(196)

NORTH WESTERN RAILWAY

CE Circular no. 124

Sub: Quality in construction Projects.

There is need to achieve optimum quality in construction projects. Instructions on this subject have been issued by Railway Board from time to time and specific provisions exist in Engineering Code/IRPWM & RDSO specifications regarding the standards to be achieved in Construction Projects.

There is a need to compile various instructions issued by Railway Board on the subject as also in various codes. There is also a need for personal inspections by Open line and Construction Engineers at various stages of the project construction. In this connection, a Joint Procedure Order has been drawn by CTE, CE/C/I and CSE, duly combining Civil Engineering and S&T portions of works. 3 stage joint inspection has been envisaged which should ensure proper quality control for projects and smooth handing over and taking over between Open line and Construction.

All the Engineers and supervisors of Open line and Construction organization on NWR should follow the JPO scrupulously on all Construction Projects. Copy of the JPO is attached.

(No. W/432/0/CE Date: 05.07.2011)
DA: JPO with Annexure (35 sheets)

(H. K. Jaggi)
Principal Chief Engineer

NORTH WESTERN RAILWAY

JOINT PROCEDURE ORDER

Sub: Opening of the newly converted/doubling section

Ref: PCE's Note No. W/632/1/Vol. I dated 12.10.10

Detailed instructions were issued vide Board's letter No. 2003/W/2DL/01 dated-10-04-03 (**Annexure-I**) as well as in the Engineering Code on the subject regarding handing over of New Lines, Gauge Conversion and Doubling Projects to open line. Construction and open line officers (Engineering, S&T and Electrical) should have active co-ordination and liaison during execution of the works. In this regard, it is observed, in past, that projects are commissioned with some deficiencies and thus inviting criticism of the Engineering Department for both Open line as well as Construction Organization. Keeping this in view, the JPO is framed to further improve upon the quality and commission the projects in time with coordinated effort of Construction and Open line Engineers.

1.0 Aim of the joint procedure order is to ensure that

i. All the works required before opening of the section have been completed as per prescribed provisions.

ii. Deficiencies, if any, which can be recouped later, have been identified and the responsibilities for their recoupment/fulfillment have been pointed out jointly by Open line and Construction along with a concrete action plan for complying the deficiencies in a time bound manner.

iii. Sanction of posts and arrangements of personnel for the maintenance departmentally or throughout sourcing have been tied up and all the arrangements are in place on the date of opening.

2.0 To achieve above objective, there should be active coordination between Open line and Construction Engineers at various stages of construction.

These stages are

1st stage - When earthwork & bridges are in progress

2nd stage - When linking is in progress

3rd stage - When the line is ready for inspection of Commissioner of Railway Safety

3.0 During 1st and 2nd stage of work Construction Executive will advise the progress made in the project to the Open line. Open line may plan the inspection and advise the improvements required for satisfactory completion of the project which will be suitably complied during the progress of work. Inspection can be at supervisory or at Junior Scale/ Senior scale level.
While executing the work or inspecting the work, check list at **Annexure –II** may be kept in mind.

4.0 **3rd Stage:** Joint inspection should be carried out at Branch Officer level when the section is ready for offering to CRS. An MOU should be drawn for removal of deficiencies in a time bound manner by Construction/Open line chargeable to construction estimates. MOU will be signed by Sr. DEN/DEN of section and Dy.CE/Construction.

5.0 All the left over works which are directly affecting the safety and operations should be completed by Construction Organisation before offering the line for inspection of the Commissioner of Railway Safety. Deficiencies noted during the inspection of Commissioner of Railway Safety affecting the safety directly shall be completed by Construction Organisation before commissioning the project. It should be ensured that all the documents and other details are handed over/taken over as stipulated in **Annexure-III.**

6.0 Memorandum of understanding will be drawn showing list of works to be executed by Open line /Construction Organization. Items which are not related to safety but left out during execution can be done by open line. Construction organization will provide funds for the same.

7.0 **General**

7.1 Construction organization will provide ETKM/ITKM calculation duly vetted by associate finance in advance to Sr. DEN/C of the Division so as to process for creation of posts. Open line will process for creation of posts and filling up of vacancies before the line is offered for inspection of Commissioner of Railway Safety.

Till the manpower is available for maintenance of newly opened line, contract should be place for outsourcing of non-core track maintenance activities by Open line.

7.2 Due care shall be taken in handling of 90 UTS rails as per procedure laid down by RSDO in letter CT/Rails/handling dated 13/20-11/2006.

7.3 Newly laid track should be fit for deployment of track machines as per instructions in force before track machine is demanded for temping of track.

7.4 In order to recoup ballast deficiency, which may remain short due to various reasons, some quantity up to 30% on case to case basis should be procured by Open line /Construction in nearby depot chargeable to the construction project.

8.0 **Material /T&P items to be handed over before opening of the section.** As enclosed in **Annexure –IV.** Adequate provision shall be kept in the estimate for the same

9.0 S & T Works:-

Commissioning of S & T works and handing over /taking over of S&T installations will be governed as per JPO between CSE & CSTE (Construction) attached as **Annexure - S&T.**

20.6.11
(S. K. Mittal)
CTE

21/06/11
(M. B. Vijay)
CE/C-I

17/6/11
(S. B. Bhamu)
CSE

Annexure-I

GOVERNMENT OF INDIA
MINISTRY OF RAILWAY
RAILWAY BOARD,
NEW DELHI

No.:- 2003 /W-2/DL/0/1 Date 10-04-2003

Sub:- Construction of new lines, doubling etc handing over maintenance

Detailed instructions were issued vide Board's letter No. 89/W2/DL/07 dated 13-06-1994 covering handing over of new lines and doublings to open line. It was specified that new line and doubling projects will be initially opened at a minimum speed of 80 KMPH. The speed will be increased to 100 KMPH by construction organization and thereafter complete handing over will be done within 60 days to open line.

Para 1609 of Engineering code stipulates that "all new lines should be taken over by Open line organization within six months of the date of opening for goods traffic. Ballasting and other residual works if any should be got done by the open line against the construction estimates.

But, in view of the limited emphasis on maintenance activities within the construction organization, the issue has been re-examined in Board's office and Board has decided as under:-

(i) Construction organization should arrange for CRS inspection at the earliest after New line, doubling etc. are commissioned, the line should be handed over to Open line only after opening at 80 KMPH for passenger trains. The subsequent raising of speed will be done by Open line.

(ii) However, in case it is decided that passenger trains are not to be run due to certain reason, the line will be handed over to Open line within 3 month of opening to goods traffic at 80 KMPH. CRS inspection will however, be coordinated by construction organization if it takes place within next one year of taking over by open line.

Further, to ensure smooth handing over & proper maintenance of assets, the following extant instructions should be followed.

1 Taking over of assets

1.1 The newly created assets are to be taken over by open line organization without any delay and it should be the responsibility of the CE/Construction to keep the THOD apprised with the field work being executed by constriction branch right from the beginning so that new works are executed as per specification.

1.2 Adequate advance preparation should be made by both open line and construction before the work is handed over for which the coordination should start as soon as the work is sanctioned. The detailed schedule of works should be advised by construction to open line so that both sides can do adequate planning and carry out regular joint inspections at various levels commensurate with the progress of the work. For this purpose PCE and CAO/C are to issue joint circulars indicating responsibility of CE/C and THOD of Engineering. Department and other SAG officers of Electrical, S&T and other user Departments and the concerned SAG officers of the Construction Department.

1.3 15 days before the CRS inspection /opening of line, a joint inspection will be carried out by open line and construction and any shortcoming noticed should be attended before CRS inspection. For the items that cannot be attended, a Memorandum of Understanding will be drawn showing list of works to be carried out to make the section fit for maximum permissible speed. The residual works will be executed by Open line /Construction as decided in the MOU, chargeable to construction estimate and adequate funds shall be provided for this purpose by construction. However completion report of the project will be drawn by construction.

