

# CHAPTER XXV

## FAULT CONTROL PROCEDURES

### 25.1 INTRODUCTION:

This chapter discusses the Fault Control Procedures for Railway's Telecommunication Network both at Zonal Level as well as Divisional Level.

In a typical Railway Telecom Network scenario, following types of Telecom Network co-exist :

- **Transmission**

- Microwave/UHF Network
- Optical Fibre Cable Network
- RE Telecom Cable Control Network
- Railway's Overhead Wire Control Network
- DOT owned Overhead Wire Control Network

- **Switching**

- Electronic Telephone Exchanges
- Electro-Mechanical Telephone Exchanges

- **Others**

- Single Channel Duplex UHF/VHF Radio System
- Multiple Access Radio Relay (MARR) Systems
- Pair Gain System
- VHF/UHF Simplex Trans-receivers
- Talk Back Systems for Major Yards

It is indeed very necessary to establish well defined Fault Control Procedures for satisfactory maintenance of such diverse Railway Telecommunication Networks so as to meet the demanding requirements of Indian Railways in the 21<sup>st</sup> Century.

## FAULT CONTROL PROCEDURES

### 25.2 TYPICAL TELECOM FAULT CONTROL SET-UP ON A RAILWAY

Typical telecom fault control set-up on a Railway shall consist of the following:

1. **ZONAL TELECOM FAULT CONTROL SET-UP**
2. **DIVISIONAL TELECOM FAULT CONTROL SET-UP**

The Zonal Telecom Fault Control Set-up shall be one for the entire Zonal Railway.

The Divisional Telecom Fault Control Set-up shall be established in each Division of the Zonal Railway.

### **25.3 ZONAL TELECOM FAULT CONTROL SET-UP**

25.3.1 It shall be manned by Section Engineer (Telecom) in a general shift. Three Section Engineers (Telecom) shall be earmarked and should man the Zonal Fault Control set-up round-the-clock in case of emergencies. Following Telecom Network shall be monitored by the Zonal Telecom Fault Control Room.

- **Microwave/UHF Network on the entire Zonal Railway**

25.3.2 The Zonal Telecom Fault Control Room shall also function as an Emergency Telecom Control Room in case of Emergencies requiring immediate telecom facilities/restoration. The emergencies may consist of the following:

- Major Rail Accidents
- Cyclones
- Breaches

25.3.3 When the Zonal Telecom Fault Control Room functions as the Emergency Telecom Control Room, the Divisional Telecom Fault Control Rooms of the affected Division(s) shall report their positions to the Zonal Telecom Fault Control Room which in turn shall advise the Telecom Officials at HQs of the latest developments.

25.3.4 The Zonal Telecom Fault Control Room shall function under the direct control of Dy. Chief Signal & Telecom Engineer (Microwave) or any other officer designated by the Chief Communication Engineer of the Railway.

### **25.4 DIVISIONAL TELECOM FAULT CONTROL SET-UP**

25.4.1 The Divisional Telecom Fault Control Set-up shall have two components:

a) For monitoring all telecom networks other than Microwave/UHF called: Divisional Telecom Fault Control Room.

b) For monitoring Microwave/UHF networks called: Divisional Microwave Fault Control Room.

Each of these Control Rooms shall be headed by a Senior Section Engineer (Telecom) in a general shift. Three Section Engineers (Telecom)/ Jr. Engineer (Telecom) shall man the Fault Control Room round-the-clock.

25.4.2 Following Telecom Networks shall be monitored by the Divisional Telecom Fault Control Room.

- Optical Fibre Cable Network
- RE Telecom Cable Control Network
- Railway's Overhead Wire Control Network

- DOT owned Overhead Wire Control Network
- Electronic Telephone Exchanges
- Electro-Mechanical Telephone Exchanges
- Single Channel Duplex UHF/VHF Radio Systems
- Multiple Access Radio Relay (MARR) Systems
- Pair Gain Systems
- VHF/UHF Simplex Trans-receivers
- Talk Back Systems for Major Yards
- Any other new Telecom System

25.4.3 Following Telecom Networks shall be monitored by the Divisional Microwave Fault Control Room.

- Microwave/UHF Network on the entire Division

## **25.5 OFFICE AIDS/TELECOM FACILITIES TO BE PROVIDED AT THE ZONAL/DIVISIONAL TELECOM FAULT CONTROL ROOMS**

Following Office Aids/Telecom Facilities shall be provided for satisfactory functioning of the Telecom Fault Control Rooms

- Fax Machine on an exclusive Railway Telephone Line with STD Facility
- Fax Machine on an exclusive MTNL Telephone Line with STD Facility
- Computer System with Printer & Modem on an exclusive Railway Line with STD facility
- E-Mail facility where-ever available
- Hotline Communication between various Telecom Fault Control Rooms

