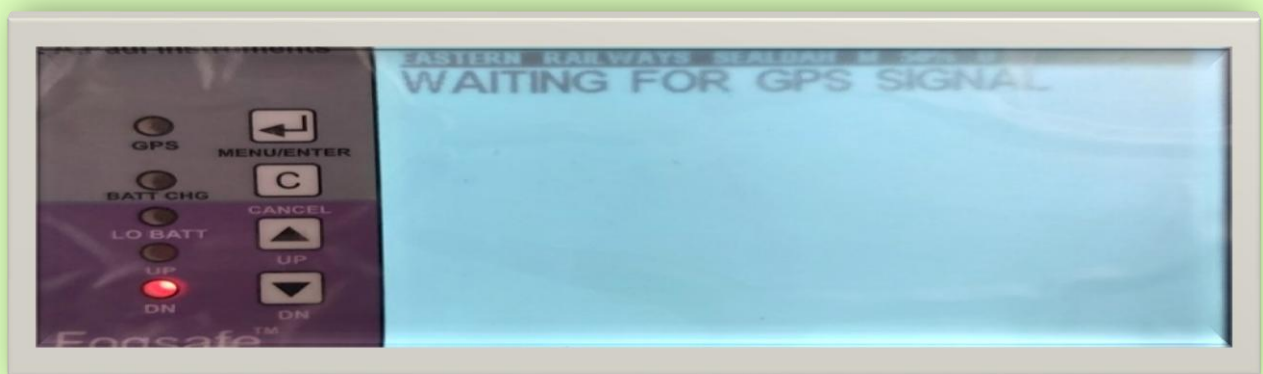
7.1.1 How to use

Following steps should be followed by the crew to make the FOGPASS device ready for by them while working trains during foggy weather:

STEP-1	Insert the GPS antenna pin gently; place another end of GPS cable as much as outer side of loco.	
STEP-2	Switch on the device.	
STEP-3	After announcement press enter	

STEP-4	After announcement, press enter to select routes	
STEP-5	Use up & dn. keys to select route, then press enter	
STEP-6	After GPS connects, use up & dn. keys to select long hood or short hood	 

Action taken by LP: - Wait for 30sec to 1min, if nothing happens then check the antenna connector/antenna wire & correct placing of the antenna.



***** Now the device is ready for use**

NOTE: - All the process to be done as quickly as possible otherwise it will time out. Then press “C” button and repetition of the process will happen.

** If the device failed to get valid GPS signal, then GPS LED light will start blinking & it will display the following message: - **“Waiting for GPS Signal”**.

7.1.2 LED Indications

1. GPS: Blinks while device is receiving valid GPS data
2. BATT CHG: Glows while the device is being charged using the adapter provided.
3. LO BATT: Glows when the battery backup left is nearly 2 hours.
4. UP: Glows when the route selected is a UP track.
5. DN: Glows when the route selected is a DOWN track.

Do/Don'ts for Fog-PASS: -

- I. Take care of LCD screen, don't place any heavy substance on FOG-PASS.
- II. Take the device away from water so water is not entered in the internal electronic part it may cause malfunctioning of device.
- III. During charging process switch on the supply after connecting the adapter to the FOGPASS.
- IV. Place the device having appropriate space to use the swiveling feature of FOG-PASS.
- V. Special Take care of Antenna. Don't press the antenna wire between doors or windows; it may cut the antenna wire. Don't Drag or hold the antenna through wire.

8 OPERATIONAL NOTES FROM OPERATING SIDE

8.1 RULES REGARDING CAUTION ORDER (Appendix I of G&SR - Caution Orders)

1. Check, whether the machine number appearing in the T/409 form is entered at the top right hand corner in the cyclostyled/typed sheet annexed. When typed, cyclostyled or printed caution order are issued and annexed to the form T/409.
2. As a temporary measure, the Caution Orders may be permitted to be prepared on white paper with green band running diagonally across the form.
3. Check, each page of Caution Order is stamped and signed, station code initials should not be used and both permanent and temporary SRs in force are printed in geographical order in relation to the direction of the train.
4. In case of change of train Crew en-route, the Loco Pilot /Guard taking over charge must take over all Caution Order relating to his train to acquaint himself of the condition on the line giving due acknowledgement to the Loco Pilot who is being relieved.
5. In case of an assisting or banking engine being attached at a station en-route the responsibility for acquainting himself about restrictions shall lie on the Loco Pilot of such an engine.
6. The SM of Notice Station shall issue "Nil" Caution Order in Form T/A-409 to Loco Pilot and the Guard of all trains leaving his station if he has received no intimation of any special precaution to be observed between his station and the next Notice Station of the train, in the direction of movement. The Loco Pilot shall not start the train and the Guard shall not give signal to start the train from a Notice Station until they have received the Caution Order.

