Ref	NR/WI/ELP/27140WEX
Issue	**5**
Date	06/07/2022

Work Instruction

Strapping Next to An Open Line Working Instruction

Endorsement & Authorisation

Endorsed by:

Sign…… **……**
Andy Malcolm, Outer DU IMDM

Sign…… **……**
Louise Carvey, Inner DU IMDM

Authorised by:

Sign……  **……**
Tracey Capstick, Head of Route Quality, Health and Safety, Wessex Route

Issue record

Issue	Date	Comments
2	April 2006	Re-issued as a SAF Business Process Document (formerly RT/E/P/27140)
3	08/10/2020	Procedure amended, detailing how straps are applied and removed from the 4-foot
4	26/03/2021	Re-issued with updated Section 6 Procedure for the application of a short-circuiting strap

Implementation
08/10/2020

Compliance
This Network Rail work instruction is mandatory and shall be complied with by Network Rail and its contractors if applicable from 08/10/2020.
Work on or near the conductor rail is subject to Statutory Acts and Regulations, in particular the Health and Safety at Work Act 1974, the Electricity at Work Regulations 1989, Network Rail Rules and Instructions including the Electrified Lines Working Instructions for the appropriate D.C. system.

Supply
Copies of documents are available electronically, within Network Rail's organisation. Hard copies of this document will be available to Network Rail employees on request.

Location affected

Wessex Route, Southern Region

Personal safety
It is dangerous to touch or allow objects to contact the live conductor rail, associated equipment, collector shoes or underframe mounted electrical equipment on trains or locomotives. These components shall always be treated as live until electrical protection arrangements have been confirmed.

Insulating equipment shall be examined before use to ensure it is clean, dry and of sound construction. Defective insulating equipment shall be immediately withdrawn from use and a replacement obtained.

Wet conditions increase the risk of electric shock owing to tracking of current via wet surfaces and in such conditions special care must be taken to ensure that protective equipment is dried before use and that a safe system of work is achievable. Where this is not considered possible the circumstances must be reported to the person in charge.

Care shall be taken to avoid tripping, falling or slipping when working or walking in the vicinity of the live conductor rail. Crossing the conductor rail shall be avoided wherever practicable but, when necessary, the method described in 6.2 shall be used.

Content

1 Purpose

This Work Instruction specifies the actions necessary for the application of and the removal of short-circuiting straps as required for the protection of conductor rail isolations as required by the D.C. Electrified Lines Instructions (NR/L3/ELP/3091).

2 Scope

This Work Instruction applies to all D.C. Electrified Lines using conductor rails.

3 Reference Documentation

NR/L3/ELP/3091 D.C. Electrified Lines Instructions

4 Competency

Only staff who are certificated as competent as Level B (Competent/Authorised) Persons may carry out this activity.

5 Location of Short Circuit Straps

5.1 Isolation Form B

The locations of where straps are to be applied will be shown on the appropriate Isolation Form B and shall be defined by specifying the line concerned, and miles and chains.

5.2 Normal Location

The straps will be normally located at the limits of each work site within the limits of the isolation.

5.3 Additional Straps

If a work site is long enough to encompass more than two electrical sections, additional straps shall be required. If conductor rails or running rails are to be disconnected, then additional straps may also be required.

6 Procedures for the application of a short-circuiting strap

This procedure must be carried out from the 4ft of the blocked road. At no point during the application of the short-circuiting strap must any person or materials stray beyond the conductor rail towards the open line or encroach any train movements on the open line. Should a train approach on the open line whilst a person is in the process of applying the clamp to the inside of the conductor rail, the individual applying the clamp **must** stop what they are doing, stand up and remain in the position of safety in the blocked line and acknowledge the train. After the passage of the train the individual can continue applying the clamp to the inside of the conductor rail. Should at any point in the application of the short-circuiting strap any item or materials accidentally fall foul of any open line, the signaller must be notified immediately and a line blockage or an emergency isolation if required, must be taken on the open line in order to retrieve the item or materials.

6.1 Testing

Before a short-circuiting strap is applied, other than where a short-circuiting bar is being used in emergency in accordance with Rule Book module DC, the conductor shall be verified as being de-energised.

