AUSTRALIAN RAIL TRACK CORPORATION LTD

Discipline: Engineering (Signalling) **Category: Standard**

Failures

SMP 04

Applicability

New South Wales	✓	**CRIA (NSW CRN)**	✓

Primary Source

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Document Status

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1.4	8 June 2010	Standards	Manager Standards	Exec Manager SS&P 25/06/2010	CEO

Amendment Record

Version	Date Reviewed	Clause	Description of Amendment
1.1	1 September 2004		Reformatting to ARTC Standard
1.2	14 March 2005	Disclaimer	Minor editorial change
1.3	21 February 2008	Forms; Various	Removed forms from standard, renumbered to SMP04F-01 and SMP04F-02 with own version control and corrected title of SMP04F-01 (SF J103). Position titles updated. Reference to superseded NSW Standard SMP 02 replaced with ESM-24-01.
1.4	8 June 2010	Various	Section 1 transferred to ESM-00-02. Sections 1.1, 1.2.1 and 1.2.2 transferred to ESM-00-04. Section 1.5 transferred to ESM-00-03. Section 1.6.1 transferred to ESM-00-05. Section 1.6.7 removed. Signalling forms removed and replaced with a link to the Engineering Extranet. Document transferred to new template and edited for grammar and style.

Contents

1 General

Refer to Section 1 General in ESM-00-02 Failures.

1.1 Reporting and Recording Failures

Refer to ESM-00-04 Management of Signalling and Control System Failures.

1.2 Failure Reporting

1.2.1 Detailed Report

Refer to ESM-00-04 Management of Signalling and Control System Failures.

1.2.2 No Cause Found Failure Forms

Refer to Section 2 Signal Failures Not Replicated in ESM-00-04 Management of Signalling and Control System Failures.

1.3 Failures Due to Other Disciplines

If signalling maintainers find a defect or failure in signalling apparatus, the cause of which is due to another discipline, they shall call the attention of the discipline representative concerned to the defect or failure. The cause of such failures shall be clearly described.

When signalling maintainers become aware of civil defects affecting the operation or reliability of signalling equipment, procedures for coordinating signal and civil work shall be followed to ensure the matter receives appropriate attention.

1.4 Safeworking Procedures

On arrival at a signal box to attend to a failure, the signalling maintainer in charge shall obtain details from the signaller and check any entry made by the signaller in the Train Register Book about the failure.

Before any points, signals, facing point locks, bars or any safeworking equipment in connection therewith is disconnected, the signalling maintainer in charge shall ensure the observance of ANWT 312 Infrastructure Booking Authority and ANPR 704 Using Infrastructure Booking Authorities.

When the failure has been rectified and the necessary tests carried out, the signalling maintainer in charge shall advise the signaller and check that an appropriate entry is made in the Train Register Book by the signaller.

1.5 Signalling Irregularities and Wrong Side Failures

Refer to ESM-00-03 Signalling Irregularities and Wrong Side Failures.

1.6 Failures – Action to be Taken

1.6.1 General

Refer to ESM-00-05 Damage to Signalling and Level Crossing Equipment.

1.6.2 Signal Failure

Defective signals that have failed 'right side' shall be made to remain at stop until the apparatus has been restored to correct working order.

In the case of a signal showing a less restrictive signal indication than conditions should allow, the signal next in rear must be disconnected and protected by appropriate safeworking procedures until the 'wrong side' failure is investigated by a Signal Engineer.

Refer to ESM-00-04 Management of Signalling and Control System Failures for information about failure reporting.

1.6.3 Failure of Electric Lever Locks on Signals

When the normal electric lever lock fails on a signal lever, the lever shall be kept in the normal position until the failure has been rectified.

When the normal electric lever lock fails on a distant signal lever, the signalling maintainer shall check that the distant signal displays 'caution' and the signal shall be kept at caution until the failure is rectified.

When the normal electric lever lock fails on a stop signal, the signal lever shall be maintained at stop and traffic shall be conducted in accordance with ANSG 608 Passing Signals at Stop and ANPR 746 Authorising Rail Traffic to Pass an Absolute Signal at Stop for passing that signal at stop.

1.6.4 Failure of Power Operated Points

When power operated points have failed, no attempt shall be made to unlock or move the points other than by normal operation from the lever (or operating console/panel/keyboard) unless:

- the points are disconnected and booked out of use

  or

- emergency facilities, interlocked with the signalling, are specifically provided to enable failed power worked points to be operated by hand (e.g. Emergency Switch Machine Lock (ESML) and Annett Key with attached crank handle, Emergency Operation Lock (EOL), plug connector and key).

In all cases the signaller shall be requested to place affected controlled signals at stop before the emergency facilities are taken and closely approaching trains shall come to a stand before the points are manually operated.

In all cases of hand operation of power worked points during failure or emergency, the controlling lever in the signal box should be placed to correspond with the position to which the points are operated by hand.

Power operated points shall not be moved out of correspondence with the interlocking unless they are disconnected electrically (and electro-pneumatically when applicable) and the signals reading over the affected points are disconnected and securely maintained at stop. Distant signals, or the equivalent of the distant signals, shall also be arranged to be maintained at caution.

Before traffic moves are permitted over power operated facing points that have failed, the requirements of ANSG 608 Passing Signals at Stop shall be observed.

After the emergency operating facilities have been returned to their cabinet:

- the facing points do not have to be clipped and locked as long as the detector light on the signallers indicator diagram shows that the points have been correctly set

  or

- the facing points must be secured in the correct position by point clip and SL lock when the detector light on the signallers indicator diagram shows that the points have not been correctly set.

In the case of power worked trailing points, the authorised employee must operate (wind) the trailing end of the points first and the hand signallers shall ensure that all points on the intended route are in the correct position for the train to proceed.

