

Booking Signalling Equipment Out of Use

ESP-00-03

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Amendment Record

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A.0	Mar 25	All	Document renumbered from SMP 08. Clarified requirements for Booking Signalling Equipment Out of Use based on the suggestions from the stakeholders. Updated testing requirements before booking back signalling equipment into Use.

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1 Introduction

1.1 Purpose

This document provides the signalling procedure for booking out signalling equipment.

1.2 Scope

The scope covers all signalling equipment and applies to the entire ARTC network.

1.3 Document Owner

The Manager Engineering Services is the Document Owner. For any query, initial contact to be made at standards@artc.com.au

1.4 Responsibilities

Signalling maintenance team or contractors working on the ARTC signalling equipment are responsible for implementing the process covered in this document.

1.5 Reference Documents

The following documents support this standard:

- NSW ARTC Network Rules and Procedures
- TA20 ARTC Code of Practice for the Victorian Main Line Operations
- National Code of Practice (CoP) ARTC addendum
- ESM-00-12 Disconnection of Signalling Apparatus
- ESIM-00-03 Signalling Irregularities and Wrong Side Failures
- ESP-21-01 – Bridging or False Feeding Signalling Circuits
- ESP-20-01 Signals Rail Safety Worker Competence Procedure

1.6 Definitions

The following terms and acronyms are used within this document:

Term or acronym	Description
ARTC	Australian Rail Track Corporation
IBA	Infrastructure Booking Advice
NCC	Network Control Centre
NCO	Network Control Officer
Network Control Officer	A Network Controller for an unattended location, a delegate carrying out some functions of a Network Controller.
Network Controller	A Competent Worker who authorises and may issue, occupancies and Proceed Authorities, and who manages train paths to ensure safe and efficient transit of rail traffic in the ARTC Network.
Signal Maintainer	Competent persons holding the correct ARTC competencies
Train Control Graph	A diagram showing operational information for a train control area.
Train Register Book	A book used in signal boxes, staff huts or at block posts to record information about the condition of the line or the movement of rail traffic.

2 Requirements for Booking out the Signalling Equipment

Signalling equipment is referred to as “booked out of use”:

- a. When there is manual intervention to secure signalling equipment in a safe, de-energised or locked position so that it will not be operated as part of the safeworking system for the signalled movement of trains.
- b. Alternatively, when the equipment is manually disconnected from the interlocking and this intervention formally documented and signed accordingly on Infrastructure Booking Advice form ANRF 003 and in a Train Register Book or in other documents provided for the purpose.

The requirement to book signalling equipment out of use each time may not always be necessary. Depending on the level of protection required and relative risk level for a specific situation, other means such as blocking facility may also be used.

Network Control officers (NCO) may temporarily book controlled signalling equipment out of use by appropriately applying blocking facilities to the signalling equipment concerned. In these cases, NCO makes an entry in the Train Register Book or Train Control Graph. Where signalling equipment is being worked on to rectify a failure and if work will not interfere with the safe operation of the signaling system, then it is sufficient to request the NCO to apply blocking facilities. However, by itself, this is not an acceptable level of protection if signalling equipment is required to be disconnected from the interlocking.

Signalling maintainer may disable signalling equipment to prevent its operation by removing electrical power and/or by other means. This will not require booking the signalling equipment out

Requirements for Booking out the Signalling Equipment

of use. The NCO shall be advised of all works that disables signalling equipment and shall be requested to apply blocking facilities on the respective train control system. Some examples are as below.

- During the inspection and rectification of the failure
- During the inspection and testing of signalling equipment to certify its correct operations
- Work which does not interfere with the safe operation of the signalling system

When signalling maintainers are required to book signalling equipment out of use, they should disconnect the equipment (except in particular signalling irregular investigations where it may be necessary not to disturb equipment which has failed wrong-side or is suspected to have failed wrong side). They shall also request the NCO to place blocking facilities on the respective train control systems. Disconnection should be carried out as described in procedure ESM-00-12 "Disconnection of Signalling Equipment". In circumstances where it is safe to do so and where there is no possibility of endangering rail traffic movements, the Signal Maintenance

Engineer/Signal Engineering Manager can authorise booking out of signalling equipment without disconnection, for example, when the corridor is closed to all rail traffic.