2 Maintenance Staff

2.1 With the laying of concrete sleepers, mechanized maintenance becomes the only method of maintenance and necessary equipments for MMU etc. should be provided for in the estimate of doubling, new line and gauge conversion projects by construction organization. These equipments should be procured by the construction branch and handed over to the open line while handing over the section.

2.2 The construction Department will prepare the details of work load in respect of maintenance of new assets i.e. Route Km., Track Km., ETKM, ITKM, Water way, plinth area etc and get them vetted from their associate finance. These, duly vetted figures will be submitted to PCE who will process the creation of posts and get these sanctioned. Open line shall process for recruitment/transfer of men as required so that the men are in position at the time of commissioning for traffic.

The above instructions supersede any other instructions issued in this regard.

(V. K. Duggal)
Director/ Works,
Railway Board

NORTH WESTERN RAILWAY

Annexure- 1 (Contd)

Taking over by open Line

1618. When handing over a project or work to the open line authorities, at least two copies of the documents specified in **paragraphs 1620 to 1633** should be prepared. One copy each of the documents should be sent for record in the division and the other for record in the headquarters Office of the open line administration.

1619. Transfer of Charge. --The charge should be made over to the open line Assistant Engineer by the construction engineer in the manner indicated in Chapter **1 of engineering code.**

1620. Narrative Handing over Notes under the following heads should be prepared by the construction engineer: --

(a) General Description of the Line. --All points of importance under several main heads of works should be dealt with under this head. Special attention should be paid to:

(i) ruling grades, maximum curvature, compensation for grades, vertical curves, transition curves.

(ii) axle loads for which bridges hive been constructed;

(iii) Number of sleepers per rail;

(iv) type of ballast; and

(v) list of works to be completed by the open line and charged to construction estimates, the dates by which these should be billed and paid for being specified.

(b) *Important Bridges.--For* each important major bridge a separate note should be prepared giving details of training works provided. Estimated discharge, maximum scour allowed for etc.;

(c) Maintenance Notes.--Notes, in particular on special portions of banks , cuttings, catch water drains, etc. which require special attention in monsoon or during sand storms should be prepared.

1621. List of Bridges.--This should be prepared on **Form E. 1621**, taking care that details regarding founds are accurate:-

Form E. 1621

LIST OF BRIDGES

Division.....

No. of Bridge	Kilometerage and Telegraph post	Spans	Type	Standard strength of girders			Nature of Found	Training works	Remarks
				Flange	Rivet Shear	Rivet bracing			

1622. List of Buildings.--This will be prepared on printed Form E. 1977.

1623. List of level Crossings.--This should be prepared on the following form:-

Form E. 1623

LIST OF LEVEL CROSSING

No.	Kilometre and telegraph post	Chainage	Description and class of level crossings	Remarks

1624. List of Bench Marks.--This should be prepared in the following form:--

Form E. 1624

LIST OF BENCH MARKS

No.	Value	Kilometre and telegraph post	Chainage	Description	Remarks

1625. List of Completion Drawings.--A list of all the drawings and tracings, made over to the open line should be prepared and signed by the construction engineer.

1626. List of Tools and Plants Made Over.--This should be prepared in the form given below:-

Form E. 1626

LIST SHOWING TOOLS AND PLANTS MADE OVER BY

P.W.I..... Construction to P.W. I ..... Open line.

Item	Description	Number	With gangs 1 2 3 4	Gate	Work	PWI	Head	SWI

No.		handed over	5 6 7 8 9 10 so on	Keepers	shop staff	Trolley man	1 2

Handed over ..... Taken over.....
(Signature) (Signature)

1627. List of Permanent-Way Material Made Over as imprest.--This should be prepared in the following form:-

Form E.1627

LIST OF PERMANENT-WAY MATERIAL MADE OVER BY

P.W.I. ..... construction at ..... to P.W.I. Open line, as an imprest

Item No.	Particulars	With gangs 1 2 3 4 5 6 7 8 9 10	P.W.I.	Remark

Handed over ..... Taken over.....
(Signature) (Signature)

1628. List of Petty and Consumable Stores Made Over.--This should be prepared in Form E. 1628. Petty stores, such as speed boards, clear, Boards, hand flags, etc., which are handed over to the open line at the of Transfer should be shown in this form.

Form E. 1628

PETTY STORES HANDED OVER BY

P.W.I. ..... to P.W.I. .....

First Equipment

Item No.	Description	Quantity or number	Remarks (This should give notes as to distribution)
MM			

Handed over ..... Taken over.....
(Signature) (Signature)

1629. List of Interlocking Material Made Over.—Interlocking if any, handed over by the Construction Branch should be shown in the following form:-

Form E. 1629

LIST OF INTERLOCKING MATERIAL MADE OVER BY

P.W.I. ..... construction at ..... to ..... Open (line)

Item No.	Description	Quantity of material made over	Remarks

Handed over ..... Taken over.....
(Signature) (Signature)

1630. List of Material lying at Site of Works Made Over--This should be prepared in the following form:--

Form E. 1630

LIST OF MATERIAL LYING AT SITE OF WORKS ON .....

Construction made over to. . . . . Division Open Line.

Item No.	Telegraph post chainage	Ballast	Bricks	Bricks bats	Lime	Surkhi	Sand	And as on	Remarks
		Brick Stone	1st 2nd 3rd						
		C.m. C.m.	No. No. No.	C.m.	C.m.	C.m.	C.m.		

1631. List showing Maintenance Labour and Staff Transferred to Open Line--This statement should show the name, father's name, rate of pay and date of appointment of the employees who are on maintenance duty at the time of handing over and transferred to open line.

1632. Track Renewal Graphs--These should be prepared in accordance with the rules prescribed by the open line administration.

1633. Statement showing Route and Track Kilometrage--This statement should show:--

(a) route Kilometrage;

(b) track Kilometrage (which usually differs slightly from the route Kilometrage, the latter being from the centre of station to centre of station);

(c) siding Kilometrage (which should show *(i)* Operating sidings, *(ii)* Commercial sidings and *(iii)* Total sidings, and

(d) total kilometrage of tracks, i.e. total of *(b) and (c).*

It should be noted that (b) "Track kilometrage" should correspond exactly with the track renewal graph. This statement should be prepared in the form given below:--

Form E. 1631

STATEMENT SHOWING KILOMETRAGE OPEN TO END OF..... ON..... RAILWAY CONSTRUCTION.

Particulars	Route--Kilometres			Track--Kilometres			Siding Kilometres	Total track Kilometres	Remarks
	Main Line	Branch Line	Total	Main Line	Branch Line	Total			

