



**AUSTRALIAN RAIL TRACK CORPORATION LTD**

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**Rerailing – Precautions to be Taken**

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## About This Standard

This Standard defines the procedures and precautions to be followed when carrying out Rerailing activities

## Document History

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### List of Amendments –

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# 1 GENERAL

Precautions to be taken when rerailing occurs in a track circuited or electrified area are as follows.

## 1.1 Authorisation

Planned rerailing work requiring a track possession is carried out in accordance with Network Rules NWT 300 - 314.

When a signalling maintainer is not in attendance and temporary rail bonds are authorised by a Signal Engineer for use by the civil engineering staff in accordance with section 1.5 of this procedures *Guidelines for the use of temporary rail bonds*, the civil engineering staff and worksite supervisor must be properly instructed and qualified in the use of the temporary bonds.

Where the signalling maintainer is in attendance they shall disconnect the track circuit and the affected signal(s) and if required provide an alternative path for the traction return current.

## 1.2 Precautions

Prior to the commencement of the rerailing and after the relevant signals have been disconnected, Infrastructure Booking Authority (IBF) NRF 003 form shall be completed showing the full particulars of the equipment affected and signed by the Civil and Signalling representatives. Where the rerailing affects the operation of signals and points controlled from an interlocking an entry shall also be made in the Train Register Book and the signed NRF 003 form, attached to the current page of that book.

Where the Electrical Discipline is involved, the representative of that Discipline shall also sign the forms in which case an additional copy for them will be required.

The signalling maintainer should check that handsignallers, where necessary, are positioned at their posts by the Worksite Supervisor before the signals protecting the section where the rerailing is to take place are disconnected and maintained at stop. Where rerailing occurs on the overlap track circuits the signal in the rear shall also be disconnected and maintained at stop. Distant signals or equivalent signals in rear are to be securely maintained at their correct restrictive indication by preventing the higher indication controls from operating. Where train stops are provided, the train stop at the signal immediately protecting the section where the rerailing is to proceed shall be maintained in the stop position. The train stop at the signal in the rear, if affected, shall be suppressed and the track stick contact in the train stop temporarily bridged to facilitate traffic movements. The requirements of SMP 01 for temporary bridging shall apply. Regulation jumper wires shall be used and care shall be taken to ensure that this temporary bridging is removed on completion of the work (the large, easily noticeable bridging jumper wire shall be used to act as a memory aid). The suppression of the trainstop and the use of bridging on train stop normal contacts shall be clearly noted on the NRF 003 form.

In CTC areas provided that the section is clear it is sufficient to disconnect the Starting Signal at one end of the section as well as disconnecting the Section Control and the track relay of the particular track affected.

When it is necessary for rerailing to be carried out on a section of track controlling the operation of an automatic level crossing the crossing must be protected as shown in NPR 715.

Special regulations exist to permit the boom barriers to be secured in the raised position and to suppress the warning lights and bells.

When rerailing is being carried out in an area where the operation of level crossing protection will be affected, and where individual emergency light and bell switches are not provided, the signalling maintainer must be in attendance to disconnect and reconnect the lights and bells (as requested by the handsignaller for the passage of each train.)

When rerailing is to be carried out in an area where the operation of level crossing protection will be affected and individual lights and bell switches are provided, the Worksite Supervisor will supply handsignallers to switch on and off the lights and bells at the emergency switches as required, and flag road and train traffic accordingly.

Booms are to be tied up in the raised position by the handsignallers acting under the instructions of the Signaller.

The signalling maintainer shall disconnect the level crossing protection, removing the crossing control relay (XR) fuse, the affected up or down road control relay fuse and also removing the boom motor fuse to protect the motor should the emergency or control boom switch be inadvertently turned on while the booms are tied up. The level crossing protection should not be reconnected until the track circuit is reconnected and checked to be shunting trains reliably.

In the case of rerailing affecting level crossing protection on single lines, the signalling maintainer shall also disconnect both the up and down direction sticks in addition to carrying out the other precautions before the work commences.

