Signal & Telecom

Role of the Signalling & Telecommunications Department

- Safety in train operations
- Punctuality of running of trains
- Optimum utilization of line capacity
- Passenger amenities
- Providing telecommunication infrastructure for :
    - Safe and efficient operation of trains
    - Administrative voice and data circuits
    - Passenger Reservation System (PRS)
    - Unreserved Ticketing System (UTS)
    - Freight Operation Information System (FOIS)
    - Crew Management System (CMS)
    - Coaching Operating Information System (COIS)
    - Management Information System (MIS)
- Management of Railways Corporate Wide Information System (RAILNET)

Elements of Safety in Train Operation

Track Circuiting

Track circuiting is a basic safety device used in signalling systems. It monitors occupancy of a section of track and prevents clearance of signal in the event of the track section being occupied by another train. This is a fail-safe device, which in the condition of its failure prevents the signals to be cleared.

Axle counters

It is another important safety device used for detecting presence of train in a track section. This device counts the number of train axles entering and exiting through a track section and controls the associated signal.

Block Working

It is an arrangement to control the entry and exit of train in a section called block section between any two adjacent stations. This maintains space interval between two following trains. It provides safety by preventing the second train to be sent into the section between the stations unless and until the previous train has cleared the section.

Driver to Guard communication

Driver to Guard communication has been provided for running trains using VHF walkie-talkie sets, for better co-ordination in controlling of the train.

Interlocking

Interlocking is a mechanism to check the route the train is going to traverse before clearing the signal and to prevent the clearing of signal when it is unsafe for the movement. It eliminates human error and ensures safety in train operations.

Panel Interlocking

Panel interlocking is provided for smaller yards. It is a signalling system, which assures the best standard of safety and eliminates the accidents arising out of human errors.

Safety at Level Crossing Gates

All the level crossing gates in the station area and other important gates in the route are controlled by the signals. These gates are called interlocked gates and provide best safety for the road users. Provision of telephone communication at manned level crossing gates is a safety tool to ensure closure and opening of gates at appropriate time.

Modern Signalling Systems

Computerized/Electronics Interlocking

South Eastern Railway has adopted the state of art of interlocking technology in the form of computer controlled interlocking on Indian Railways. It cuts down installation time and future modifications to cater the need of traffic can be implemented easily.

Digital Axle Counters

Digital axle counters have been provided at various locations in Ranchi division. These axle counters are compact and highly reliable. The Digital Axle counter based Block proving called BPAC is provided over various locations.

Intermediate Block Signalling (IBS)

IBS is provided on trunk routes to increase line capacity by splitting the block section into two parts. Two trains can be accommodated in the Intermediate Block signalling section improving the throughput.

Light Emitting Diode Signals

The conventional Filament type signaling Lamps are replaced with Light Emitting Diode (LED) to enhance the reliability & the visibility of the signals.

Data Loggers

Data Loggers are microprocessor based monitoring system which can look after the signal incidences in stations all through 24 hrs by logging the operations failures/accidents in the station yard Data loggers are installed at stations provided with Panel Interlocking / Electronics Interlocking/ Cabins. Data loggers help in diagnosis of signal defects. Networking of Data loggers with Zonal HQ has been done for centralised monitoring.

Intergraded Power Supply (IPS)

SMPS based Integrated Power Supply Systems are being provided for Signalling Installations. By providing these systems, various voltages required for signalling sub-systems can be derived form IPS alleviating the need for battery banks. It prevents blanking of signals due to power failure and enhances safety in train operation.

Universal Failsafe Block Interface (UFSBI)

In order to improve reliability of signaling system, transfer of the block circuit from 4 Qd. Cable to OFC is felt necessary. For this system, Universal Failsafe Block Interface (UFSBI) equipments are provided at 26 block sections of Ranchi Division.

Telecommunication

Providing basic telecommunications facilities for the Railways vast transport system is the responsibility of the Signal & Telecom Department. The telecommunication facilities provided on the Railways are broadly categorized in to three areas of applications.

-Train Operation

-Data Communication for Railway Information Technology Applications

-Administrative Communications.

Telecommunication for Train Operation

Provides omnibus communication circuits on ofc and Quad cable and overhead telecom wires for operation of trains and other supporting activities of train control. The omnibus circuit provides telephone communication between the station-masters and the control centre at the divisional headquarters. Other omnibus circuits are also provided for other supporting train operations, including remote operation of 25 KV AC power supply systems required for electric traction. Emergency communication facility is provided along with the track throughout the route for the rivers and guards of the running train to communicate to the control centre at the respective divisional headquarters during emergencies.

1) Optical Fibre Communication

Optical Fibre Communication system is the backbone of Railways Telecommunication Network. The short-haul STM1 equipment of 155 Mbps capacity is provided at every station along the fibre network. The short-haul STM1 network is protected by long-haul STM4 / STM16 self healing ring network provided by RailTel. The fibre network carriers Voice, Data & Multimedia services for various applications.

2) Data Communication

Data communication circuits for computerized Passengers Reservation System (PRS), Unreserved Ticketing System (UTS), Crew Management System(CMS), Freight Operation Information System(FOIS), Coach Operation Information System(COIS), Management Information System (MIS) etc. and in-house E-mail facilities are provided by Signal & Telecom branch.

3) Telephone Exchanges

Telephone Exchanges are provided at important locations in divvision for Railways internal Communication requirements.

i) Closed User Group

Mobile Communications are Provided to officers and supervisor staff in Ranchi division . CUG Mobile phones are also provided to loco pilot, assistant loco pilot and guards of all Divisions.

Passenger Amenities

The Signal & Telecom Department provides various passengers amenities for the benefit of travelling public.

Public Address System is provided at various stations to announce the arrival & departure of trains and other information required by travelling passengers. This facility is available at 43 stations in Ranchi division.

Train Indication Boards are provided for indicating the train timing and platform numbers at 3 stations in Ranchi division.

Coach Indication Boards are provided for indicating the coach position of the train on the platform at 3 stations in Ranchi division..

Railnet

RAILNET infrastructure provides Corporate Wide Information System for Indian Railways. The network connects SER to all the 4 divisions. headquarters GRC is connected to all the divisions(Ranchi ,ADA,CKP,KGP)

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