

INFRA, TELECOMS SAFETY MANAGEMENT

VOLUME 1

WORK PROCEDURE

REN 1.13 - WP

Optic Fibre Cable Break

SCOPE	Performing work next to the rail on fibre optic cable suspended on DC or AC traction masts.
SITUATION	Optic fibre cables are suspended on traction masts. They are installed along the rail formation in steep cuttings and tunnels. The cable is vulnerable to: a) Theft; b) Vandalism; c) Threes dislodging; d) Fire; e) Derailment.
TASK PURPOSE	To perform repairs to optic fibre cable in all weather conditions and any given time of the day or night.
WORK PERFORMED BY	Engineering and Technical personnel and those who assist them.
TRAINING REQUIREMENTS	<p>All persons performing any work must be trained in:</p> <ul style="list-style-type: none"> • Optic fibre course. • "C" certificate. • Safety Instructions: High-voltage Electrical Equipment Part 1 and 2. • Transnet specification E.7/1 and E.4E. • Flagman duties. • Use of Personal Protective Equipment. • First Aid. • Fire Fighting procedures.
CRITICAL ITEMS	<p>Early warning device and detonators. Communication medium. Emergency telephone numbers. Dead order with electrical control. Tools.</p>
PERSONAL PROTECTIVE EQUIPMENT TO BE USED	<p>Safety Boots/Shoes Protective Gloves Safety belts Illumination braces Hard hats Ear muffs (Flagman using detonators.)</p>
STEPS IN THE PROCESS	<p>Evaluate extent of damage and risk factors Transporting all staff, tools and material to site Derive to an action plan Advise Comm control/DTC and CTC of where about Place flagman and security staff Start generators and install lights Pitch splicing and logistic tents</p>

Place ladders and install 2x “dead-end” brackets
 Feeding optic fibre cable from reel in trailer or drum
 Suspend and regulate fibre cable
 Dress cable into dome joints
 Splice fibres and dress fibres into dressing tray
 Mount dome joint to stack box and then stack box to mast pole
 Perform quality test with O.T.D.R.
 Clean site of all rubble
 Advise Comm control of completion
 Depart from site.

DESCRIPTION OF STEPS

EVALUATE EXTEND OF AND RISK FACTORS

Establish where the cable is damaged and to what extend.
 In all instances where the safety of workmen is jeopardised, electrical and/or track occupations must be requested.
 Treat all Traction wire, cable and brackets as being alive.

REMOTE AREAS

Test Room to be **aware** of your presence in the section.
 Check **security** of area.

Risk Assessment of the area:

- Presence of moving **Train**
- Presence of moving **Vehicles**
- Condition of the Ground **surface**. Level – Ditches
- Presence of **Insects** – scorpions, etc.
- Presence of **Reptiles** – snakes
- Fire **hazards** – suitable and sufficient **Fire Fighting** equipment.

TRANSPORTING STAFF, TOOLS AND MATERIAL

Staff, tools and materials to be transported in vehicles **suitable to the task**;
 Sufficient amount of workers to be present to do the task.
 Work could continue 6 – 10 hours pending conditions and dry rations and hot/cold drinks are recommended.

DERIVE TO AN ACTION PLAN

Everybody on site must be informed of the action plan and tasks should be given.
 Staff to be informed to wear their personal protective equipment.

ADVISE COMM CONTROL/ DTC

Establish communication with CTC and Comm Control/DTC and advise of where about.
 Request CTC for speed restriction of trains and traffic diversion to furthest rail.

PLACE FLAGMAN AND SECURITY

Flagman must be placed with detonators and early warning device.

START GENERATORS

Install lights. Lights must be of a weatherproof type.
 No green, red or amber lights must be used next to rail because this could confuse train drivers.

PITCH SPLICING/LOGISTIC TENT

Splicing equipment must be used inside a tent to illuminate dust or damp conditions.

PLACE LADDERS	NO metal ladders will be allowed. Only wooden or fibreglass ladders.
INSTALL “DEAD END” BRACKETS	A termination bracket and fitting (Dead end) must be installed at each end of the cable.
FEEDING OPTIC FIBRE CABLE FROM THE DRUM	Place the drum at least one span length away from the mast. Under no circumstance should the cable be bent excessively. The drum should be placed on cable jacks with axle, if trailer is not fitted with a reel. The rate of the hauling should be controlled from this point.
HAULING OF CABLE ON DC TRACTION MASTS	It is recommended that a 7mm nylon ski-rope of +- 2000m shall be obtained The rope must be approved for use on 25kV and 50kV AC electrified sections. Hauling shall be done through the special manufactured pulleys. These pulleys must be fitted on every suspension bracket for a distance equivalent to the length of the cable. The rope must be fed through the pulleys before hauling commences. A spring-loaded shackle and swivel must be fitted between the hauling rope and cable. Secure the hauling rope to the cable end by means of a hose grip. The cable must be fed off the cable drum according to the speed with which the cable is hauled. The hauling team must haul the cable evenly and slowly to prevent it from jerking. Tension must be maintained to avoid contact with trains. Radio communication between persons at the drum, alongside the cable-end and the hauling team, is essential. When cable starts twisting, hauling must stop immediately. The cause of the problem must be pinpointed and rectified.
DRESS CABLE INTO DOME JOINTS	The correct method for connecting the cable to a splice enclosure must be used.
SPLICE FIBRES INTO DRESSING TRAY	Optical fibres are extremely thin and can easily penetrate skin or eyes. Any off cuts or bare pieces of fibre must be properly disposed of. The splice protectors must be tied solidly, but not too tight with cable ties.
MOUNT DOME IN SLACK BOX	The dome should be mounted in the slack box.
FIX STACK BOX TO MASTPOLE	The fix slack box must be attached to the bracket.
PERFORM QUALITY TEST WITH O.T.D.R.	Care must be taken when testing as the laser in test equipment produces an invisible light, which can cause permanent eye damage. All fibres should be treated as “live”.
CLEAN SITE OF ALL RUBBLE	All the tools must be collected and the site must be cleaned.

OF COMPLETION

DEPART FROM SITE

Collect all tools.

ADMINISTRATION

Record procedure on site maintenance sheet.

Complete maintenance report.

Graphic print outs or software files must be submitted to the Project Manager.

GENERAL COMMENT

Suitably qualified persons to work as a team.

Identified site supervisor or take **responsibility** of work and work team.

All persons must **adhere** to this Safe Working Procedure.

Any persons not supplied with PPE **may not perform** the work.

Ensure work area is **demarcated**.

Ensure **working signs** "Men at Work" are always in place where required.

Maintain **vigilance** and contact for trains and vehicles.

Do not pass tools by **throwing** it.