Signalling maintainers are to use Infrastructure Booking Advice form ANRF 003 to book signalling equipment out of use and back into use in accordance with Network rules & Procedures in order to ensure that there is an understanding reached with the NCO of the work and the safeworking precautions to be taken, and to ensure that the affected signalling equipment is properly certified fit for use before being booked back into use. Some examples are as below:

- When signalling interlocking apparatus is disarranged.

When signalling equipment is disconnected from the interlocking, (includes temporary bridging of contacts of circuit control devices)

when signalling equipment that has been disconnected from the interlocking is restored to use.

- When signalling trackside equipment is rendered inoperative by disconnection of the power to motors and mechanisms and/or to control devices (but the equipment remains connected to the interlocking) and the equipment is left unattended or requires the provision of handsignalers for traffic movements.
- When work is being carried out on signalling equipment or circuits and there is risk of endangering the safe operation of the signalling system, or risk of incorrect restoration which could cause a signalling irregularity, or there is otherwise a risk to the safety of the line.

Signalling maintainers are responsible for compiling form ANRF 003 with the NCO where work is to be carried out which involves disarrangement of the interlocking apparatus, or disconnection from the interlocking of signals, points, facing point locks, locking bars, detectors, level crossing gates, boom barriers or type F flashing lights, or of track circuits affecting any of the foregoing.

It may be necessary to disconnect, and maintain in a safe state, other signalling equipment which protects and interlocks with the signalling equipment that is disconnected from the interlocking or is affected by disarrangement of the interlocking apparatus.

Additional risks to operations (e.g. special working as a result of IBA), blocking facilities applied by the Network Control Officer, and the alternate signalled routes that are available, not affected by the disconnected equipment, shall be considered. This consideration shall be subject to the assessment conducted by a signal maintainer in consultation with the signal engineer and the

implementation of appropriate mitigation to bring any identified risks to an acceptable level to ensure safety and to maximise the use of the signalling system for train operations. These protecting signals and points, while not to be disconnected 'from the interlocking', are to be disconnected and maintained in a safe position (by removal of the power supply to the motors, mechanisms and/or control devices) and included on the form ANRF 003. For example, if a signal has two routes through a points and signal maintenance team is working on the main line track circuit then only main line signal route may require to be booked out, other signal routes may not require to be booked out depending upon the actual work and site-specific risks. Another example is when the maintenance team is working on points in the overlap of the signal then that signal can be booked out.

If the work affecting the signalling is being carried out under total possession, the affected signalling equipment which is to be disconnected from the interlocking required to be booked out of use on form ANRF 003. Associated protecting signals and points may be booked out if the signal maintenance engineer identifies any risk to the rail traffic movement or risks to the signalling system.

With an objective to optimise the IBAs and resources during possession, Signal Maintenance team is required to work out the required essential IBAs, considering both, safety and operational impact in consultation with the operations team in the planning phase of the possession.

Where signalling equipment is disconnected in order to render it inoperative and out of use for traffic operations, (but still safely connected to the interlocking), the signalling maintainer shall also compile the ANRF 003 form and include this equipment as booked out of use.

In all cases, completing and signing form ANRF 003 for restoring signalling equipment to use, constitutes certification that the interlocking apparatus and signalling equipment that was disarranged or disconnected, or which could have been affected, has been tested and is safe and fit to restore to normal use.

3 Protection of Derailment Sites

Signalling equipment may not be required to be disconnected in certain situations including major incidents and signalling irregularities. This is required to preserve evidence where the signalling system integrity may be in doubt.

