

## **rites Limited**

### **Gurugram, Haryana**

### **Know the Safe from Experts: Delve Deeper into Safe Practices!**

– Tarini Baswal\*, U.C. Saklani\*\*,  
Subhadeep Kuila\*\*\*

#### **Who are we?**

RITES Limited, a Miniratna (Category-I) and Schedule 'A' Central Public Sector Enterprise under the Ministry of Railways, incorporated on April 26, 1974, is a multidisciplinary engineering and consultancy organization, providing a comprehensive range of services from concept to commissioning in all facets of transport infrastructure and related technologies.

#### **What do we do?**

RITES is a leading player in the transport consultancy and engineering sector in India and uniquely placed in terms of diversification of services and geographical reach in various sectors such as railways, highways, urban engineering (metros) & sustainability, airports, ports, ropeways, institutional buildings, inland waterways, and renewable energy. The company is the only export arm of Indian Railways for providing rolling stock, other than Thailand, Malaysia, and Indonesia.

RITES' success story spans over 48 years covering more than 55 countries across Asia, Africa, Latin America, South America, and Middle East regions.

RITES became a listed company in July 2018, and it has made it to the Top-500 listed Indian companies based on its market capitalization.

This document forms a case study on what safety measures RITES team ensures while executing works, be it in the Design phase, or the Project Management Consultancy (PMC) phase.

A few examples of verticals have been shown in this document with the exact safety measures that are ensured while executing the works.

#### **A. Signalling & Telecommunications -**

While executing Project Management Consultancy works involving S&T works, RITES follows Handbook on Safety in Signalling, Ver 2.0, published by CAMTECH, issued by Ministry of Railways.

Some of the Safety Standards & Precautions in Mechanical & Electrical Signalling Installations followed and ensured are as:

##### **1. *Electric Lifting Barriers***

- It is ensured and cross-checked that the time of operation of the electric lifting barrier is less than the Stipulated Time.

---

\*Executive Director/ Rail Infra

\*\*SDGM/Civil

\*\*\*Engineer/Traffic

- It is also ensured that the measured value of excitation current never exceeds the Rated Values.
  - It is ensured that the lifting barrier is satisfactorily working by executing few hand-crank drills and ensuring the electrical excitation does same as the hand crank one.
2. *Electric Point Machines*
- RITES team ensures that the switches are properly placed against the stock rail by moving the switches slowly.
3. *Track Circuits*
- Crosschecking that the limiting resistance is as high as possible.
  - Ensuring the ballast resistance always remains high and does not fall below prescribed minimum values.
4. *Fire Safety in Signalling*
- Ensuring strategic placement of firefighting equipment at locations from where the visibility and accessibility is most.



RITES always checks & compares the extent of lifting of an electrical lifting barrier through electric excitation vis-à-vis the lifting when done through hand-cranks.

## **B. Tunnelling Works -**

While designing a tunnel, RITES follows a multi-faceted approach involving multi-parameters and state-of-art collaboration between engineers, architects & SHE experts.

Designing a tunnel involves considering a variety of safety measures to ensure the well-being of both workers during construction and users once the tunnel is operational. Here are some safety design measures to consider:

1. *Geotechnical Investigations*

- Proper study of rock and soil conditions of proposed site
- Determining potential risks like landslides, collapses & ground settlements etc.

2. *Ventilation*

- Designer ensures an effective ventilation system to maintain air quality within the tunnel.
- Team leader ensures the designed ventilation system is capable of removing pollutants and providing fresh air circulation.

3. *Escape Routes*

- Engineer creates designated refuge areas or alcoves along the tunnel where people can safely wait during emergencies.
- Engineer ensures that these areas are equipped with emergency communication systems, like SAT phones etc.

4. *Human Factors*

- Human factors are considered in the design, including factors like ergonomics, visibility, and cognitive load, to minimize driver fatigue and distractions.



RITES always ensures that while designing a tunnel that ventilation systems are placed at regular intervals to ensure air quality inside the tunnel.