****

NORTH WESTERN RAILWAY

Annexure-II

Sr. No	Items	Descriptions
1.	Formation	i. Formation level and width, cross slopes, side slopes of bank/cutting. ii. Quality of earth work. iii. Quality of Blanketing, thickness of blanketing. iv. Protection on high bank, bridge approaches. v. Trolley refuses vi. Side drains, catch water drains
2.	Bridges	i. Work as per approved drawings. ii. Weep holes as required. iii. Backfill at bridges as per RDSO specifications **Other items in Minor Bridges:** i. Painting of HFL and Danger level etc. ii. Clearance of water way. iii. Bridge No. Plaques. iv. Completion plans. **Other items in Major Bridges:** i. Marking of HFL, Danger level and flood gauge etc. ii. Clearance of water way. iii. Bridge No. Plaques. iv. Completion plans. v. Bridge inscription plaques. vi. Trolley refuses vii. Bridge name board viii. Apron, cut of wall/toe wall and ease holes as per approved plan ix. Pitching and inspection steps x. Completion plan xi. Stressing chart in case of PSC girders. xii. Ladders on piers wherever required. xiii. Protection works, ballast deck level, and path ways as per approved drawing xiv. Bearings. xi. Steel girders :- Dimensional checks , Alignment and leveling of steel girders & Chambers in steel girders
3.	Track	i. Ballast cushion ii. Sleeper density iii. Fish plated joints (availability of 1 m long fish plates) iv. Fittings of P&C v. Weld registers. vi. USFD test results and action plan for removal of IMR defects. vii. Joggle fish plating on curves, bridge approaches as per IRPWM Para 429 and Para 277 (A) (7) provisions. Joggling of untested & defective welds. viii. Bolt hole chamfering

		ix. Initial greasing of ERCs, fish bolts and SEJs as per LWR plan. x. Bridge approaches and guard rails xi. Records of de-stressing of LWR xii. P&C inspection registers xiii. Curves and curve register, xiv. Reference markers – Curves, (SE particulars and station nos. painting on rail) xv. Curve board, LWR board, Gang/beat boards. xvi. LWR plans, yard plans. xvii. Laying tolerances of track as per IRPWM.
4.	Level crossings	i. Check rails ii. Speed breakers iii. Road Surface between gate posts and approaches iv. Gradient and levels as per IRPWM v. Gate and gate posts vi. Caution board, strip boards C-34, C-39 as applicable, W/L board. vii. Gate lodge and duty bunks, water arrangement. viii. Gatemen's equipments. ix. Visibility x. Detonator posts and marking.
5.	Yards	i. Yard layout with respect to approved yard plan ii. SEJs iii. Center to center distance of track iv. Distance block of platform lines v. Clearance of platform lines vi. Height of platforms vii. Distance of signal posts from center of track. viii. Infringement to SOD should be verified. ix. Yard drainage
6.	Finishing items	i. Kilometer post ii. Hectometer post iii. Gradient post iv. Railway Boundary posts. v. Land plans (land boundary to be verified as per land plans).
7.		Any other item/tolerances as per IRPWM, Engineering Code etc.

NORTH WESTERN RAILWAY

Annexure-III

Records & Registers to be provided at the time of handing over

Sr. No.	Items
1	Points and crossing inspection register
2	Curve inspection register
3	Level Crossing inspection register
4	LWR/CWR inspection register
5	AT/FB welding details
6	Bridge register
7	Completion yard plans of all the stations
8	Completion plan of all the bridges
9	Index section
10	Index plan
11	LWR/CWR plan
12	CRS papers
13	Land acquisition details plan
14	Details of cuttings and tunnels
15	Plinth area of new structure & dismantled structures
16	List of suppliers of P. way material

P. way materials

Sr. No.	Items	Quantity to be handed over (NL, GC)	Quantity to be handed over for doubling
1	Rail 52 Kg/60 Kg new	2% of the total track	1% of the total track
2	Rail 52 Kg/60 Kg SH	2 % of the total track	1 % of the total track
3	Fish plate 60 Kg/52 Kg 1 m long	10 sets per gang	10 sets per gang
4	Joggled fish plate 52 Kg/60 Kg with clamps	10 sets per gang	10 sets per gang
5	Fish bolts 52 Kg/60 Kg.	15 Nos. per gang	15 Nos. per gang
6	Glued joints 52 kg/60 Kg	4 Nos. per yard	2 Nos. per yard
7	SEJ 52 Kg/60 Kg	1 set per yard	1/Two yards
8	Fan shaped 1 in 12 switches 52 Kg/60Kg	1 set per yard	1/Two yards
9	Fan shaped 1 in 8.5 switches 52 Kg/60 Kg	1 set per yard	1 set per yard
10	CMS crossing 1 in 12	1 set per yard	1 set per yard
11	CMs crossing 1 in 8.5	1 set per yard	1 set per yard
12	Grooved rubber pad for 1 in 12	1 set per sub division	1 set per sub division
13	Grooved rubber pad for 1 in 8.5	1 set per sub division	1 set per sub division
14	Grooved rubber pad 5 mm thick	250 Nos. per PWI	250 Nos. per PWI
15	GFN liner	200 sets per PWI	200 sets per PWI
16	Metal lines	400 sets per PWI	400 sets per PWI
17	ERC Clips	1000 Nos. per PWI	1000 Nos. per PWI
18	ERC-J Clips	100 Nos. per PWI	100 Nos. per PWI
19	Retro reflective speed boards (20,30,45& 75)	1 set for each PWI	1 set for each PWI

NORTH WESTERN RAILWAY

Annexure-IV

Scale of P.Way material/T&P to be handed over by Construction Organisation to Open line while handing over projects (excluding equipments at level crossings)

T&P

Sr. No.	Items	Quantity to be handed over for NL and GC	Quantity to be handed over for doubling
1	Insulated track gauge with spirit level	2 Nos. per beat	1 No. per beat
2	Hydraulic zim crew	1 No. per beat	1 No. per beat
3	PWI tool kit	1 for each SPWI	1 for each SPWI
4	Toe load measuring device	2 Nos. for each PWI	1 No. for each PWI
5	BG push trolley with umbrella	1 Nos. for each SPWI& PWI	1 No. for each PWI
6	BG motor trolley	1 Nos. for each sectional ADEN	1 No. for each sectional ADEN
7	Portable rail drilling machine	2 Nos. for each PWI/C	1 No. for each PWI/C
8	Portable rail cutting machine	2 Nos. for each PWI/C	1 No. for each PWI/C
9	Dip lorry sets BG	2 sets. for each PWI/C	1 set. for each PWI/C
10	Track lifting jack	4 Nos. per SPWI	2 Nos. per SPWI
11	Rail Thermometer	2 Nos. per SPWI	2 Nos. per SPWI
12	Rail dolly	2 Nos. for each PWI/C	2 Nos. for each PWI/C
13	Chamfering kit	1 Nos. for each PWI/C	1 No. for each PWI/C
14	Spanner 90R/52Kg/60 Kg	2 Nos. per key man	2 Nos. per key man
15	Wooden mallets	10 Nos. per PWI	10 Nos. per PWI
16	Box spanner	2 Nos. per gang	2 Nos. per gang
17	Hydraulic rail tensor	1 No. per PWI	1 No. per PWI
18	Portable rail profile grinder	2 Nos. per PWI/C	1 No. per PWI/C
19	Power pack weld trimmer	2 Nos. per sub division	1 No. per sub division
20	Rollers for de-stressing	100 Nos. per PWI	100 Nos. per PWI
21	SKV welding equipment set	1 Set per PWI	1 Set per PWI

Annexure – S&T

Joint Procedure Order for S&T works

1.0 S & T Works:-

1.1. Guidelines for signalling projects issued vide CSTE's letter no. SG/184/1/ Vol.-III dated 10.03.2011 shall be implemented (Enclosed as per Annexure S&T-I). Policy guidelines issued from time to time by Railway Board/RDSO etc. shall be adhered to.

1.2. Pre-commissioning check list of various electronic signalling equipments like EI, IPS, BPAC, Data loggers, LED etc. issued by RDSO is to be filled in during execution of work. A copy should be submitted to Sr. DSTE.

1.3. Check list of items (No. S&T/2010/2/Check list, enclosed as Annexure S&T-II) to be ensured in signalling construction works must be ensured before taking up the NI. A copy of the duly filled in check list should be submitted to Sr. DSTE.

1.4. Joint inspection by open line & construction officers should be taken-up before NI to check the status of implementation of Para 9.1 & 9.2 above.

1.5. The Construction Organization shall provide in advance the IRCA units/ DISTU calculations duly vetted by associated finance for the additional S&T assets being created, to Sr. DSTE so as to process for creation of posts. Open line will process for creation of posts and filling up of vacancies before the CRS inspection.

1.6. Construction shall organize training of open line sectional staff and officers in the new technology items. The technical manuals and other literature of the equipments shall be handed over for smooth maintenance of the same after the section is commissioned.