## **25.6 PROCEDURE FOR FAULT REPORTING TO ZONAL TELECOM FAULT CONTROL ROOM & ITS FUNCTIONS**

25.6.1 Each of the Divisional Microwave Fault Control Rooms shall report their daily positions to the Zonal Telecom Fault Control Room by the following communication means:

- By Railway FAX
- By E-Mail where-ever available

25.6.2 Any unusual occurrences, any Microwave/UHF Radio link breakdowns or Channel Interruptions of vital circuits e.g. PRS data circuits, Inter-Railway or Inter Division Administrative Trunk Circuits, Control Hotlines from Zonal Hqs to Divisions, shall invariably be reported to Zonal Telecom Fault Control Room immediately on their occurrence on Telephone followed by FAX/E-Mail.

25.6.3 Monthly, Quarterly & Annual Communication System Performance Reports of the Division shall be transmitted through Modems on Railway lines to the Zonal Telecom Fault Control Room, as per specified proforma.

25.6.4 A uniform Application Program shall be loaded on the Computers in every Telecom Fault Control Room at Zonal Levels. This shall ensure transparency of Data Transmission between Fault Control Rooms of the Divisions.

25.6.5 The Zonal Fault Control Room shall compile Monthly, Quarterly & Annual Communication System Performance Reports of the Railway as per specified proforma, for transmission to Railway Board.

25.6.6 When during emergencies, the Zonal Telecom Fault Control Room functions as an Emergency Telecom Control Room, following additional functions shall get automatically assigned :

- Maintaining very close co-ordination with the Divisional Telecom Fault Control Room.
- Liaisoning with BSNL/MTNL Officials at Hqs, if required, for providing additional telecom facilities e.g. Extra BSNL/MTNL Nos., STD Facility on way-side Telephones with ASMs. For this, Telephone Nos. with Designations of concerned BSNL/MTNL Officials shall be kept up-to-date in the Control Room.
- Mobilising additional telecom resources as per site requirements.

25.6.7 A Disaster Management Plan detailing out the action to be taken in Emergencies shall be prominently displayed in the Control Room.

25.6.7 Fault Control should ensure that minimum telecom needs with divisions and zones are provided at accident side in least time.

## **25.7 PROCEDURE FOR FAULT REPORTING TO DIVISIONAL TELECOM FAULT CONTROL ROOM & ITS FUNCTIONS**

25.7.1 Various Telecom Installations on the Division shall report their periodic , daily or unusual occurrence report to the Divisional Control Room on Telephone.

25.7.2 The Divisional Telecom Fault Control Room shall compile the Monthly, Quarterly & Annual Communication System Performance Reports of the Division as per specified proforma for transmission to the Zonal Control Room.

25.7.3 Liaisoning with BSNL/MTNL Officials at Divisional level, if required, for providing additional telecom facilities e.g. Extra BSNL/MTNL Nos., STD Facility on wayside Telephones with ASMs. For this Telephone Nos. with Designations of concerned BSNL /MTNL Officials, shall be kept upto date in the Control Room.

25.7.4 Mobilising additional telecom resources as per site requirements in case of emergencies.

25.7.5 A uniform Application Program shall be loaded on the Computers in every Telecom Fault Control Room at Divisional Level. This shall ensure transparency of Data Transmission between Fault Control Rooms.

25.7.6 A disaster Management Plan detailing out the action to be taken in Emergencies shall be prominently displayed in the Control Room.

25.7.7 Fault Control should ensure that minimum telecom needs with divisions and zones are provided at accident side in least time.

**25.8 PROCEDURE FOR FAULT REPORTING TO DIVISIONAL MICROWAVE FAULT CONTROL ROOM & ITS FUNCTIONS**

25.8.1 The Microwave/UHF Stations on the Division shall report their periodic daily or unusual occurrence report to the Divisional Microwave Fault Control Room on Telephone.

25.8.2 The Divisional Microwave Fault Control Room shall compile the Monthly, Quarterly & Annual Communication System Performance Reports of the Division as per specified proforma for transmission to the Zonal Telecom Control Room.

25.8.3 Liaisoning with BSNL Microwave Officials at Divisional level, if required, for providing additional telecom Channels/restoration of Channels in case of failures. For this, Telephone Nos. with Designations of concerned BSNL Officials, shall be kept upto date in the Control Room.

25.8.4 Mobilising required Spare Modules/Fixtures as per site requirements in case of emergencies.

25.8.5 A uniform Application Program shall be loaded on the Computers in every Microwave Fault Control Room at Divisional Level. This shall ensure transparency of Data Transmission between Fault Control Rooms.

25.8.6 A Disaster Management Plan detailing out the action to be taken in Emergencies shall be prominently displayed in the Control Room.

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