Under these conditions, signalling maintainers shall request that trailing points be clipped for hand signalled moves to avoid damage to point machines due to run throughs.

1.6.5 Failure of Plunger Locks on Electro-Pneumatic or Isolating Relays on Electrically Operated Points

In the event of a failure of the plunger lock on electro-pneumatic points or the isolating relay on electrically operated points, the signalling maintainer may release the plunger lock, or isolating relay, at the points, on each separate occasion as required, to enable the points to be operated from the signal box.

If the plunger lock or isolating relay is not effectively locking and preventing the irregular movement of the points, then the points must be regarded as being defective and no traffic movements must be made over them until they have been secured by clip and lock.

1.6.6 Failure of Point Detection Due to Damage

When a failure of electrical point detection is caused by damage or other reason that requires the replacement of a significant part of the points detection mechanism and, if it is necessary to avoid significant disruption to traffic until it can be rectified, it will be permissible on authority being given to take emergency action to bridge the affected detection contacts to allow the normal clearance of signals leading over the diamond crossings or over the trailing end(s) of the defective points in question.

The emergency action shall be as prescribed in SMP 09 Disconnection of Signalling Apparatus and ESM-24-01 Bridging or False Feeding of Signalling Circuits.

1.6.7 Failure of Train Stops

This section is no longer applicable to the ARTC Network and has been removed.

1.6.8 Failure of Level Crossing Protection Interlocked Gates or Boom Barriers

In the event of a failure of interlocked boom barriers, or when carrying out repairs to this equipment which may interfere with the interlocking, traffic must be conducted over the level crossing in accordance with ANGE 218 Type F Level Crossing Management and ANPR 715 Protecting Type F Level Crossing.

The fixed signals protecting the interlocked level crossing shall be disconnected and the associated distant signals or equivalent shall be arranged to be securely maintained at caution, and traffic conducted past the protecting signals in accordance with the applicable Network Rules and Procedures.

Hand signallers shall be provided in accordance with ANPR 715 Protecting Type F Level Crossing in event of failure or when work is being carried out which affects the normal operation of the level crossing.

1.6.9 Failure of Track Circuits

Track Failures General

In the event of a track circuit failure, no attempt shall be made to clear any of the signals controlled by the track circuit by manipulating the track circuit relay, bridging across the track circuit relay contact terminals and so on.

The signals controlled by the track circuit shall remain at stop until the track circuit is again in working order, and traffic shall be conducted past them in accordance with ANSG 608 Passing Signals at Stop for passing the signal at stop.

Track and indication locking controlled by a failed track circuit may be released by the signalling maintainer only as prescribed in SMP 06 Release of Track Locking or Indication Locking.

Tracks Failing to Shunt

When rails in sections of a track circuit are in such a condition that vehicles cannot be relied upon to shunt the track relay, the signalling maintainer shall disconnect and book out of order all signals, points or level crossing protection affected by the track concerned until satisfied that a vehicle will properly shunt the track relay.

When the defective track controls the lock on any point lever, the points concerned shall be clipped and locked until such time as an effective shunt has been obtained.

The signalling maintainer, when booking the equipment concerned out of order, shall complete the ANRF 003 Infrastructure Booking Authority form, confirm that an entry is made in the Train Register Book and signed and exhibit a list of the defective track or tracks in the signal box until they are again in order. In all cases, where doubt regarding the proper shunting of a track circuit exists, signalling maintainers must immediately inform their maintenance supervisor by telephone, advising the circumstances and action taken.

Broken Rails

Signalling maintainers who become aware of a broken rail that is a danger to rail traffic are to arrange for the immediate protecting signal(s) to be placed at stop and disconnected, for a hand signaller to be provided (CTC areas excepted) and for the attendance of the civil representative.

Where the broken rail and track circuit failure is causing significant delays due to points being inoperable, or more than one signal or home/starting or starting signals (in CTC areas) are being held at stop, the signalling maintainer, after receiving assurance from the civil engineering employee and confirmation from the signaller that temporary repairs have been made and the line is fit for traffic, may place a temporary bond around the break and restore the disconnected signal(s).

1.6.10 Relay Interlockings – Relay Failure

In standard relay interlockings, if a failure occurs to the interlocking circuits resulting in a failure of a reverse relay in the case of a signal lever, or a reverse or normal relay in the case of a point lever, or release switch lever, traffic shall be conducted in accordance with ANSG 608 Passing Signals at Stop until the defect is rectified.

In route control interlockings, should a failure occur of a route reverse lock relay (RLR or RUR) or release switch or point (NLR or RLR), traffic shall be conducted in accordance with ANSG 608 Passing Signals at Stop until the defect is rectified.

On no account shall any of these relays be lifted, or unplugged and replaced by a relay in the up position.

Where magnetically latched relays are replaced, the replacement relay shall be magnetically delatched prior to being placed in the circuit.

1.6.11 Failure of Section Control Relays in Single Line Track Control Sections

In the event of a failure of the section control relays in single line track controlled areas and with pilot working in use, the signalling maintainer may temporarily bridge out (in accordance with ESM-24-01 Bridging or False Feeding of Signalling Circuits) the half pilot staff contacts at each or either end of the section for testing purposes, provided that the starting signals at both ends of the single line section are otherwise disconnected and booked out of use.

2 Signalling Forms

2.1 SMP04F-01 No Cause Found Failure Report

The SMP04F-01 No Cause Found Failure Report is available on the ARTC Engineering Extranet.

2.2 SMP04F-02 Failure Recording Sheet

The SMP04F-02 Failure Recording Sheet is available on the ARTC Engineering Extranet.