1.7. Handing over/Taking over of newly created signalling assets.

(a) **Provision of adequate maintenance spares / modules/ equipments**: - Provisions of adequate numbers of spare modules & equipments should be made as per this office letter No SG/184/1/Vol-II dated 16.8.2010 as well as guidelines issued from Railway Board/RDSO (Enclosed as per Annexure-S&T-III).

(b) **The Plans and documents** for new S&T works, as detailed in Para No. 20 of procedure orders for handing over/ taking over of newly created signalling assets issued vide Railway Board's letter No. 2005/SIG/SEM/5 dated 18.11.2005 shall be handed over to open line.

(c) To ensure smooth handing over /taking over of signalling assets the procedure order circulated vide CSTE's letter No. SG/184/1/Vol 1 dated 03.12.2009 in conjunction with guidelines contained in Para – 9.5 Correction Slip No. 5 of SEM Part-1 1988 edition are to be followed (Enclosed as per Annexure S&T-IV).

(No. SG/PR/Const Date 17.06.2011)

DA: Annexure S&T-1 to S&T- IV

CSTE/C/JP 17/6/11

CSE/NWR 17/6/11

Annexure-I (183) S&T

NORTH WESTERN RAILWAY

Headquarter Office.
Jaipur.
Date 10.03.2011

No. SG/184/1/ Vol.-III

All Sr. DSTEs,
All Dy. CSTE/Cs,

Sub: - Implementation of Guidelines in Signalling Projects.

*****

The planning & execution of signalling projects has to be in accordance with the guidelines issued time to time by Railway Board and by this office. However, it is seen that planning of projects/works from its initial stage of survey & estimation followed by tendering and execution are not in-accordance with these guidelines. To have uniformity in the implementation of S&T works, following major guidelines are once again reiterated:-

I) Following minimum signalling arrangements to be provided in all projects:-

i) Provision of LED Lamps: - All the signals shall have provided with LED signal lamps as per latest RDSO specification. The pre-commissioning check list shall be filled before commissioning.

ii) Provision of Reliable Power Supply:-

a) Provision of IPS: - All the stations up-to 6 lines, shall be provided with IPS with number of modules and their rating/capacity as per RDSO spec. No. RDSO/SPN/165/2004 (or latest amendments) with the load calculation to be carried out as per Para 1.3 of Railway Signalling Installation and Quality Handbook, catering the signalling load of the station. The pre-commissioning check list shall be filled before commissioning of IPS. The surge & lightning protection devices of Class B & C are integral part of RDSO specification for IPS, and it shall be ensured that these SPDs are installed along with installation of IPS.

b) Discrete Power Supplies of Major Junction Yard:-For major yards, discrete power supplies shall be provided and the power diagram indicating the adequate capacities of battery banks and their corresponding battery chargers of sufficient capacity to cater for signalling load as well as maximum battery charging current with standby arrangements and same shall be approved by CSTE/NWR office before execution. It shall be ensured that Surge & lightning protection of Class B & C shall be installed along with installation of discrete power equipments.

Note:- Provision of Lightning & surge protection devices:- Lightning and surge protection devices shall be provide as per RDSO specification no. RDSO/SPN/144/2006 (Revision-2 or latest) to have stipulated safety and reliability requirement for signalling equipments.

iii) Provision of Data Loggers:- All MACLS installations shall have provision of Data loggers of adequate capacity (including spare logging capacity) to catering of logging of status of all the relays installed including status of relays of block instrument, Axle counters, status of IPS through potential free contacts, DG set start/stop, Relay room door and analog signal monitoring etc. All the Data loggers should be provided with computer & printer so that various reports can be generated at site. The validation of data loggers and logic for analytical software for generation of Exception report shall be checked completely. Networking of Data Loggers shall be integral part all contracts with satisfactory performance upto Divisional control. The pre-commissioning check list shall be filled before commissioning of Data Logger.

iv) Provision of BPAC: - All installations are to be provided with Tokenless block instrument with BPAC. Digital Axle counters shall be provided with adequate spares and toolkit for maintenance. The pre-commissioning check list shall be filled before commissioning of BPAC.

v) Provision of maintenance free Earth & bonding plan:- Practice to be adopted for the installation of Earthing and Bonding system for Signalling Equipments shall be as per RDSO letter no. STS/E/SPD dated 19.09.2008 or latest. A typical sketch for Earthing & Bonding arrangements to be followed is enclosed herewith.

vi) Provision of DG sets/ Solar panels for reliable power supply:- Two numbers of self-start, silent single phase /multi-phase DG sets of adequate capacity are to be provided depending upon the per phase signalling load of the station. Also suitable solar panel with one stand by DG set can be provided in lieu of Two DG sets where availability of sun light is good.

vii) Provision of Fire–fighting equipments and fire detection and alarm system: - Fire–fighting equipments and fire detection and alarm system shall be provided as per SEM- Part-II Para 21.18.2, in the relay room/equipment room.

viii) Provision of Fuse Alarm & Automatic Changeover System: - Fuse alarm & automatic changeover system shall be provided in the relay room so as to have immediate report of the fuse blown off and thereafter automatic changeover of the fuse blown off.

ix) Provision of Earth Leakage Detector: - All MACLS installations shall have provision of Earth Leakage Detector of adequate channel capacity to monitor the status & health of various power supplies along with their respective cables carrying these power supplies.

x) Provision of Electric Lifting Barrier: - Electric lifting barrier along with other safety devices of LC gates shall be provided as per correction slip no. 06 of SEM Part II.

xi) RE compatibility of the MACLS installation: - MACLS installations going to be provided in the sections mentioned in the Railway Boards letter no. 2000/RE/161/11 dated 01.05.2007 & 2008/SIG/RE (Works) dated 25.06.2008 should have provisions of RE compatibility so as to avoid duplication of S&T works and no major signalling activities is required for the transition from Non-RE to RE.

xii) Provisions of adequate spare modules & equipments: - Provisions of adequate numbers of spare modules & equipments should be made as per this office letter no. SG/184/1/Vol-II dated 16.08.2010 as well as guild lines issued from Railway Board/RDSO.

xiii) Provision of warranty and AMC/ARC of EI, Data logger, IPS, BPAC, DG sets:- All tender/contracts shall have explicit provisions of warranty period as well as AMC/ARC periods of the equipments along with the complete scope of items of schedule to be carried out in AMC/ARC. Same shall be communicated to Division with the handing over of installation.

Note: - The warranty period in case of EI & other Electronic equipments like IPS, BPAC, Data Loggers & DG sets etc. should be minimum one year. Also provision of AMC/ARC of Electronic Interlocking, IPS, BPAC & Data loggers etc. to be kept for minimum 03 years.

In case of any deviation from above mentioned note, prior approval of CSTE/NWR should be taken.

xiv) Provision of Training of S&T official in the contracts: - All tender/contracts shall have explicit provisions of training of S&T officials for new signalling technology like EI, IPS, BPAC, Data Loggers etc.

II) Preparation of Estimates:-

Estimates prepared shall contain the provisions of the above mentioned signalling arrangements along with the requisite number of spares. Also provision of AMC/ARC of Electronic Interlocking, IPS, BPAC &, Data loggers etc. to be kept for minimum 03 years.

