



AUSTRALIAN RAIL TRACK CORPORATION LTD

Discipline
Engineering

Category
Process Procedures

Removal of Signal Post Telephones

PP-165.1

Applicability

ARTC Network wide	
New South Wales	✓
Western Jurisdiction	
Victoria	

Primary Source
(New Draft)

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List of Amendments

Issue	Date	Clause	Description
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1. Purpose

The purpose of this standard is to document the procedure to be followed by maintenance staff when removing signal post telephones from the NSW rail network.

2. Scope

This procedure covers the following:-

- The conditions which must be met in order to removal a signal post telephone, and
- The procedure to be followed when removing the signal post telephone.

3. Background

ARTC has removed signal post telephones from the tracks under its control in Victoria, South Australia and Western Australia.

Telstra CDMA coverage of ARTC rail network is already extensive. The true extent of CDMA coverage on the ARTC rail network, including the NSW Leased and Hunter Valley rail lines was determined jointly by ARTC and Telstra by running a wagon equipped with RF monitoring equipment over all rail lines.

The NSW rail lines are also covered by a number of satellite telephone service providers.

In October 2004 the Federal Government announced the allocation of \$45M to eliminate the CDMA coverage 'holes' identified by this survey across the entire ARTC rail network. CDMA blackspots are expected to be progressively eliminated on the ARTC network over the period Jan 2006 – Dec 2007. This program will be updated to provide Telstra 3G network coverage in lieu of the CDMA coverage during this period.

Since the take up of the 60 year lease for the ARTC-managed rail network in NSW on 4th Sep 2004, ARTC has issued all NSW field work groups/teams and managers with CDMA and/or satellite mobile telephones. As a result ARTC field maintenance and management staff no longer rely on the use of SPTs to contact Signaller or Controller staff.

4. ITSRR Approval

On 13 May 2005 ITSRR approved in principle the removal of Signal Post Telephones from the NSW Leased and Hunter Valley rail lines

5. Risk Mitigation

Approval is provided to remove SPTs from the NSW Leased and Hunter Valley rail network on the condition that CDMA coverage is available at the signal location.

6. Procedure

The following procedure is to be followed when removing a signal post telephone from the NSW Leased and Hunter Valley rail network. The major steps are:

- (a) Confirmation of CDMA radio coverage for the area from service supplier;
- (b) ARTC mobile test for particular location of signal post telephone;
- (c) Drawings and documentation for removal of the signal post telephone;
- (d) Complete the work and submit certified drawings for updating.

7. CDMA Service Supplier Coverage

It is essential that the CDMA service supplier has completed any work associated with providing the designated level of radio coverage for the respective area to have the signal post telephones removed. The Communications project manager or manager will provide details of the areas that the CDMA service supplier has confirmed have the infrastructure to provide the necessary level of radio coverage.

8. ARTC Mobile Test for particular Signal Post Telephones.

The ARTC shall conduct and confirm the results of the following tests prior to commencing the removal of the signal post telephones.¹ It is important that the CDMA calls can be made consistently and that the voice quality is sufficient for the voice recording systems in use at the signal boxes and train control centres. It is preferable that the ARTC Communications section establish a test telephone circuit that is connected to a channel on the Voice Recording systems for the respective area. Otherwise, in consultation with the signallers and train controllers, a standard telephone line shall be used for the conduct of the tests.

- The test shall be conducted using a standard CDMA handset as issued for ARTC maintenance staff. The phone operator shall be positioned adjacent to the respective signal and clear of any danger zones from the track or other hazards.
- The phone operator shall make 5 consecutive phone calls that are successful and meet the following criteria. The operator to achieve the 5 successful calls within a group of 8 calls. The phone calls shall be to the designated test line with voice recording.
- Each of the 5 calls shall be held for 100seconds without disconnection by the network.
- The operator shall talk for half the duration of the call, including at least at the start and the finish of the 100 seconds. The voice quality of the call as observed on the voice recording shall be at least level 3 or above on the attached scale for the recorded voice.
- CDMA coverage is to be judged as acceptable only if the caller and recipient can communicate in clear and intelligible manner that is understood by both parties.

If CDMA coverage is not judged as acceptable then the SPT is NOT to be removed from the signal post.

The results of the test are to be annotated onto the attached record sheet.

¹ Where CDMA coverage test call fails, ARTC shall use these results to report unsatisfactory CDMA coverage to Telstra.