Operational rules cover the protection arrangements of derailment sites. At derailment sites where a Protection Officer cannot protect the area with a Work on Track Authority, the signalling maintainer may disconnect signalling equipment to protect the site.

Signal routes through points which are disconnected and held in the opposite position to lead clear of the obstruction, need not be disconnected, but signals with their overlap extending over an obstructed section of track shall be disconnected. In exceptional circumstances, disconnection may be limited to the immediate protecting signals and points provided there is no risk of collision with train over-running these protecting signals and provided the approval of controlling signal engineers is obtained.

4 Testing of signalling Prior to booking back into use

Before booking back the signalling equipment into operational use, signalling maintainer shall identify the testing required with reference to the ESC-21-03 – Inspection and Testing Principles. As a minimum, the equipment shall be function tested before booking it back into use.

In many cases testing to certify the equipment will involve operating the “booked-out” equipment from the NCO’s control panel and this shall be done with the NCO’s agreement under strict controls directed by the signalling maintainer in charge, in circumstances where it is safe to do so and where there is no possibility of endangering rail traffic movements while it is being tested but still booked out of use.

5 Failure Investigation (in cases where investigation and rectification would not affect safety integrity)

When signalling equipment is failed and is being inspected and tested to find and fix the failure, or is being inspected and tested to certify its correct operation, and where such inspection, testing and rectification work will definitely not interfere with the safe operation of the signalling system, then it will not be necessary for signalling employees to book out and disconnect equipment, although NCO may be requested to keep associated signals at stop, as required and apply blocking facilities.

6 Work which could affect safety integrity

Whenever there is a possibility of inspection or testing or any other work on signalling equipment interfering with the safe operation of the signalling system, then the signalling equipment being worked on and the affected signals and points shall be booked out of use and disconnected in agreement with the NCO.

This is done to prevent the normal passage of trains past any signals, or over any points or level crossings, whose safe operation may be jeopardised by the work or by the testing of the completed work before it is booked back into use.

As a simplified example, if there is rewiring work on points detector contacts in a detection circuit then, in the normal case, the signal routes (including overlaps) which detect those points would be manually disconnected and booked out of use together with the points, even if the detector relay itself is not touched and is disconnected at cable links and isolated from the work on the detector contacts. (If the signal routes requiring the detector relay circuit were not disconnected and booked out of use then, if the detector circuit were wrongly reconnected, it may be possible that signals could be unsafely cleared, perhaps inadvertently).

When the rewiring work is completed the detector relay would be reconnected and the detector circuit would be fully inspected, tested and certified to be physically and functionally correct, while the affected signals remained disconnected. In this particular example, because it could be guaranteed that the detector relay itself and its contacts were isolated from the work and not touched, no further testing of the interlocking and controls would be necessary, and the disconnected signals could be reconnected and booked back into use together with the points. Notwithstanding, because the signals have been disconnected, they are to be operated to test they are in working order before being booked back into use; beforehand, the NCO is to be informed that the signals are being reconnected for test but are still out of use, and a check is to be made that any handsignallers (if used) are advised accordingly, and that there is no rail traffic approaching that could be affected by the signal clearing during the testing.

Note: *Signalling equipment is disconnected 'from the interlocking' when the disconnection affects the integrity of the interlocking provided for the safety of rail traffic movements.*

Other than for power supplies to signal lights, level crossing warning equipment and the like, the removal of power supply fuses, and the opening of circuits at terminal captive links or link pins or at indexed plug connectors, (if this secures signalling equipment in a de-energised, fail-safe position), would not be considered as disconnection 'from the interlocking'.

The 'interlocking' is that part of the signalling system which applies the interlocking and track locking between conflicting routes, signals, points, level crossing warning systems and which applies track circuit control to the clearance of signals and level crossing warning systems, and it includes all the vital control, indication and detection equipment and circuits that provide and prove correspondence between the respective signals, points, track circuits and level crossing warning systems and the rest of the 'interlocking'.