III) Approval of Signalling Scheme of Bypasses and Major yards/Junction yards:-

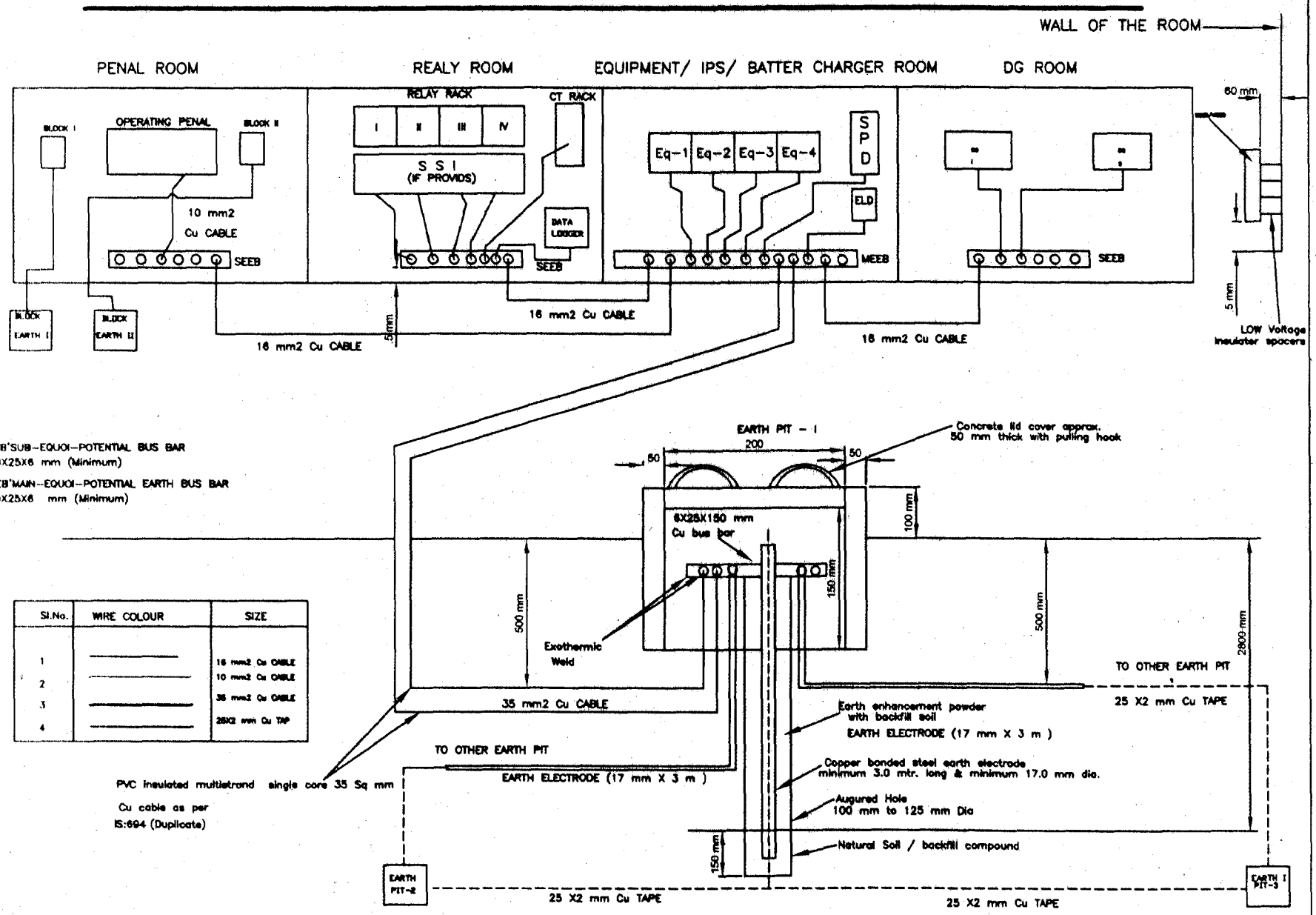
The scheme & planning of provision of signalling of Bypasses lines and Junction/Major yard shall be got surveyed pointing out any special features of the Bypass or Junction/Major yards and the signalling scheme & planning report shall be got approved by CSTE/NWR in principle at its initial stage before finalization of estimate etc. Anywhere additional operating panel is required for operation of Bypasses or Junction/Major yards etc. then specific approval of CSTE/NWR & COM/NWR is to taken for every case. In addition, approval on SIP is also to be taken from CSTE/NWR.

The above guidelines shall be followed in all the cases with immediate effect.

Mehta
10/3/11

(Mahesh Mehta)
CSTE/NWR

Copy to:-
CSTE/C: - For information & necessary action.


RLY TRACK
WALL OF THE ROOM
PENAL ROOM
REALY ROOM
EQUIPMENT/ IPS/ BATTER CHARGER ROOM
DG ROOM
BLOCK I
OPERATING PENAL
BLOCK II
10 mm2
Cu CABLE
SEEB
RELAY RACK
CT RACK
I
II
III
IV
S S I
(IF PROVIDS)
DATA LOGGER
SEEB
Eq-1
Eq-2
Eq-3
Eq-4
SPD
ELD
MEEB
SEEB
60 mm
5 mm
LOW Voltage
Insulator spacers
BLOCK
EARTH I
BLOCK
EARTH II
16 mm2 Cu CABLE
16 mm2 Cu CABLE
16 mm2 Cu CABLE
SEEB'SUB-EQUOI-POTENTIAL BUS BAR
150X25X6 mm (Minimum)
MEEB'MAIN-EQUOI-POTENTIAL EARTH BUS BAR
300X25X6 mm (Minimum)
EARTH PIT - I
Concrete lid cover approx.
50 mm thick with pulling hook
200
50
50
100 mm
6X25X150 mm
Cu bus bar
150 mm
500 mm
500 mm
2800 mm
Exothermic
Weld
TO OTHER EARTH PIT
35 mm2 Cu CABLE
25 X2 mm Cu TAPE
Earth enhancement powder
with backfill soil
EARTH ELECTRODE (17 mm X 3 m)
TO OTHER EARTH PIT
EARTH ELECTRODE (17 mm X 3 m)
Copper bonded steel earth electrode
minimum 3.0 mtr. long & minimum 17.0 mm dia.
Augured Hole
100 mm to 125 mm Dia
Natural Soil / backfill compound
150 mm
PVC insulated multistrond single core 35 Sq mm
Cu cable as per
IS:694 (Duplicate)
EARTH PIT-2
EARTH PIT-3
25 X2 mm Cu TAPE
25 X2 mm Cu TAPE
Sl.No.
WIRE COLOUR
SIZE
1
2
3
4
16 mm2 Cu CABLE
10 mm2 Cu CABLE
35 mm2 Cu CABLE
25X2 mm Cu TAP

Check List of Items to be Ensured in New Construction Works

(No.S&T/2010/2/Check List)

(Answers to all items should be "Yes")

Sr.No.	Item	Yes/No
	A. SIGNAL	
1.	LED ECRs are used.	
2.	AC lit LED signals are used.	
3.	All aspects of distant signals are having double leads.	
4.	All signal units are provided with pad locks.	
5.	No signal including signal foundation is infringing as per SOD.	
6.	Maintenance platforms are available on the signals.	
7.	Signalling cable enters calling on/shunt signal units below the main signal with armoury.	
8.	The wires connecting LED signal unit have been twisted as pair and colour code is maintained.	
9.	Marker i.e. "C", "P", "G" etc. are of standard size and colour scheme and are tightened by two nut bolts.	
10.	If any signal is provided on right side then it is with due approval as per GR 3.01(i). Arrow mark has been provided on such signals.	
11.	Implantation from the centre of the track is painted on the signals.	
12.	Signal ladder on the signals between two tracks is narrow and with blanker at proper height.	
13.	Signals are in plumb and no cable is exposed. Foundation nut bolts are in tight condition.	
14.	Height of the independent shunt signal should be uniform and have proper pad locks.	
15.	Shunt signals are provided with proper arrows.	
16.	Signal & shunt signal numbers are painted properly on the signals.	
17.	Signals are located at adequate distances from point, LC gate and signals as per the SIP.	

