

# ISSC 35

## Guideline to Safe Work Area Taping in Outdoor Switchyards

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Industry Safety Steering Committee

Issued December 2010

Revised September 2012

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Original Issue: December 2010

Revision: September 2012

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## PREFACE

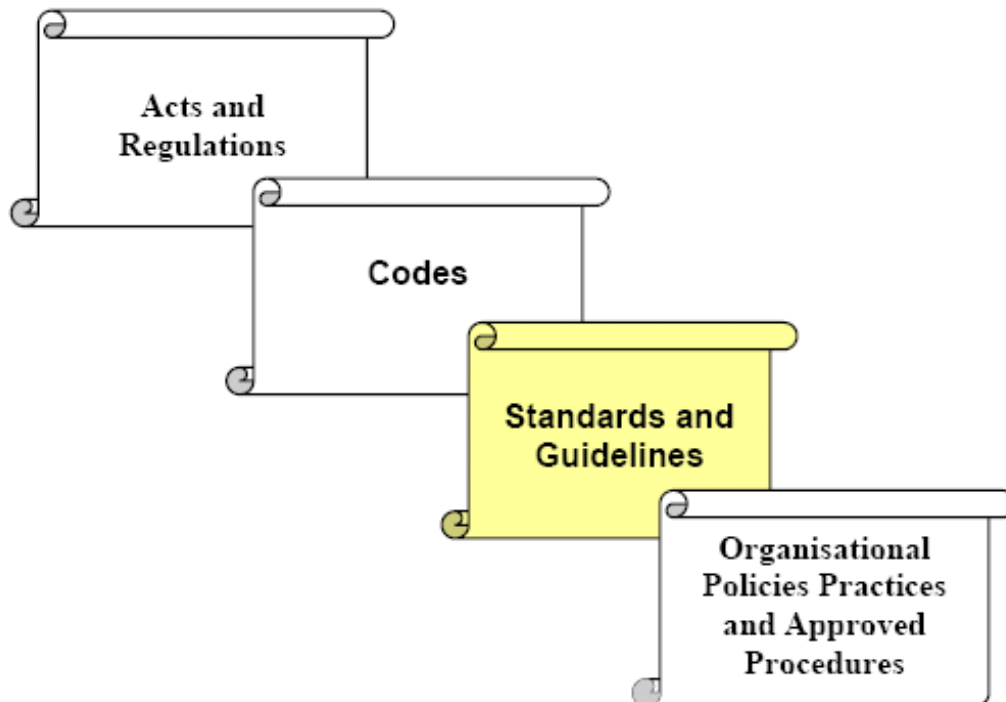
This Guideline was prepared for the NSW Electricity Industry Safety Steering Committee by a committee drawn from the NSW Electricity Supply Industry to assist in the development of Network Operators' Network Management Plans required under the Electricity Supply (Safety & Network Management) Regulation 2008 (The Regulation).

The Guideline was revised by the reconstituted Working Group which included all relevant stakeholders and was subsequently endorsed by the Industry Safety Steering Committee at their September 2012 meeting.

The Guideline's prime purpose is to ensure the safety of electrical workers. It is not intended that it be used to inhibit innovation where it enhances work practices and worker safety.

It is a guide and therefore equipment, tests, inspection or practices other than those in this document may well be perfectly satisfactory. Organisations are at liberty to provide different equipment, to specify different tests, or to inspect equipment in a manner or at intervals assessed as appropriate to particular circumstances, provided always that these alternatives are based on sound design or reasoning and that the outcome of worker safety is not prejudiced.

The following diagram outlines the framework into which this Guideline fits.



Note: The use of italics indicates the word or words are as defined in this Guide.

This Guideline does not substitute for, or override, any legislation or regulation enacted by jurisdictional Regulators or safety rules implemented by Network Operators. The ISSC will monitor the use and impact of this Guideline and, consequently, may review and amend it from time to time.

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# **1 SCOPE**

This document has been developed to provide a uniform set of requirements for installing tape barriers and signage to provide safe work areas for people involved with work under access permit conditions in Outdoor Switchyards.

The NENS 03-2006 National Guideline for Safe Access to Electrical and Mechanical Apparatus specifies yellow tape, rope or alternative to define a safe work area. This ISSC Guideline recommends that high visibility yellow coloured tape is used.

## **1.1 REFERENCED DOCUMENTS**

- ENA NENS 03-2006 National Guidelines for Safe Access to Electrical and Mechanical Apparatus
- WorkSafe Australia – Code of Practice: Managing Electrical Risks in the Workplace

## **1.2 DEFINITIONS**

The term “Access Permit” is interchangeable with “Access Authority” in this document.

# **2 IMPORTANCE OF THESE INSTRUCTIONS**

To ensure Network Operators:

- Meet regulatory requirements;
- Provide a safe place of work; and
- Establish that workers and others know the required actions to be taken when working in and around areas covered by an access permit.

# **3 CHALLENGES**

- ENSURING consistent methods are employed across all Network Operators.
- ENSURING workers and others follow this Safe Work Area guideline.