7. Motorman of EMU and Suburban trains will be required to see that they receive caution orders for all the trains covering their links at the time they sign on duty and shall acknowledge receipt of such caution order and record in the register indicating their number of the caution order.
8. The Loco Pilot should hand over the Caution Order to the Loco Foreman/Traction Foreman at the end of their journey along with other train papers.

Detaching Engine: G& SR-4.57

Whenever a train has been brought to a stand and it is necessary for the engine, with or without vehicle, to be detached from the rest of the train before the train is uncoupled.

The guard shall satisfy himself that the van-brakes have been put on securely and take other measures as may be prescribed by special instructions.

Loco-pilot are responsible for the coupling of their engines to trains at starting station and for the un-coupling at engine changing station and also at any station where an engine has to be detached for loco requirements.

At other station staff is responsible for uncoupling and coupling.

Temporary single line working on Double line

1. Working of trains on one line of D/L section due to obstruction/accident or any other reason on adjacent line shall be introduced
2. Trains can be operated by any one of following procedure
3. By obtaining Line clear on electric communication instruments (short duration)
4. By the installation of Single Line Block Instrument (Long duration)
5. To introduce temporary Single Line working on Double Line the SM should receive written advice from a competent Engineering official and then consult with controller and SM at the other end.
6. TSL working shall be introduced between two nearest stations where the crossover between UP and DOWN lines is provided on either side of the obstruction
7. The Block Instruments at the intermediate stations shall be kept locked in the TOL (Train on Line) Position
8. Any C class station shall be temporarily closed during the entire period of TSL working. The signals Shall be kept at ON and the same can be passed underwritten authority of the SM of either end (T/D -602)
9. If the trains are running on the right line, the LSS shall be kept at 'ON' and if the trains are running on the wrong line, all departure signals shall be kept at 'ON'
10. Before introduction, the SM proposing S/L working shall issue message containing the following to the SM at the other end---
 - a) Cause of introduction of S/L working
 - b) The line on which the S/L working is proposed
 - c) Source of information that the said line is clear
 - d) Location of obstruction
 - e) Speed restrictions, if any
 - f) Names of intermediate C class stations closed
 - g) Assurance that the trap points are set for the said line and spiked

- h) The number and timings of the last train which arrived or left the block station issuing the message
- i) On receipt of acknowledgement from the SM confirmed by PN, the TSL working is introduced and

Line Clear will be obtained on electrical speaking instruments

SM shall issue the authority T/D 602 to GDR.

