Discipline
Engineering Standard – NSW

Category
Signalling

Title
Introduction to Signalling Maintenance Procedures

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The technical content of this document has been approved by the relevant ARTC engineering authority and has also been endorsed by the ARTC Safety Committee.

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About This Standard

This Standard defines the requirements to be followed when maintaining, interfering with and attending to failed conditions of the operational signalling infrastructure and systems.

The Standard forms the descriptive part of a maintenance procedures manual that includes 47 parts detailing the requirements to be followed when dealing with the various situations as mentioned above and as shown below.

01 Introduction to Signalling Maintenance Procedures
02 Bridging or False Feeding of Signalling Circuits
03 Accidents or Derailments - Action to be Taken
04 Failures
05 Damage to Signalling Equipment Including Cables
06 Release of Track Locking or Indication Locking
07 Apparatus Seldom Used
08 Booking Signalling Equipment Out of Use
09 Disconnection of Signalling Apparatus
10. Testing and Certifying Equipment Worked on or Altered During Maintenance
11. Like for Like Renewals, etc
12. Repair/Replacement of Signalling Wires
13. Field Parallelling of Signalling Contacts
14. Document Control of Signal Plans and Circuit Books Issued to the Field
15. Location of Trackside Equipment
16. Notification of Whereabouts and Liaison With Signallers
17. Maintenance Responsibilities, Frequencies, Recording
18. Depot Overhaul of Vital Signalling Equipment
19. Cleanliness & Lubrication of Mechanical Signalling Equipment
20. Security, Fire Protection, Weather Proofing and Cleanliness of Signalling Equipment, Housings and Locations
21. Minor Signalling Works on Maintenance Areas Involving Installing, Removal or Altering Signalling Equipment
22. Testing Interlockings - Maintenance Responsibilities
23. Insulation Inspection and Testing
24. Vital Signalling Relays
25. Track Circuits
26. Rerailing - Precautions to be Taken
27. Traction Return (1500V DC)
28. Points Detection Test: Separate Electrical Detector
29. Facing Point Lock Testing - Mechanical
30. Facing Point lock and Detection Testing - Combined Point Machine
31. Maintenance of Signal Sighting and Signals
32. Solid State Interlocking (SSI)
33. Electric Train Staff Instruments
34. Custody, Storage and Dispatch of Staffs and Keys
35. Use of Master Keys and Staffs
36. Level Crossings
37. Microtrax Coded Track Circuits
38. Microlok Computer Based Interlocking
39. Westrace Computer Based Interlocking

40. Use of Radio Transmitters Near Electronic Signalling Systems
41. Pole routes
42. Not Issued (To be Revised)
43. Guidelines for Irregularity Inspection and Testing to Determine Cause
44. General Signalling Maintenance Management, Administration and Supervision Responsibilities
45. Surveillance Inspections
46. Guidelines for the Safe use of Temporary Recording, Monitoring and Logging Equipment on Signalling Systems
47. Calibration of Tools and Instruments for Signalling Applications

Document History

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List of Amendments –

ISSUE	DATE	CLAUSE	DESCRIPTION
1.1	01/09/2004		▪ Reformatting to ARTC Standard
1.2	14/03/2005	Disclaimer	Minor editorial change

Contents

1 INTRODUCTION

The purpose of these procedures is to bring to the attention of signalling maintainers engaged in work affecting installed signalling apparatus the essential features, standard practices, and special instructions, so that traffic movements can be made safely yet without delay.

The Network Rules and Procedures Manuals direct how work affecting the operation of signalling shall be safely carried out. All signalling maintainers issued with Network Rules and Procedures Manuals shall be held responsible for complying with the relevant safeworking procedures contained in them.

The standard practices and procedures contained in this Signal Manual "Signalling Maintenance Procedures" shall be read and carried out in conjunction with the Network Rules and Procedures Manuals which they are intended to supplement, and in no way supersede.

Each signalling maintainer who has duties prescribed by these signalling maintenance procedures must have a copy of this manual and shall comply with the prescribed procedures.

Wherever terms such as signal engineer, signalling maintainer, mechanical maintainer, linesman, maintenance supervisor and such like are used it shall be taken as read that the respective persons are suitably trained, competent and accredited to perform the specific task required in the context referred to. If they are not suitably competent and accredited then they must arrange for others who are suitably competent and accredited to carry out the task.

Signalling employees shall familiarise themselves with, and acknowledge receipt of, new and altered procedures, insert them in the appropriate position in copies of this manual and destroy superseded pages.

Where individual responsibility is not explicit in the text of these procedures, signalling employees shall contact their Controlling Officers for clarification.