Where the level crossing is situated in an interlocking and protected by home signals including the signal approaching the level crossing on the track not affected by the rerailing, the fixed signals protecting the interlocked level crossing are to be disconnected and maintained at stop and the distant signals or equivalent signals in rear are to be securely maintained at their correct restrictive indications by preventing the higher indication controls from operating.

Where the level crossing is situated in Double line Automatic areas, the signals approaching the level crossing on the track not affected by the rerailing may be left working, in addition to carrying out the other precautions before the work commences.

On completion of the work the level crossing protection must be reconnected and the operation of the approach track circuits and the level crossing must be thoroughly tested before the hand signallers at the crossing are withdrawn and before the level crossing protection is booked back into use.

The Civil staff must protect their operations in accordance with NWT 300 as applicable.

In a 1,500v dc electrification area, before any interference with the rails forming part of the traction return is permitted, adequate provision shall be made for a safe return path for the traction current to the sub-station or section hut.

At the same time the signalling equipment shall be safeguarded against damage due to a possible rise in traction return voltage.

Refer to procedure SMP 27 covering “Traction Return”, which details the precautions and safeguards which shall be adhered to when rerailing or disconnection of bonds is to be carried out in electrified areas, including rerailing at sub-stations and sections huts.

When the civil operations have been completed, the signalling (when on site) representatives shall then sign the NRF 003 and the handsignaller protecting the civil operation may be withdrawn.

The signalling maintainer shall test that the track relay operates correctly in accordance with the procedure for track circuit testing. Tests shall be carried out to see that the tracks are correctly phased, if the track connections have been disturbed or insulated rail joints installed. The signalling maintainer shall also carry out train shunt checks with a train on the track circuits affected by the rerailing to ensure correct shunting of the track by the train wheels before the signals are brought back into use. (See procedure SMP 25 for track circuit testing).

If train stops have been effected by the rerailing they shall be regauged and any temporary bridging removed before the work is certified correct and the signals placed back in order. The NRF 003 form may then be completed and signed by the worksite supervisor and the signalling maintainer, and the handsignallers withdrawn.

### **1.3 Short Sections of New Rail (refer also to SMP 25)**

Whenever there is replacement of rails in points or at blockjoints, or for other short sections of rail in the vicinity of the clearance point between converging tracks and near the interface between adjacent track circuits, then the signalling maintainer is to be in attendance and ensure that the rail surfaces are clean before the track circuit is restored into use.

When block joints are renewed with a glued joint a dangerous situation could arise if a rear bogie of a train came to a stand on the new rail of a glued joint which is located just at the clearance point between two converging tracks. Short sections of new rail within a tuned loop might also cause similar problems if critically located, in respect of clearance points between tracks.

In these cases, the civil engineering staff are to grind the surface of the rail to clean off any protective coating, rust or other contamination and provide a shiny metallic surface for good electrical contact with the wheels. Alternatively restoration of the track circuit is to wait until the passage of trains has cleaned the rail surface to ensure shunting.

Maintenance Supervisors and signalling maintainers are to liaise with their civil engineering counterparts to ensure they are aware of the rail cleaning requirement in these instances.

### **1.4 Rerailing affecting parallel bonding**

Where rerailing affects parallel bonds the signalling maintainer must ensure that the parallel bonds are correctly and effectively connected after the rerailing and that the portion of the track circuit connected via the parallel bonds is tested to shunt correctly before the track circuit is booked back into use.



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## 1.5 Guidelines for the use of Temporary Rail Bonds (Refer NWT 318)

### 1.5.1 Scope

These guidelines set out the circumstances under which temporary rail bonds may be applied to keep track circuits working and or maintain traction return currents during civil works, where it is necessary for the rail to be cut.

They are designed to assist Signal Engineers or their specifically delegated signalling representatives in the determination of the rail bonding requirements, and define the requirements for standard Temporary Rail Bonds.

These guidelines apply to both electrified and non-electrified areas.

*Note:* These guidelines do not preclude the use of shorting bonds being used in-conjunction with bonding around the break. When used in this configuration the shorting bonds are to be placed across the rails (4 foot) either side of the break.

### 1.5.2 Restrictions

In double rail AC track circuit areas temporary rail bonds can only be placed around the rail break in conjunction with shorting bonds placed across both rails (4 foot) of the line either side of the break.