Where a manually applied short circuiting strap is to be used, the test shall be undertaken using an approved Live Line Tester, which shall be proved to be operating correctly both before and after the conductor rail is tested.

6.2 Connecting straps to the running rails

6.2.1 Before use the short-circuiting straps shall be visually examined for damage or wear and that all bolted connections are secure (see clause 7).

6.2.2 Clean the underside of the running rail furthest from the conductor rail.

6.2.3 Secure the single leg of the short-circuiting strap to this rail.

6.2.4 Clean the underside of the running rail closest to the conductor rail.

6.2.5 Secure the double leg clamp of the short-circuiting strap to the running rail closest to the conductor rail ensuring that the third rail clamp is well clear of the conductor rail.

6.2.6 Undertake the Test before Strapping check, using a Live Line Tester to prove that the conductor rail is de-energised (dead). As per the A2. Application Sequence in NR/L3/ELP/27140 Issue 4.

6.3 Short circuiting bar

6.3.1 Before use the short-circuiting bar shall be visually examined for damage (see clause 7).

6.3.2 A short circuiting bar shall be applied as follows:

6.3.3 The handle should be wiped to ensure that it is clean and dry.

6.3.4 Identify the position where the bar is to be applied which must be close to where the strap will be fitted.

6.3.5 Remove the guard boarding and conductor rail shroud where necessary. Conductor rail shroud shall be removed using rubber gloves.

6.3.6 If necessary clear ballast with an insulated tool.

6.3.7 Stand firmly on the ballast in the four-foot way.

6.3.8 Grasp the handle of the bar at the farthest end from the metal portion.

6.3.9 Slide the metal portion of the bar over the running rail and under the conductor rail until the heel of the bar rests against the edge of the running rail, keeping the metal portion as far away from the conductor rail as possible.

6.3.10 Turn and face away from the conductor rail to which the short-circuiting bar is to be applied.

6.3.11 Depress the handle of the bar smartly so that the metal portion makes a good hard contact between the conductor rail and running rail. Leave the bar in position.

6.4 Connecting the strap

6.4.1 Rubber gloves must be worn throughout this process. Clean the underside of the 4ft side of the conductor rail with a wire brush where the short circuiting strap is to be fitted.

6.4.2 Using the strap already connected to the running rails, push the third strap under the running rail closest to the conductor rail and once complete pull the excess strap back through so as to avoid any unecessary bending. Attach the third clamp to the inside of the conductor rail ensuring all clamps are properly tigthened.

6.5 Removing the short circuiting bar

6.5.1 The short circuiting bar can now be removed if ballast trains, trolleys etc are to pass.

6.5.2 Stand firmly on the ballast in the four foot way.

6.5.3 Grasp the handle of the bar at the farthest end from the metal portion.

6.5.4 Lift the handle of the bar smartly so that the metal portion clears the conductor rail and is against the running rail, then lift the bar clear of the rails.

7 Defective Equipment

7.1 Short circuiting straps

Any short-circuiting straps found on examination to have any of the following defects shall not be used, should be returned to depot and arrangements made for repair:

Broken wire strands

Loose cable lugs

Jammed clamping screws

Damaged insulation

7.2 Short circuiting bar

Any short-circuiting bar found on examination to have any of the following defects shall not be used, should be returned to depot and arrangements made for repair:

Damage or split handle

Loose or damaged anvil

8 Short Circuit Current

If either the short-circuiting bar or strap has carried short circuit current due to conductor rail being re-energised, a written report must be submitted by the Level A (Authorised/Nominated) Person and the equipment returned to the depot for special examination.

9 Control of risk

9.1 Additional check to include:

If a vehicle/s or engineering train/s is/are allowed to pass over any short-circuiting strap, then that strap must be inspected by a competent person for security.

In the event a strap is displaced or made loose, a phone call must be made straight away to the Engineering Supervisor (ES) who must then inform all COSSs within the site to stop work and retest the conductor rail in the area they are working.

All staff working in that area must be instructed to move to a place of safety whilst the strap is re-secured.

It will be the ES's responsibility on the shift to arrange a competent Strap Person to re-attach the strap.