For the purpose of this manual the Maintenance Signal Engineer and signal maintainer, unless otherwise stipulated shall mean a trained, qualified and authorised person who has been accredited by the appropriate Signalling discipline licensing board in Signalling Safeworking.

The Maintenance Signal Engineer is the senior signal engineer responsible for the signalling infrastructure on his/her region/district and unless otherwise stipulated may delegate the various tasks specified to them in these procedures to another accredited signal engineer on their region/district, however in doing so, does not dispense with the responsibility and Maintenance Signal Engineers are still ultimately accountable for ensuring the task/s are appropriately handled and completed safely and in accordance with these procedures.

Note: Whenever maintenance of the signalling system requires additions or modifications to the signalling system or its safety related components then the requirements of specification SCP 08 to SCP 12 shall be observed.

Users of these procedures shall promptly bring to the attention of the Principal Engineer Signals Design for his/her determination any perceived omission, error, ambiguity, inconsistency or lack of clarity with these Procedures as well as suggestions for improvement.

SOME BASIC REQUIREMENTS.

Some basic requirements relating to maintaining the signalling system are set out below. They are described in detail in the procedures in the following sections of this Manual.

1) The installed signalling system and its components are to be maintained to prevent signalling system failures and associated train delays, and to ensure the safety provided by the system is maintained throughout its operational life.

2) Failed signalling equipment is to be attended to and restored for operational use without undue delay.

3) Details of signalling maintenance and signalling failures and irregularities are to be recorded and analysed to determine any corrective action necessary and to ensure equipment/system safety and reliability levels are maintained.

4) Only signalling maintainers using authorised practices, test equipment, tools, materials and equipment are to maintain the installed signalling system or its components. Test equipment and tools in use are to be in proper working order.

5) Persons who are not suitably accredited shall not have access to enclosures housing vital signalling equipment except under the supervision of a signalling maintainer or as permitted in accordance with stipulated conditions.

6) Only suitably accredited signalling maintainers, or persons directly supervised by the signalling maintainers, are to disconnect or connect to the signalling system equipment and circuits.

7) The movement of trains must be adequately protected when any maintenance action or other interference impairs or could impair the protection provided by the signalling system or could affect the safety of the line.

8) Where the interlocking is disarranged or vital signalling equipment is disconnected from the interlocking, or is dis-assembled, or has safety critical adjustments altered, then its safe operation must be verified before it is certified fit for operational use.

9) Signalling equipment which has failed in an unsafe manner must be taken out of service and the train movements affected must be immediately protected.

The irregularity must be fully investigated, the defect rectified, and the equipment must be tested and certified as operating safely before being restored to use for traffic operations.

Subject to the former, should signalling apparatus be defective in any manner which potentially might endanger traffic operations it is to be immediately repaired or replaced, if practical. If it cannot be immediately repaired or replaced its operation must be discontinued and traffic operations must be protected. Details must be immediately reported to Controlling Officers.

10) When any function of the signalling system affecting traffic operations is to be taken out of service, the system operator of the affected area is to be advised.

11) Release of track locking or signal indication locking must only be given as prescribed.

12) Temporary bridging of contacts of vital signalling control devices must only be carried out as prescribed.

13) Trainstops must only be manually suppressed for train services as prescribed.

14) Where locking facilities are normally provided, the signalling equipment is to be kept locked to prevent unauthorised interference.

15) Alterations or additions to the configuration of the signalling system or its components must not be made unless properly authorised.

16) Prior approval of the ARTC General Manager ISP or nominated Signalling representative is require before any aspect of the operational signalling system, vital or non vital, that could affect the safety and/or reliability of the system is introduced.

17) This requirement includes, the application of experimental, new or modifications to design, signalling systems, signal equipment, train control systems, standards for manufacture, construction, operations, maintenance, disposal and procedures and practices, including practices that were not specifically covered by documented standards but for which a documented standard should apply.

18) Signalling plans, diagrams and circuit books for operating and maintenance use must be available to those who need them to carry out their duties and be maintained up to date.

19) Off-site repair and overhaul of vital signalling equipment shall be authorised and controlled to ensure the equipment is restored to the required specification and standard before being re-used.

20) Temporary repairs of vital signalling equipment shall be to an acceptable and safe standard and procedures shall ensure the temporary repairs are brought up to the permanent standard before they present an unacceptable risk to the safe and reliable operation of the signalling system.

21) Malicious damage or interference to vital signalling equipment or circuits must be reported promptly to the controlling officer.

22) Test equipment for measuring signalling system safety and reliability parameters is to be calibrated where required to verify acceptance/rejection criteria.

Signalling maintenance shall be managed and performed to meet the relevant requirements of Australian Standards for Railway Safety Management AS4292 Part 1 “General and interstate requirements” and Part 4 “Signalling and telecommunications equipment and systems”.