18.	Height of the signals is proper.	
19.	Painting of the signals is available as per the norms with cross-painted on the back side.	
B. POINTS		
1.	The point machine is IRS type.	
2.	The long sleepers are in good condition.	
3.	Point machine is secured by proper size bolts and their heads are below the sleepers.	
4.	Ground connections are having proper size pins without play and the "D" brackets bolts are provided with castle nuts.	
5.	RDSO type ground connections are used.	
6.	Gauge type plate and william stretcher bar are properly fitted and proper insulation is provided.	
7.	'L' joints of William stretcher bar are sufficiently away from sleeper and there is no possibility of rubbing with sleeper.	
8.	Slipping current is between 1.5 times to 2 times the normal operating current or as specified by the manufacturer.	
9.	WJR timing is 10 seconds.	
10.	The on load voltage available on the point machine is minimum 90 V.	
11.	Parallel cable conductors 2/3/4 are used to achieve item No. 10 above.	
12.	Point operation and detection circuit is as per latest HQ's typical circuit issued vide letter no. SG/42/NWR/HQ dated 18.9.09.	
13.	The armoury is opened inside the ME-BOX & point machine, and secured properly.	
14.	All the rods of ground connection are provided with check nuts.	
15.	Point protection covers are provided on the ground connection.	

16.	Packing of sleepers is proper and there is no flashing of point below the train movement.	
17.	The detector slides should be so adjusted that detector contacts just make with 1.6 mm test piece and break with 3.25 mm test piece.	
18	Essential requirements before interlocking the points as per SEM Part II para 12.40 have been fulfilled by the P.way supervisor.	

C. TRACK CIRCUITS

1.	Initial Measurements have been duly recorded.	
2.	Track circuits should fail in battery disconnection condition.	
3.	QT2 type track relays are used with QSPA1 as repeaters.	
4.	Insulated Liners are available on all PRC sleepers.	
5.	Double bonding is provided.	
6.	All lead wires from boot leg to rail are properly secured and are taken through insulated pipes.	
7.	ND type fuses of proper capacity 2 Amp. for TF and TR are provided.	
8.	'J' type pendrol clips are provided on glued joint sleepers.	
9.	Glued joints are of good quality with 10 mm end post and the value of the glued joint should not be less than 25 Mega ohms with 100 volt megger.	
10.	IBJ (if any) are properly fixed with holes of the fish plates matching with holes of rails. The end of rail cut should be proper for end post.	
11.	Free rail should be available on either side of the IBJ.	
12.	ALL PRC sleepers are fit for track circuiting i.e. insulation value is not less than 500 Mega ohms.	

D. LOCATION BOX		
1.	Location boxes are fixed perpendicular to track and their doors when open are clear of infringement. Door stoppers may be used if required.	
2.	Location details are painted on the cover of the location box.	
3.	Proper space around the location box is available for the maintainer for carrying out the maintenance work.	
4.	Masonry/sand filling is done inside of the location box to prevent the entry of the reptiles.	
5.	In location, all spare conductors are also terminated.	
6.	All M6 terminals are properly secured with the help of nuts and bolts on hylum sheet.	
7.	All location boxes are provided with E type lock arrangement of same ward No., generally 11.	
8.	Lighting arrangement is available inside the location box.	
9.	Wiring and termination of cable inside location box is properly laced and dressed.	
10.	Location box is fitted with proper gasket.	
11.	Location box & battery box is painted as per the extant norms.	
12.	Equipments are spaced properly with proper working space available for the Maintainer.	
13.	The cable armoury and equipment are properly earthed.	
E. DIGITAL AXLE COUNTER		
1.	Initial measurements have been duly recorded.	
2.	The Pre-commissioning check list is signed.	
3.	The DC-DC converter is separate and fit for axle counter usage.	
4.	Voltage on axle counter at site is correct (>24-28V).	
5.	The axle counter channels are brought in 4/6 quad cable.	

6.	QN1K 1000 ohms relays are used for PPR, VPR relays and also at location of PR circuit.	
7.	The deflectors provided are not very near to the track devices.	
8.	The cable for the TX & RX has been brought in different HDPE pipes.	
9.	The resetting arrangement is effective and counters provided for axle counter are functioning properly.	
10.	Separate earth is available for the axle counter location equipment with less than 1 ohm value.	
11.	BPAC reset circuit is provided as per HQ's letter no. SG/42/NWR.HQ Vol.II dated 01.4.2010 duly incorporating the joint special instruction issued by CSTE & COM in SWRs.	
F. CABLE		
1.	Meggering sheet is available for all cables, which include telecom and power cables.	
2.	At least 20% spare conductors are available upto the farthest point zone and 10% beyond that.	
3.	Separate cables are used for the functions of Up & Down lines.	
4.	Separate cables are used for calling on and the main signal.	
5.	12 core cable is used for the tail cable between location box and the signal unit.	
6.	Guidelines issued vide HQ's letter no. SG/184/1/Vol-II dated 20.8.2010 and 25.8.2010 are followed for cable laying viz.: **a.** Provision of ring main power supply arrangement is made for external 24 V DC. **b.** Cable is laid in non-inflammable DWC/RCC pipe or in a pre-casted duct between Home signals to Home signal. **c.** Cable is laid in non-inflammable DWC/GI pipe on track and road crossings. **d.** Cable is laid at a depth of 1m parallel to track, for cables laid between Home Signals and at 1m below rail flange while track crossing and at 1.2m depth for	

	cables laid beyond Home signals and Automatic signals area, IBH & LC gates.	
7.	All cable entries have been sealed against rodent's entry with proper glands for cable entry.	
G. RELAY ROOM		
1.	Relay testing is done with the test jig before plugging.	
2.	Double locking arrangement is available on the door of the relay room.	
3.	As far as possible, relays of one make only should be used at a station.	
4.	Relays are having code pins as per relay contact configuration.	
5.	Relay base plate is painted with proper contact configuration to avoid insertion of wrong relay.	
6.	Test board is available in the relay room with facility of testing of all type of relays.	
7.	There is no dry solder on the tag block, base plate and on the fuse block.	
8.	All indicating G-type fuses (0.6, 1.6, & 3 Amp.) are of non deteriorating type and RDSO approved.	
9.	Linonium/Vinyl sheet is available in the relay room.	
10.	8 way terminals are of good quality and are fixed on hylum sheets.	
11.	All 6 mm wires are soldered on 8 way terminal strips.	
12.	All internal wires are from RDSO approved sources, duly inspected.	
13.	Fuses of correct capacity i.e. not less than 2.5 times the rated current, are provided.	
14.	The configuration guidelines issued vide CSTE office letter no. SG/208/1/Vol-iii dated 24-9-10 are followed for all Data logger installations.	
15.	Double glass window is provided in Relay Room.	

H. PANEL ROOM		
1.	All indications are glowing properly.	
2.	All counters on the panels are functioning and are incrementing once.	
3.	All keys are effective including SM's key.	
4.	All buzzers are sounding loudly.	
5.	Acrylic sheet is available on the operating panel with proper holes.	
6.	Spring action of the panel button is in order and it does not stuck up.	
7.	Sealing arrangement for emergency counter/button is proper.	
8.	The RRBU key is inside the panel.	
9.	The colour of the buttons is as per the standard norms.	
10.	Stop collars of sufficient quantity are available.	
11.	Inside KLCR is provided with proper heavy duty push buttons.	
12.	Indication of IPS power supply is available in the ASM room.	
13.	Various control & magneto phones are available in good condition.	
I. POWER EQUIPMENT		
1.	Earth leakage detector is functional.	
2.	IPS is RDSO approved and RDSO inspected.	
3.	Pre-commissioning check list as per RDSO guidelines is signed by Railway representative and company representative before commissioning IPS.	
4.	Lightning and surge protection devices as per standard are provided for IPS.	
5.	Feeder cable between IPS and battery is- 10 sq mm copper for 120 AH battery 16 sq mm copper for 200 AH battery 25 sq mm copper for 300 AH battery	

6.	Exhaust fan is provided in the power equipment room & battery room.	
7.	Fire fighting equipment is provided in power equipment room.	
J. EARTHING		
1.	There is only one earth for signalling equipment room except block earth.	
2.	Earthing is done as per code of practice for earthing of signalling equipments issued by RDSO vide letter no. STS/E/SPD dated 19-9-2008. Salient features of the same are given below: **a.** Earth value is less than 1 ohm. **b.** Extension of earth to equipotential bus bar is provided. **c.** Connection of surge protection devices with equipotential bus bar is with 16 sq mm copper insulated cables	
K. GENERAL		
1.	Precommisioning check list of electronic equipments as per RDSO has been filled in item-wise and duly signed for (i) EI (ii) Axle counter (iii) IPS (iv) Data logger (v) LED Signal	
2.	Sealing of panel, counters, block instruments, KLCRs, EKTs etc. is proper.	
3.	Quad cable testing is done and measurements are duly recorded. • Loop resistance recorded • Meggering is done • Armour earthing is done.	