## 4 PROCEDURES

### 4.1 Climbing of structures within an Access Permit Area

**Climbing of structures** which support high voltage electrical equipment and are in an area that is under access permit conditions inside the substation **is not permitted**.

- To gain access to equipment appropriate ladders, elevated work platforms, dedicated climbing points, scaffolding and work platforms shall be used in these situations.

### 4.2 General Requirements of Tape Barriers

Network Operator approved high visibility stands should be used in switchyards.

Non high voltage structures, such as fences, gates or walls may be used to support barrier tape if safe distances from exposed high voltage are maintained.

Structures such as fences, buildings and blast walls that prevent entry and exit of the safe work area may be used as part of the barrier provided no gaps exist between the structure and the tape.

The Network Operator's approved barrier tape only must be used for defining access permit areas. The tape should be high visibility yellow.

Tape that is damaged, dirty, faded or detracts in any way from its visual impacts shall not be used.

During construction works etc, where hazardous areas are to be identified, appropriate temporary fencing, barriers or an alternative coloured tape, to that used for access permit areas, is to be used.

Safe work area tape barriers must only be erected after the completion of isolation, proving de-energised and the short circuiting and earthing of the equipment.

Safe work area tape barriers must be erected only by an authorised person prior to the issue of an access permit.

Tape barriers shall be erected at a nominal height of 900mm above ground, with sufficient support stands to ensure the tape does not sag below nominal 700mm above ground.

Tape stands are to be highly visible and stable in windy conditions.

No work may commence in an access permit area, until the tape barrier is erected, all members of the work party are made aware of the safe work area and are signed onto the access permit.

Only a person authorised by the Network Operator may move or modify the tape barrier whilst an access permit is current.

Positioning of the barrier shall be arranged so that normal work can be undertaken on the equipment without crossing over or under the tape and safe distances from exposed high voltage are maintained.

A safe work area tape barrier must be removed in accordance with organisational procedure following the cancellation of the access permit.

Whilst the access permit is in force it must be readily available at site and should be located at the entry to the safe work area, see Figure 3.

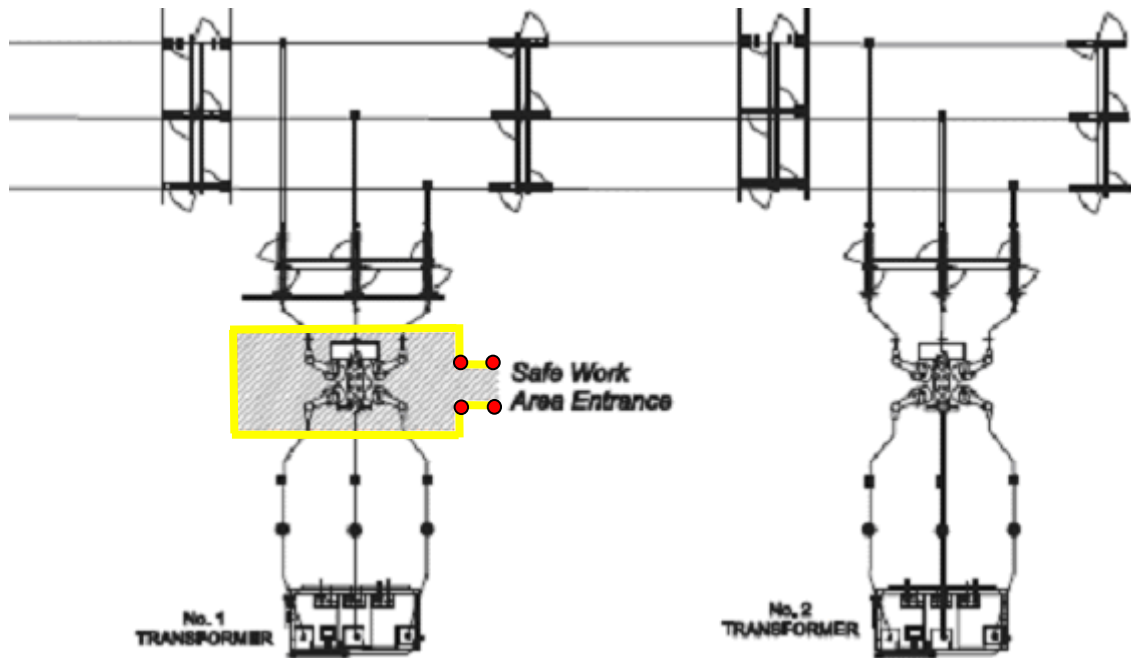
### **4.3 Types of Tape Barriers**

Due to the configuration of equipment within electrical substations two different methods of taping may be employed. They are the Barrier In Method or the Barrier Out Method.

Risk assessment of the work site shall determine the most appropriate method of taping to be used.

### 4.3.1 Barrier in Method

Usually in open switchyards the Barrier In Method is used as it is the most practical method of identifying the equipment to be worked on and establishing a safe work area as shown in Figure 1.