9. Drawings and Documentation for Removal of Signal Post Telephones.

- 9.1.** The ARTC staff or contractors shall only remove signal post telephones provided the respective signalling and communications drawings for the equipment are available and are marked up for the changes and certified for the completed works.
- 9.2.** The track plan or signalling plan for the respective area indicates the locations of signal post telephones. The proposed removal of the signal post telephones is to be indicated on a copy of the relevant section of the signalling or track plan.
- 9.3.** The wiring connections to the signal post telephone are usually indicated in the relevant signalling circuit book for the area. In some cases this information may also be on a linewire diagram. The proposed removal of the signal post telephone and the changes to the wiring are to be indicated on a copy of the relevant circuits. The changes to the wiring are to be checked and authorised by an appropriately experienced engineer.
- 9.4.** Both sets of drawings are to be marked as Certified Construction Copy. A scanned copy of the proposed changes is to be entered into the drawing management system and a signalling job number issued for the work.

10. Removal of Signal Post Telephones and Certification of work

- 10.1.** If CDMA coverage is acceptable as detailed above and if the Certified Construction Copy of the drawings is available, then removal of the Signal Post Telephone may proceed. The removal can proceed in the following manner:
 - The SPT is to be removed from the signal;
 - The telecommunications cable connected to the SPT is to be cut as close as practical to the SPT to enable subsequent reuse of the cable at a later date if required.
 - The end of the cable is to be cut clean and protected with heat shrink tubing.
 - The telephone cable should be fed into the pole of the signal post and the access hole sealed with a plastic plug or other suitable device.
 - The other end of the telecommunications cable in the signal location hut or case is then to be disconnected within the signalling location. This shall be done at the incoming termination links. Where a party line circuit is connected in the field, then the point of connection to the party line shall be cut and terminated with heat shrink tubing.
 - Any circuits that are changed are to be tested that the remaining functions still operate correctly.
 - The Certified Construction Copy is to be marked up for the changes to the circuit and certified as correct.
 - This Certified Construction Copy is to be scanned and entered into the Drawing Management System. The signed hard copy is to be returned to the Signals Manager for the region for updating the master drawings. The signalling job system is to be updated to indicate the status of the work.
 - SPTs removed from signals are to be transported to an ARTC Provisioning Centre.

- The local ARTC Telecommunications technician is to be contacted to determine which SPTs should be retained as spares. SPTs not required to be retained as spares should be disposed of in accordance with ARTC policy.

11. Updating of Communications Records.

11.1. The attached record sheet is to be filled out for each Signal Post Telephone which is tested for removal. A copy is to be forwarded to the NSW Communications Manager (Office -Newton St., Broadmeadow). The original record of the test for the removal is to be kept 24 months.

12. CDMA Network and Voice Quality.

12.1. The Network and Voice Quality are important for reliability and usability of the CDMA network in the railway application. The attached table indicates nominal levels for Voice Quality on a mobile network.

Table 1. Voice quality of CDMA mobile network

Opinion Score Rating	Level of Distortion
5	Imperceptible
4	Just perceptible but not annoying
3	Perceptible and slightly annoying
2	Annoying but not objectionable
1	Very Annoying and objectionable

Alternative methods to test the CDMA signal strength at a location and the number and strength of pilot signals provide a more quantifiable result but are more difficult to test. Processes to perform tests in this manner may be submitted for approval.

Removal of Signal Post Telephones
NSW Leased Network and Country Rail Network

Name: _____ Position: _____

Employee No: _____ Team/Work Group Name: _____

Location/Line Sector: _____

A: CDMA Service Supplier confirmation of radio coverage: _____

C: ARTC Track Plan/Signalling Plan and Circuits available for (list all signals)

Signals: _____

Individual Signal Post Telephone Results

Signal: _____ Line: _____ Km: _____

B: ARTC Mobile Test: Date & Time Call to Test Number:

Date: _____ Time: _____ Test Number Called: _____

No. of Calls Made: _____ No. of successful consecutive 100 sec calls : _____

Voice Quality (level of distortion – see Table 1): _____

Confirmed - recorded voice meets requirement: Yes/No Signed: _____

D: Confirmation of removal of phone and certification of drawings.

Signal Job No: _____

Telephone removed and all work completed as per PP-165.1: Yes/No

Certified Construction Copy marked up and certified: Yes/No

Signed: _____ Date: _____

Individual Signal Post Telephone Results

Signal: _____ Line: _____ Km: _____

B: ARTC Mobile Test: Date & Time Call to Test Number:

Date: _____ Time: _____ Test Number Called: _____

No. of Calls Made: _____ No. of successful consecutive 100 sec calls : _____

Voice Quality (level of distortion – see Table 1): _____

Confirmed - recorded voice meets requirement: Yes/No Signed: _____

D: Confirmation of removal of phone and certification of drawings.

Signal Job No: _____

Telephone removed and all work completed as per PP-165.1: Yes/No

Certified Construction Copy marked up and certified: Yes/No

Signed : _____ Date: _____

***This record is to be kept for 24 months. A copy of this sheet is to be forwarded to
NSW Communications Manager (Newcastle Office)***