***** End *****

24.11.10
Dy CSTE/KJ/NWR

172
161
Annexure: S&T/III

NORTH WESTERN RAILWAY

Headquarter Office
Jaipur
Date: 16.8.2010

No: SG/184/1/Vol-II

Sr. DSTE/All, BKN, JP & JU

Sub: Maintenance of signalling gears :- Arrangement for spare material/cards

Ref: This office letter No. SG/236/Vol XIII dt. 28.7.10 & 9.8.10

****

Modern signalling items like Electronic Interlocking, Digital Axle Counters, IPS, LED signals and Data loggers are being provided progressively on Colour light signalling installations. In case of any fault/defect in equipments card/assembly needs to be changed quickly for minimizing mean time to repair (MTTR) which is very important. RDSO's specifications for these items generally stipulates 10% spares to be kept for maintenance. This must be ensured. The spare unit/cards should be kept at all important stations and HQ stations of JE/SE(Signal) for meeting urgent requirements for quick fault restorations.

2. Based on the signalling failure analysis prepared by Dy.CSTE/Signal, some of the critical unit/cards which have been experienced to be requiring more frequent usage are listed in the enclosed statement. It is further suggested that minimum one unit of each such items be kept at each station additionally just like keeping conventional items like relays of various types, fuses, wires/ cable pieces etc. so that maintenance and fault restoration becomes more efficient.

DA: As above

16/8/10

(S.B. Bhamu)
Chief Signal Engineer

SC

Critical Signaling Spares to be kept at each station:

1. SSDAC – Modem cards, Tx & Rx Coils
2. LED Signal – Current Regulators
3. IPS – SMRs, DC-DC Converters
4. Contingent Power Supply Arrangement – Battery Chargers (110V), Transformers (110V)
5. Track circuit - Track feed chargers, Regulating resistance
6. Relays of various types
7. Signaling Cables, Power Cable, Quad Cable
8. Point machines & ground connections – At alternate station
9. Token-less block instrument - BCB pusher cards
10. Fuses of various capacities

16-8-10
Dy.CSTE/Sig/NWR

(170)

(7)

Urgent

NORTH WESTERN RAILWAY

Headquarter Office
Jaipur

No: SG/236/Vol-XII **Date: 28.7.2010**

Sr.DSTE/AII, BKN, JP & JU
Dy.CSTE/C/JP, BKN, AII

Sub: Improvement in reliability of IPS

Ref: RDSO's letter No. STS/E/IPS/Genl dated 07.07.2010

****

Enclosed herewith please find a copy of RDSO's letter referred above, regarding measures and precautions to be taken while IPS installation & commissioning as well as its subsequent maintenance. Necessary action may be taken to ensure strict compliance of the RDSO's guidelines mentioned therein.

The pre-commissioning checklist for installation of IPS (issued by RDSO) was already circulated which has again been emphasized. Provision of good quality earth, wiring of potential free contacts in IPS to data logger, Annual Repair Contracts (ARC) and training of maintenance staff etc. all measures as detailed in the RDSO's letter under reference may be implemented in letter and spirit for improvement in reliability of IPS.

Action taken be advised to this office.

DA: As above

28/7/10.

(S.B. Bhamu)
Chief Signal Engineer
NWR/Jaipur

Copy to : CSTE/C/JP for information and necessary action in all works commissioning.

26

(69)

(31)

NORTH WESTERN RAILWAY

Headquarter Office,
Jaipur.
Date 9.8.2010

No. SG/236/Vol-XIII

Sr. DSTE-AII/BKN/JP & JU.

Sub: Improvement in reliability of IPS.

Ref: This office letter of even no. dated 28.7.10

*****

Vide letter referred above, guidelines were issued regarding measures and precautions to be taken for improvement in reliability of IPS. Feedcack on the action taken has not been received from divisions. The same should be advised immediately as it is essential to implement these guidelines in order to avoid catastrophic failures of IPS.

RDSO's letter no. STS/E/IPS/Genl. Dated 7.7.10 which was circulated to divisions vide letter referred above, also stipulates about spare modules to be provided for IPS as given below:-

A. Spares to be kept at station where IPS is installed:

(i) Minimum 10% spares of all modules or one DC-DC converter module each for critical cirtuits.
(ii) One SMR
(iii) One Inverter
(iv) One AVR
(v) One Transformer module

B. Further 10% spares of each module based on total population in the division, should also be kept at suitable/central location.

In all new installations commissioned by construction, spares as above should be catered by them and handed over to division. Shortfalls in the existing installation should be made good through procurement by division.

9-8-10

(A.K.Sharma)
Dy.CSTE/Sig.
for CSTE/NWR/JP

C/-
CSTE/C

27

Annexure – S&T/ IV (168)

Headquarter Office
Jaipur

No: SG/184/1/Vol 1 Date: 03.12.2009

Sr. DSTE/AII, BKN, JP & AII

Sub : Procedure order for handing over /taking over of newly created signaling assets.

Ref: i) Jt. Director/Sig/Railway Bd's letter No. 2005/SIG/SEM/5 Dated 18.11.05
ii) This office letter No. SG/184/1 dated 1.12.2005

***

Vide above referred letter procedure order for handing over/taking over of newly constructed signaling assets was circulated for implementation. However, it is observed that the procedure laid down under the referred letters is not being followed.

The photocopy of the above referred letters is enclosed here with for your ready reference and you are advised to follow the procedure order strictly and no deviation shall be accepted unless prior approval of undersigned has been taken for it.

DA: As above

(Mahesh Mehta)
CSTE/NWR/JP

Copy to : CSTE/C/JP : For information and necessary action.

28

INDIAN RAILWAY SIGNAL ENGINEERING MANUAL PART I
(1988 EDITION)

Addendum and Corrigendum Slip No.5.

Chapter IX , Section A

(i) Para 9.5 be renumbered as 9.4.3. The name of para 9.4 "Responsibilities of Engineer Incharge" be changed to "Responsibilities of Engineer Incharge/Inspector Incharge".

(ii) A new para 9.5 "Joint Inspection/Handing over of new assets" be added as follows:-

"9.5 Joint Inspection/Handing Over of new assets.

9.5.1 Joint inspection by Divisional open line and construction organization both at supervisor & officer level shall be undertaken before taking up Non-interlocking of a station in connection with yard re-modelling/ interlocking changes or commissioning of signalling work for a new line/gauge converted line.

The non interlocking of the station / commissioning of signalling work for a new line or gauge converted line shall be undertaken after the items considered essential for safety of tram operation are completed.

9.5.2 Within 15 days of commissioning of Signalling works, another Joint inspection both at Supervisor & Officer level by Divisional Open line and Construction Organisation shall be undertaken. The deficiencies noted during these inspection shall be listed in two categories:-

Category A - Items which shall be complied before handing over.