**C. Metro Works-**

RITES SHE team ensures standard norms related to PMC works of metros are followed during the construction phase, some of which have been categorized as under-



1. ***Personnel Safety***

- Defining of minimum PPE & gear requirements
- Use of Hardhats, eye protection kits, high-visibility vests, Steel-toed boots, chin straps, full body harness etc.

2. ***Safe Planning Practices***

- Defining Barricade areas and preparing traffic diversion plans
- Use of well-lit signages, plastic barriers, blinkers etc.

3. ***Site Electricity***

- Ensuring of Double Body Earthing, Body earth connection and Resistance checking
- Tapped Joints are replaced by plugs & sockets
- Ensuring placement of lightning arrestors on Silos, Gantry cranes etc.

4. ***Hot Works (Gas Cutting & Welding)***

- Proper gears -PPEs while operating
- Gas Cylinders must have valves, keys, caps & double pressure gauges
- Storage of cylinders – upright, restrained, cool locations
- Park off and cool off period is ensured after each work

5. ***Environmental Safety***

- Regular Air Quality Monitoring & deployment of dust suppression measures
- Regular and iterative vibration & Illumination monitoring by SHE team
- Installation of Air Compressors & Noise Control
- Ensuring of waste segregation & safe disposal



Metro SHE team is responsible for creating a diversion & barricading plan for the existing traffic flows to ensure no civilian gets in a proximity of the project area.

## D. Electrical Works -

Railway Electrification involves several safety measures to ensure the safety of passengers, railway staff, and the general public. These measures are put in place to prevent accidents, minimize risks, and maintain the reliable operation of the electrified railway system.

Here are some of the key safety measures that are typically ensured during the electrification of a new railway line:

### 1. *Clearances & Signages*

- Adequate clearances are ensured between the overhead wires and nearby structures, bridges, tunnels, and vegetation to prevent accidental contact.
- Ensuring placement of clear and visible signage indicating the presence of electrified along the track and at appropriate locations to warn personnel and the public.

### 2. *Insulations*

- RE team ensures installation of Insulators to prevent current leakage
- Ensuring that the overhead wires remain electrically isolated from supporting structures.

### 3. *Fencing & Access Controls*

- PMC team ensures fencing and barriers are erected along the railway tracks and electrified equipment to prevent unauthorized access by pedestrians, vehicles, and animals.

### 4. *Grounding & Bonding*

- Proper grounding and bonding techniques are employed to ensure that any stray electrical currents are safely redirected to the ground.
- Ensuring failsafe lightning protection, static discharge, galvanic corrosion, electromagnetic interference, equipotential bonding etc.



RITES RE team does regular inspections using OHE Inspection Car while executing the PMC works for Railway Electrification for new lines.

## E. Traffic Surveys

RITES conducts traffic surveys for traffic and feasibility studies related to either Railway Projects or Urban Engineering/City Planning. Whilst, the feasibility reports maintain standard quality checks in terms of methodologies of executing the studies, the field survey team also ensures that field data is received in the safest manner.

Some of the standard safety measures undertaken by traffic survey team are:

### 1. *Proper Clothing & Gears*

- RITES survey team uses high-visibility & retro-reflective vests to ensure clear visibility to road vehicles.

### 2. *Traffic Control Devices*

- Site team uses traffic cones, barriers, signs, and flags to guide both motorists and pedestrians around the survey area.
- TCDs create a safe workspace and alerts drivers to changes in road conditions.

### 3. *Traffic Control Personnel*

RITES team collaborates with local traffic police to ensure traffic flows in a non-hampering manner.

### 4. *Emergency Procedures*

- RITES team clearly sets up protocols for dealing with emergencies, accidents or unsafe situations.
- All team members are properly trained to respond adequately to emergency situations.

### 5. *Use of non-human resources*

- Site team ensures that Traffic Volume Count are collected using videography cameras.
- Use of videography cameras ensures least involvement of human resources and reduces the risk factors related as much as possible.



Survey team wears retroreflective gears and ensures traffic control devices like barricades and speed barriers are installed at survey locations.