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GOVERNENT OF INDIA
MINISTRY OF RAIWAYS
(RAILWAY BOARD)

No.2009/Safety(A&R)/26/4 New Delhi, dated 11-8-2010

GMs,
All Zonal Railways.

Sub:- Blanking of Signals–Back up Power Supply.

Ref:- 1. Adv/Signal/Railway Board's letter No. 2002/SIG/A/Misc. Dt. 25.9.09 & 28.07.10 addressed to CSTEs.
2. Adviser/Safety/Railway Board's letter No. 2007/Safety (A&R)/3/2 dated 14.10.09 addressed to COMs & CSOs.

Vide Board's above referred letters Railways were asked to ensure availability of adequate standby power supply for Signals at all stations including block huts in both electrified and non-electrified territories.

The replies received from the Railways indicated that on most of the Railways works are required to be undertaken or are under progress for achieving adequate back up power supply. On a check at Phaphund station of North Central Railway, it was revealed that Auto-Changeover between the two AT supplies had not been provided.

The power supply arrangements to be made at stations both in electrified and non-electrified areas have been enumerated in the Chapter XVI of the Signal Engineering Manual Pt.II (copy of relevant pages enclosed). — S.N. 32

Railways are advised to get station wise check of power supply conducted and list out deficiencies on account of non provision of equipment or due to equipment lying defective. The same shall be brought to the notice of the respective departments and followed up for sanction of work for provision of equipment or for rectification of the faulty equipment as the case may be.

कृपया जारी करें
दीपचन्द
12-8-10

रेल मन्त्रालय
Ministry Of Railways
रेलवे बोर्ड
Railway Board
हस्ताक्षर सहित जारी
Signature
जारी की तिथि 13.8.10
Date of Issue

(Kamlesh Gupta)
Adviser Safety

DA: As Above
N.O.O.
Copy to :

CSOs, All Zonal Railways - This issue will be discussed in the CSOs conference to be held in September.

CHAPTER -XVI

POWER SUPPLY ARRANGEMENTS

16.1 GENERAL

16.1.1 Power supply arrangements for different types of signalling installations shall be in accordance with policy approved by the Chief Signal and Telecommunication Engineer of the Railway.

16.1.2 Primary cells may be used for signalling circuits where either there is no power supply or it is very unreliable and the current drawn is small. Wherever possible solar panel (s) in conjunction with secondary cells of suitable capacity may be provided.

16.1.3 At all other locations, Secondary Batteries of appropriate capacity shall be provided for signalling circuits.

16.1.4 Normal power supply for signalling installations shall be 230V AC (single phase) 415 AC three phase or any other supply may be used with the specific approval of the Chief Signal and Telecommunication Engineer of the Railway to meet any specific requirements.

16.1.5 Power supply system shall be such that fixed stop signals for approaching train do not become blank when main power supply source fails.

16.2 SOURCES OF POWER SUPPLY

16.2.1 Railway Electrified Area.

16.2.1.1 Electric supply for signalling and telecommunication installations in RE areas shall normally be provided through auxiliary transformers (ATs) of suitable capacity by tapping 25KV OHE

16.2.1.2 On double/multi line sections, the power supply shall be drawn from 25KV OHE through ATs provided on up and down OHE lines separately. It shall be ensured that supply from at least one AT is available in the event of power block.

16.2.1.3 On single line section where power supply is drawn from a single AT, a DG set of suitable capacity shall be installed.

16.2.1.4 At stations where local power supply is also available, it shall act a stand-by source of power supply.

16.2.1.5 In big yards, DG sets of adequate capacity shall be installed in addition to supply from ATs and local source.

16.2.1.6 The power supply from auxiliary transformers (ATs), local source and DG set (s) shall be brought and terminated at a power supply control panel in ASM's office/cabin or at LC gate as required. The power supply control panel shall be provided with the facilities for automatic change over between two ATs. In addition, manual change over facility shall also be provided in the control panel. The power supply control panel, cable (other than from DG room) and other associated arrangements shall be provided and maintained by Electrical Deptt.