Category B - Items which may be complied after handing over as per a MOU to be entered between open line and construction organisation.

9.5.3. All the new signalling equipments and associated gadgets shall be handed over /taken over within 2 months period after commissioning of the signalling works. After expiry of 2 months period, these equipments and associated gadgets shall be deemed to have been taken over by the open line of the railway and thereafter the responsibility of maintenance shall devolve on Divisional open line organisation.

9.5.4. In order to ensure that handing over / taking over of signalling assets is accomplished in a smooth manner, a specific handing over/ taking over procedure may be jointly issued by CSTE & CSTE (C) to bring out the items to be complied as per para 9.5.1 and 9.5.2.

433

North Western Railway

Headquarter Office,
Jaipur

No: SG/184/1

Date: 01.12.2005

Sr.DSTE/AII, BKN, JP & JU

Sub: Procedure order for Handing Over/Taking over of newly created Signalling assets.

Ref: Jt.Director(Sig)/Rly. Bd.'s letter No. 2005/SIG/SEM/5 dt. 18.11.05

***

Please find enclosed herewith a copy of procedure order for handing over/taking over of newly created signalling assets, received from Railway Board vide their letter under reference. The procedure order may be followed strictly, and no deviation shall be accepted, unless prior approval of this office has been taken for the deviation.

01.12.05

(M.L. CHAHAR)
Dy.CSTE/Sig
for CSTE/NWR

DA: As above

C/- CSTE/C/Jaipur

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No.2005/SIG/SEM/5 New Delhi, dtd. 18-11-2005

General Manger (S&T),
All Indian Railways.

Sub: **Procedure Order for Handing Over/Taking Over of Newly Created Signalling Assets.**

With reference to above subject please find enclosed herewith the Procedure Order for Handing over/ Taking Over of newly created Signalling assets for information and necessary action.

DA: As above.

(P.K. Gupta)
Jt. Director(Signal)
Railway Board.

(431) 25

Procedure Order for Handing Over/Taking Over of Newly Created Signalling Assets.

1. Dy.CSTE/C in charge of the work in field shall submit the programme of commissioning the works during the year to Sr.DSTE of the division in the beginning of the financial year.

2. The works shall be carried out as per the standard drawings, extant instructions and the quality manual/guidelines. Any deviation from the extant instructions will require the approval of CSTE.

3. The Station Working Rules (SWR) shall be prepared by the concerned Construction Officer and signed by the Divisional S&T and Operating Officers.

4. All the works to the extent possible should be completed during pre non interlocking period (Pre NI). Outdoor works such as preparation of ground connections and fixing of point machines on points and its testing, re-allocation and termination of cables, re-allocation of outdoor signalling gears etc. shall invariably be completed by the construction wing after taking dis-connection/block. The re-connection of the existing gears shall be given only after the gears have been fully tested by the concerned maintenance staff of open line so as to ensure that the gears are in proper safe working condition.

5. CSTE/C shall discuss the modalities with CSTE/OL before non-interlocking of major station yards for signalling works. Similarly, for medium and wayside stations the Dy.CSTE/C shall discuss the modalities of the works to be done during NI period with Sr. DSTE in charge of the concerned division.

6. No major work shall be undertaken by the S&T construction organisation inside the relay room/cabin basement at any station unless the maintenance of signalling equipment at the station is taken over by construction organisation. The maintenance in such cases shall extend to all signalling gears in the yard. However, minor alterations inside the relay room/cabin basement etc. can be undertaken in presence of the maintenance staff of the Open Line without taking over the maintenance of the station.

7. When maintenance is taken over by the construction organisation all the maintenance staff for that station shall be put under the administrative control of the construction organisation for the period during which the maintenance is taken over.

8. During the period the maintenance of the station is with the construction organisation, it shall be responsible for safe working of gears. All safety instructions issued from time to time shall be scrupulously followed by the construction staff. Dy. CSTE shall analyse all the signal failures at the stations under his maintenance and keep the Sr.DSTE of the division informed about the causes of failures and corrective action taken.

9. The Open Line Inspectors and Officers shall associate themselves during the construction stage of the new works with a view to acquaint themselves with the works and also point out any deficiency that is required to be removed in the interest of proper functioning of the gears. The observations shall be jointly agreed and recorded in the 'Site Inspection Register' to be kept at the station for this purpose.

10. No work shall be done in the existing location boxes without the presence of Open Line maintenance staff.

11. The cable route plan should be got approved from the division before undertaking the work of trenching & cable laying. Instructions laid down in the joint procedure order issued by the Board vide letter No. 2004/Sig./G/7 dt. 17.12.2004 should be followed meticulously.

12. Power supply equipment proposed to be installed by construction organisation for the works shall be in accordance with the latest policy/circular/instructions issued from time to time. For any deviation, approval of CSTE/OL should be taken.

13. The open line organisation shall carry out the cable insulation test, power supply auditing and the functional tests before permitting the construction organisation to start the non interlocking working. In case any alteration is done in the wiring diagram by the construction staff after carrying out the final functional test by the open line staff, this shall be brought to the notice of open line officials for conducting the test again on the altered portion.

14. Construction organisation shall complete the requisite work in all respect and carry out the continuity test, wire count, break down test and the functional tests before offering the installation to the open line for joint tests.

15. Sr. DSTE shall plan the positioning of the maintenance staff immediately after the construction organisation gives the programme of commissioning for the year. It will help positioning of staff well in time so that maintenance of the station can be taken over immediately after commissioning.

(450) 259

16. Record of functional test carried out on a selection table/locking table, contact break down test and continuity test shall be submitted to Open line immediately after commissioning. Open line official shall keep these documents at the respective station in a sealed packet carrying the details of the documents and signature of Sr.DSTE/DSTE of the division

17. The details of the works undertaken at the stations shall be advised by the construction organisation to the concerned Sr.DSTE of the division in advance. Dy.CSTE/C and Sr.DSTE of the division shall have periodical meetings to review the progress of ongoing works and decide the dates of joint inspection of the works nearing completion. Minutes of such meetings shall be recorded jointly.

18. Within 15 days of commissioning of Signalling work, joint inspections at officers level by Open Line and Construction organisation shall be undertaken The deficiencies noted during this inspections shall be listed in two categories as under :

Category –A : Items that shall be complied before handing over.

Category – B : Items that shall be complied after handing over with the target dates.

19. Sr.DSTE of the division shall ensure that Open line staff actively associate with the construction activities particularly in the following areas :

i) Site plan and size of RRI/Panel
i) Cable Route Plan and cable laying
ii) Signal locations
iii) Power supply sources and equipment plan
iv) Cable testing.

20. While handing over the maintenance of the works executed by the construction organisation, the following completion documents and maintenance accessories shall be handed over to the division. All the drawings should be in standard size as laid down in Para 8.3.4of Signal Engineering Manual Part I, Addendum of Corrigendum Slip No. 4 :

i) Approved SIP of the station
ii) Completion wiring diagrams
iii) Selection/interlocking table and Dog-Chart
iv) Panel diagram in case of panel stations
v) Sighting Committee certificate on proper Performa as per SEM

vi) Cable route plan
vii) Cable termination plan in relay room and location boxes.
viii) Wire counts details in case of RRI
ix) Power supply arrangement plan
x) Cable insulation test record
xi) Signal infringements at the station
xii) Track circuit bonding plan
xiii) Battery history card, track circuit test card and earth resistance measurement record.
xiv) The tools and plants and spares.
xv) 3 sets of CDs containing all completion drawings.

One laminated copy of the documents mentioned at i, ii, iii, vi, vii, ix, x, xi, xii, xiii above shall be kept at the station for reference of the maintenance staff

21. The safety certificate shall be made over to the Division at the time of handing over of the maintenance of the station. In addition, technical documents of the new equipment, if installed, shall also be handed over.