In single line electrified areas the use of temporary rail bonds by civil engineering personnel is **not** permitted due to the special arrangements required to maintain the traction return current.

In interlocked areas the application of temporary rail bonds by civil engineering personnel is **not** permitted and any temporary bonding is to be placed by a qualified signalling representative except in areas where outer home signals are provided and the intervening track circuits do not impact on the operation of the Interlocking.

### 1.5.3 Circumstances

In order to allow particular civil engineering works which would otherwise affect the operation of signal/s to proceed with the minimum disruption to rail traffic, track circuits may be kept working by the placement of an approved Temporary Rail Bond around the rail break by suitably instructed civil engineering personnel in connection with the following work:

- Pulling back for expansion or creeping
- Welding of joints
- Renewing of defective fishplates
- Replacing a length of rail not more than can be reasonably accommodated between the connections of the standard 6 metre temporary rail bond

### 1.5.4 Applicable Procedures

The conditions laid down in Network Rule NWT 318 regarding the issue of *Temporary Rail Bond Approval form NRF 013* are to be adhered to.

### 1.5.5 Competence

All duties allocated to the Signal Engineer under these guidelines may be performed by a specifically delegated signalling representative but may not be further delegated.

The Signal Engineer must ensure that the civil person/s placing temporary rail bond/s have been suitably instructed and are competent to perform the task. This will necessitate the Signal Engineer providing instruction and practical demonstration on the placing of the temporary rail bond where civil staff are not familiar with the procedure.

The Signal Engineer must ensure that the civil personnel installing the temporary rail bond/s, understands that the bond/s are not to be removed until the break has been welded out or permanent bonds installed.

Where traction bonding is concerned, the Signal Engineer must ensure that the skill level required is not beyond the ability of the civil engineering staff who will be responsible for installing the temporary rail bonding and there will be minimum risk to personnel or system by the work and bonding methods.

### 1.5.6 Temporary Rail Bonds

The Temporary Rail Bond must be to an approved design fitted with approved rail clamps. The maximum length of the Temporary Rail Bond must not exceed 6 metres. (This will generally limit the maximum rail cut to approximately 4.8 metres, but note that this is only an approximation and is not to be taken as the specified maximum). Temporary rail bonds used as shorting bond are to be limited to 2 metres in length.

Signal Engineers are responsible for the issue of temporary rail bonds, limiting their issue to two 6 metre bonds and two 2 metre bonds per work team.

Temporary rail bonds must be inspected every 6 months to assess their condition and effectiveness. Each bond and its associated rail clips are to be uniquely numbered and Signal Engineers are to fix tag/s showing this number and the inspection date prior to issue and update and or renew the tag/s on subsequent 6 monthly inspections. The Signal Engineer shall keep a 'register' specifically for the purpose of recording the above mentioned details.

Where a bond is or may be used in electrified areas, special attention must be made of the bond's condition and where there is evidence of damage to the cable or rail clips the bond should be replaced.

### 1.5.7 Electrified areas

In electrified areas special consideration must be given to maintaining the traction return path.

In multiple line electrified areas, civil engineering staff are to be instructed that only one rail may be broken at any one time between adjacent traction sub-stations.

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### **1.5.8 Non Electrified areas**

In non electrified areas, the civil engineering staff are to be instructed that at any one locality, only one rail joint is to be broken or rail cut made in each rail of a line and cuts / breaks shall be made at no more than two positions at any one time. A locality for the purpose of these guidelines shall mean an area within a worksite where the breaks in the rail are opposite or in close proximity to each other.

### **1.5.9 Special Situations**

Where the rail cut exceeds the distance where the maximum length Temporary Rail bond can be installed, or falls outside the circumstances listed in these guidelines, or because of the complex nature of the traction return or track circuit bonding at the proposed work location, e.g. certain single line areas, outside substations / section huts, complex Interlocking, the work is to be considered a rerailing and the appropriate network rules and procedures in Signalling Maintenance Procedures (SMP 00) are to be followed.

Where a circumstance arises and any doubt exists as to whether these guidelines address the situation, the matter is to be referred to the ARTC General Manager ISP or nominated Signalling representative for determination.