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Technical Note

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**Subject: Withdrawal of EP 08 00 00 04 SP Relative Positions of
Signals and Open Overlaps**

This technical note is issued by the Asset Standards Authority as a notification to remove from use RailCorp document EP 08 00 00 04 SP *Relative Positions of Signals and Open Overlaps*, Version 4.0.

EP 08 00 00 04 SP is a legacy document and should be used for reference purposes only. ASA Standard T HR EL 08002 ST *Relative Positions of Signals and Open Overlaps*, Version 1.0 supersedes this document.

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EP 08 00 00 04 SP

RELATIVE POSITIONS OF SIGNALS
AND OPEN OVERLAPS

Version 4.0

Issued October 2012

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Document control

Version	Date	Summary of change
	July 2008	Last Technical Review
3.0	May 2010	Application of TMA 400 format
4.0	October 2012	See Table below

Summary of changes from previous version

Summary of change	Section
Terminologies updated to align with current suite of Electrical standards	All
Title of document changed – “airgaps” replaced by “open overlaps”	Title
Heading of section on “Introduction” changed to “Scope and application”; application of document clarified	1
References updated	2
Contents updated and re-organised	3 & 4
Section added to set out requirements for OHW modifications at non-compliant overlaps	5

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1 Scope and application

This document sets out the requirements for positioning open overlaps in relation to signals in order to avoid pantographs bridging an open overlap whilst a train is held at a signal.

It is applicable to:

- Construction of new overhead wiring
- Rebuilding existing overhead wiring
- Installation or relocation of signals
- Modification of existing overhead wiring at or near open overlaps

2 References

2.1 Australian and international standards

Nil

2.2 RailCorp documents

<i>EP 08 00 00 01 SP</i>	<i>Overhead wiring standards for the electrification of new routes</i>
<i>EPD 0013</i>	<i>Technical reviews</i>
<i>EPE 0002</i>	<i>Mains installation (OHW, HV aerial lines, HV and 1500V cables) – Design competencies and authorities</i>
<i>ESG 100</i>	<i>Signal Design Principles – Part ESG 100.1 - Signals</i>
<i>RS00_0000_0000 MP</i>	<i>Passenger Fleet Rolling Stock Diagram Book</i>
<i>SPG 0706</i>	<i>Installation of Trackside Equipment</i>

2.3 RailCorp drawings

<i>EL 0045483</i>	<i>(Electrical Operating Diagrams Reference Sheet C) 1500 Volt sectioning diagrams – General symbology and notes</i>
<i>EL 0045485</i>	<i>(Electrical Operating Diagrams Reference Sheet E) 1500 Volt sectioning diagrams – Electrical sectioning identification</i>

3 Overlaps

Overlaps are provided for the termination of OHW wire runs, while allowing for:

- Smooth and secure passage of train pantographs
- An electrical connection from one wire run to the next, where applicable
- Sectioning of the overhead wiring if required
- Feeding of the overhead wiring if required

For most overlaps, the two sets of OHW "overlap" or run side-by-side for a distance so that a pantograph is in contact with the contact wires of both sets of OHW. At each end of the overlap, one set of OHW goes out-of-running by being raised up and moved to the side of the track and terminated via an insulator on an OHW structure.

Overlaps are classified as:

- Non-sectionable overlaps
- Jumpered open overlaps
- Switched open overlaps
- Open overlaps

See *EP 08 00 00 01 SP* and the RailCorp Engineering internet / intranet site for standard overlap arrangement drawings.

See drawing *EL 0045483* (Electrical Operating Diagrams Reference Sheet C) for symbologies for overlaps shown on 1500V sectioning diagrams.

See drawing *EL 0045485* (Electrical Operating Diagrams Reference Sheet E) for electrical sectioning identification.

3.1 Non-sectionable overlap

At a non-sectionable overlap, the two wire runs in the overlap are of the same electrical section. Electrical continuity through the wire runs is maintained through feeder jumpers across the wire runs. The wire runs can not be separated to become different electrical sections.

3.2 Jumpered open overlap

The wire runs in a jumpered open overlap are normally of the same electrical section. However, insulators are cut in the wires so that the wire runs can become different electrical sections by removing the feeder jumpers in the overlap bay.

3.3 Switched open overlap

In a switched open overlap, the wire runs are of different electrical sections or sub-sections. The two electrical sections or sub-sections are generally connected through a 1500V sectioning switch, ie the switch is normally closed. However, there may be installations at which the switch across a switched open overlap is normally open.

3.4 Open overlap

At open overlaps, the wire runs forming the overlap are of different electrical sections or sub-sections. Open overlaps are commonly installed at substations and sectioning huts to facilitate feeding of the overhead wiring.

4 Positioning of overlaps relative to signals

A risk exists at

- an open overlap, or
- a switched open overlap when the switch is open,

of a stationary pantograph bridging across the contact wires causing failure of the OHW. The risk is that the current flowing from a contact wire to the pantograph may cause the contact wire to be overheated locally and result in annealing and breakage of the contact wire.

To mitigate this risk, the relative position of such overlaps with respect to signals shall be such that a train standing at a signal will not have its pantographs in the overlap bay.

For guidance the dimensions of RailCorp passenger fleet rolling stock are as given in *RS00_0000_0000 MP*. For the purpose of this document, consider an 8 car suburban train to have a length of 170m and an 8 car intercity to have a length of 200m.

This restriction does not apply for the following types of overlaps:

- Non-sectionable overlaps
- Jumpered open overlaps
- Switched open overlaps for which the switches are normally closed

5 OHW modification at existing non-compliant configurations

It is recognised that a number of existing open overlaps do not comply with the requirements set out in section 4. Where the existing overhead wiring is to be modified at or near such non-compliant locations, a risk analysis shall be conducted by the OHW Designer. The risk analysis shall consider the following as a minimum:

- Likelihood of trains stopping at the signal
- Types of rolling stock on the line
- For each type of rolling stock, the positions of pantographs relative to the contact wires when the train is stopped at the signal. Allowance for a reasonable range should be made for the distance between the signal and the train stopped at the signal.

Mitigation measures to control the risk include:

- Relocation of the open overlap
- Relocation of the signal
- Re-designing the overlap configuration to shift the “scissor point” and/or reducing the area in which both sets of contact wires are “in running” in the overlap
- Change the open overlap to a jumpered open overlap, and install a section insulator for electrical sectioning. This option should only be considered once all other options have been ruled out.

The OHW Designer shall identify the presence of any non-compliant open overlap and provide a recommended design solution, based on the risk analysis and a cost benefit study, to the Discipline Head (Chief Engineer Electrical) as defined in *EPE 0002* at the System Definition Review stage of design as defined in *EPD 0013*.

5.1 Design documentation

Where a non-standard overlap configuration is used to mitigate the risk, an explanatory note shall be provided on the relevant OHW layout drawing. The location of the relevant signal shall also be shown on the layout drawing.