16.2.1.7 The supply from the power supply control panel as provided by Electrical Deptt. shall be taken to various S&T locations by S&T Deptt.

16.2.1.8 The supply from the power supply control panel shall be extended through separate MCBs to cabins, LC gates, telecom installations etc. if these are falling within two kms of power supply control panel. For location beyond two kms, a separate set of ATs and power supply control panel shall be provided.

16.2.1.9 DG sets where installed shall be provided with push button start/stop facility from ASM office/ cabin/LC gate as the case may be.

16.2.2 Non Railway Electrified Area

16.2.2.1 For Colour Light Signalling (CLS) installations, power supply shall be drawn from the station feeder. In addition, two standby diesel generators shall be installed. These generators should be of standard make and of adequate capacity for reliable and trouble free service.

16.2.2.2 The output supply of these generators shall be brought to the ASM office and connected to Auto/manual change-over Panel.

16.2.2.3 Solar panels or other renewable source of energy may also be used as power supply.

16.3 DISTRIBUTION OF POWER SUPPLY

16.3.1 The selected supply from the Auto/manual change-over panel shall be distributed to installations/cabins at the station through underground power cables of approved type. Proper capacity HRC fuses/Miniature circuit breakers (MCBs) shall be provided to protect against overload/short circuits.

16.3.2 Visual Indications showing availability of power supplies from various feeders shall be provided for information of the ASM.

16.3.3 230V power which is derived from the auto/manual change-over panel shall be distributed to various power equipments such as transformer-rectifier sets, battery chargers, transformers etc. through a Distribution Panel. Proper capacity HRC fuses/MCBs shall be provided for protection of the equipment against overload etc.

16.4 POWER SUPPLY EQUIPMENT

16.4.1 All power supply equipment such as battery chargers, transformers, voltage regulators, transformer-rectifier sets, inverters, batteries etc. shall be procured as per approved specifications.

16.4.2 Battery chargers for axle counters shall have in-built filters to maintain ripple content below specified value.

16.4.3 Standby power equipment such as battery chargers, transformers, Voltage regulators, Transformer-Rectifier Sets etc may be provided.

16.4.4 Secondary cells of prescribed capacities shall be provided for DC circuits. DC-DC converters with isolated outputs may be used to obtain different voltages from a common Battery-bank.

16.4.5 Integrated power supply system of approved type may be used at CLS installations

16.4.6 Maintenance free cells wherever provided shall be used only with charger suitable for charging maintenance free cells as per approved specification

16.4.7 AC supply for signal transformers shall be derived from a voltage regulator of approved type.

16.4.8 Separate transformer shall be used for feeding signals and track feed chargers.

16.4.9 The current rating of battery charger may be derived from the following formula -

$$\text{Current rating of charger} = \text{Load current} + \frac{\text{AH capacity of cell}}{10}$$

16.4.10 Battery Chargers shall not directly feed the line circuit of Block Instruments.

16.4.11 For operating signal machines of semaphore signals and for their lighting, solar power packs of approved type may be used as far as possible.

16.5 INSTALLATION OF PRIMARY CELLS

16.5.1 Primary cells of approved type may be used in circuits such as those indicated below which do not involve continuous and heavy intermittent discharge:-

a) Electric Key Transmitters;

b) Arm & Light Repeaters;

c) Repeater Circuits;

d) Track/Treadle Circuits (Open type);

e) Single Line Block Instruments - line and local circuits;

f) Double Line Block Instruments - line and local circuits;

g) Tokenless Block Instruments - line circuits;

h) Magneto Phones and annunciators.

16.5.2 Primary cells shall be stored in a cool dry place. The period of storage shall be no longer than absolutely necessary.

16.5.3 When installing primary cells, they shall be located in a dry place which is not subject to extreme heat. For connecting cells, stranded insulated wires of appropriate gauge shall be used. The ends should be skinned and scraped bright to make good connection with cell terminals. Terminals should be firmly tightened. The connected wires shall be neatly dressed.