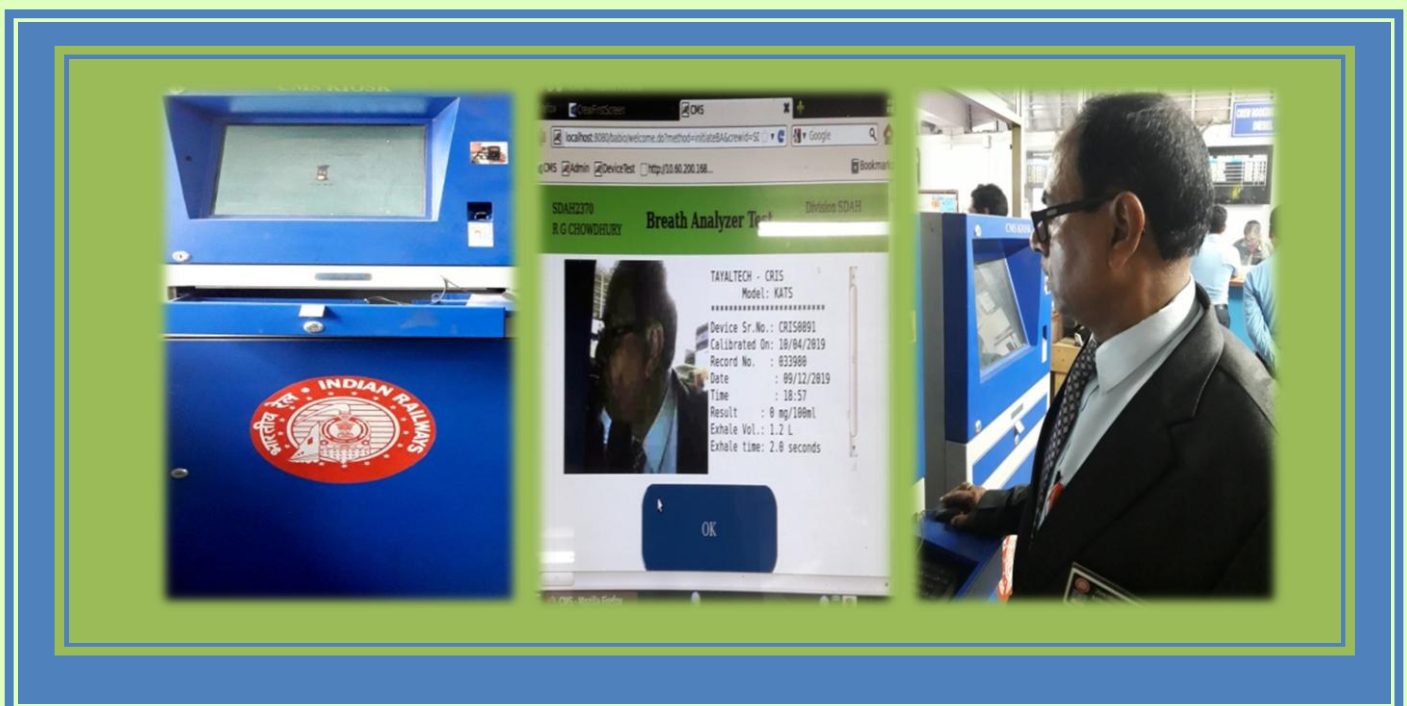
- a) A Caution order issued for each train stating
- b) The line on which the train is to run
- c) The Km/Posts between which the obstruction exists
- d) Speed restriction if any
- e) Assurance that trap points if any are set properly and spiked
- **The LP of the First Train to inform all Gatemen and gang men on the way about the introduction of TSL working and the line on which the trains will run**
- **LP shall switch on the Flasher light while running on the wrong line**
- The speed of **the first train** shall not exceed **25 kmph** and subsequent trains may run at booked speed
- when train is running on right line – Except LSS[LAST STOP SIGNAL], all signals may be taken off
- When the train is started on wrong line – The trains shall be piloted out of the station on form **T/511** after all facing and trailing points are secured correctly up to the last set of points.
- On reaching the next station, the LP shall stop at FSS [FIRST STOP SIGNAL] pertaining to the right line or at LSS pertaining to The wrong line whichever comes across first
- Trains running on right line may be received on signals
- Trains running on wrong line SM shall arrange to pilot the train into the station on written authority Through a competent railway servant
- The Engineering officials shall intimate the SMs stating that the obstructed line is free and safe for Passage of trains
- SM shall inform the message to SM of station at other end and exchange PN[PRIVATE NUMBER]
- SM introduces normal working, after consulting with section controller and after the last train which Entered section during TSL working cleared section
- The Block instruments shall be brought into use
- The intermediate stations which have been closed shall be again brought in to operation
- An entry to be made in TSR [TRAIN SIGNAL REGISTER] at all stations, showing time of D/L working suspended and Time of S/L working introduced and time of normal working resumed
- LP of the first train after the resumption of normal working shall inform all Gatemen and Gang men on the way regarding the restoration
- The TI shall scrutinize all records and submit his report to the DRM within 7 days of Resumption of normal working.

Sending Relief Engine/Train into an occupied block Section

- ❖ When the block section is obstructed due to Accident or engine failure or any other reason, any number of relief trains may be sent on T/A 602
- ❖ The location shall be mentioned in T/A 602.
- ❖ Speed not to exceed 15/10 (Day/Night) on both S/L and D/L.
- ❖ The Loco Pilot should switch “ON” the flasher light of the train engine while running on the wrong line on proper authority to proceed.
- ❖ In case, the train engine running on the wrong line without switching “ON” the flasher light is noticed by the station staff, Gatemen and Gang men, they shall stop the train immediately.
- ❖ A sharp look out must be kept at all times and the Loco Pilot must be prepared to stop clear and short of any obstruction which may exist or crop up on the track.
- ❖ When approaching the station, LP to stop the train at the FSS on S/L. On D/L (wrong direction) stop at the foot of LSS of the same line or opposite to FSS of the adjacent line, whichever comes first and the train must be received by piloting on a written memo.
- ❖ If no one turns up from the station within 10 minutes, Assistant Loco Pilot /Guard shall be sent to the station to inform Station Master of the arrival of the train/light Engine /self-propelled vehicles or make contact Station master through signal post telephone, if provided or by other means of communications if provided.
- ❖ During night if Electric Head Light is not in working order, the train or Light Engine must be preceded at an adequate distance by a Railway Servant carrying Detonators and exhibiting Red Light ahead to stop any other approaching train.

9 NEW ACHIEVMENT IN OUR LOBBY

9.1 KIOSK WITH INBUILT CAMERA A NEW ADDITION IN OUR LOBBY



9.2 INAUGURATION OF KOAA REST ROOM BY HONOURABLE GM

Some Memorable Moments



10 REGARDING “CHALAK PATRA”

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3] 3-PH EMU

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5] 3-PH LOCO

: CLI- G. Sarkar, S.S. Bhakta, U. Halder,
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*****ALWAYS KEEP YOUR TRAIN UNDER CONTROL AS PER SIGNAL ASPECT *****

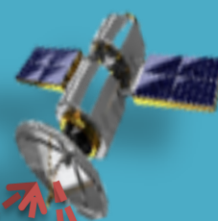


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R-T-I-S



CONTROL ROOM



JULY- DECEMBER 2019

SEALDAH

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