**Figure 1 – Barrier In Method**

A barrier is erected around the equipment under access permit conditions and inside the taped area becomes the safe work area.

When using the barrier in method the area must have a single entrance corridor (with nominal width of 1.5 metre and length of 2-3 metres) which is clearly defined by the use of four (4) high visibility bollards. The high visibility bollards should be a contrasting colour to the tape stands.

As a normal minimum standard and where practical the entry corridor should join the main work area at right angles, see Figure 2, in the centre of one side so as to provide an additional indicator of the defined entry point.

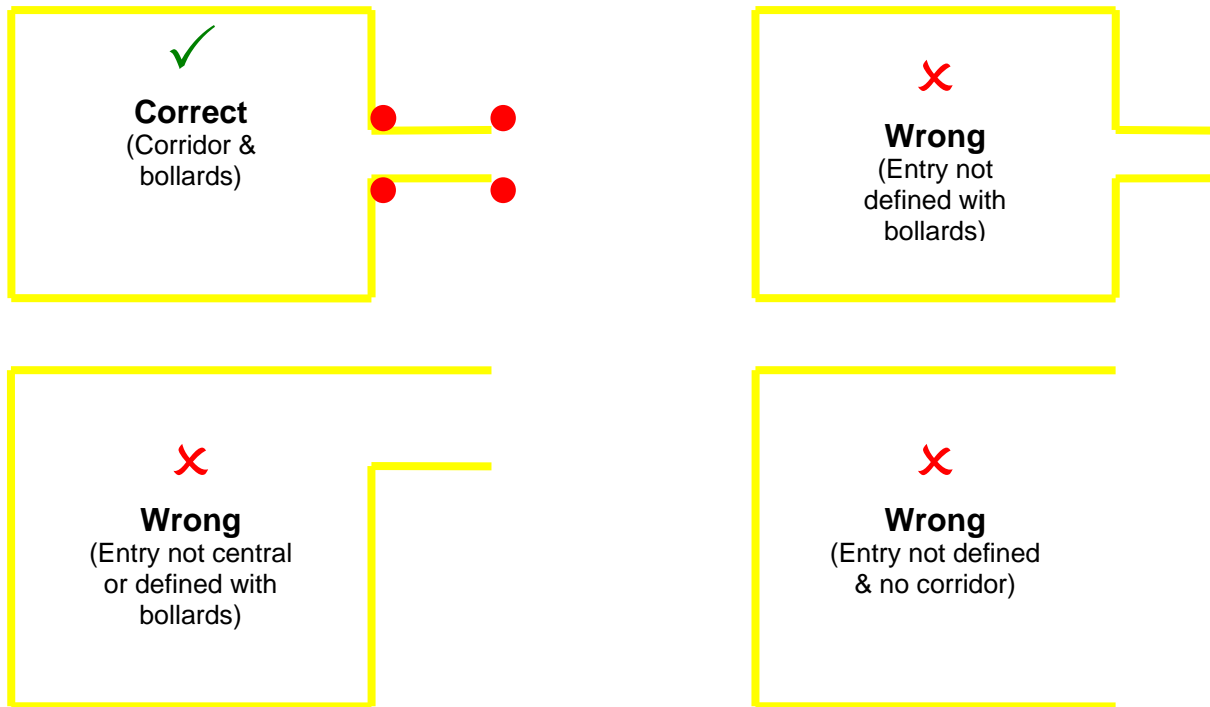


Figure 2 – Defining the Entrance for an Access Permit Area



Figure 3 – Correct Safe Work Area Established for a Circuit Breaker Bay

In a small number of situations the layout of the equipment inside the substation may not allow the entry corridor to be in the centre or achieve a right angle return. In this case the entry must be clearly defined by the use of 4 or more high visibility bollards with all workers and others being made aware of the situation and any hazards during the risk assessment process prior to commencing work as shown in Figures 2 and 3.

Structures that support high voltage electrical equipment must not be used to support tape barriers as shown in Figure 4.



**Figure 4 - Tape is supported by Stands, NOT High Voltage Structures**

Personnel are not permitted to cross an erected tape barrier but must enter and exit by the defined entrance as shown in Figures 2 and 3.

If plant and equipment cannot pass into the safe work area via the defined entry the access permit recipient may temporarily lower the tape provided it is re-established immediately after the crossing and a nominated person is in place as an observer whilst the barrier is lowered.

### 4.3.2 Barrier Out Method

In some situations due to the layout of the equipment within the substation or the type of work to be performed the Barrier Out Method may be used, where all live equipment is fenced out. This is shown in Figure 5.

A tape barrier is erected between the equipment under access permit and all other live equipment in the substation. Other access to the live equipment in the outdoor switchyard is to be taped off also.

Structures that support high voltage electrical equipment should not be used to support tape barriers unless necessitated by spacing and configuration of equipment. Should the tape barrier have to be supported by a structure which supports high voltage equipment, this must be included in special instructions and warnings on the Access Permit.

As the entry is clearly defined by other means and access is prevented to all other live equipment, high visibility bollards are not required at the entrance.

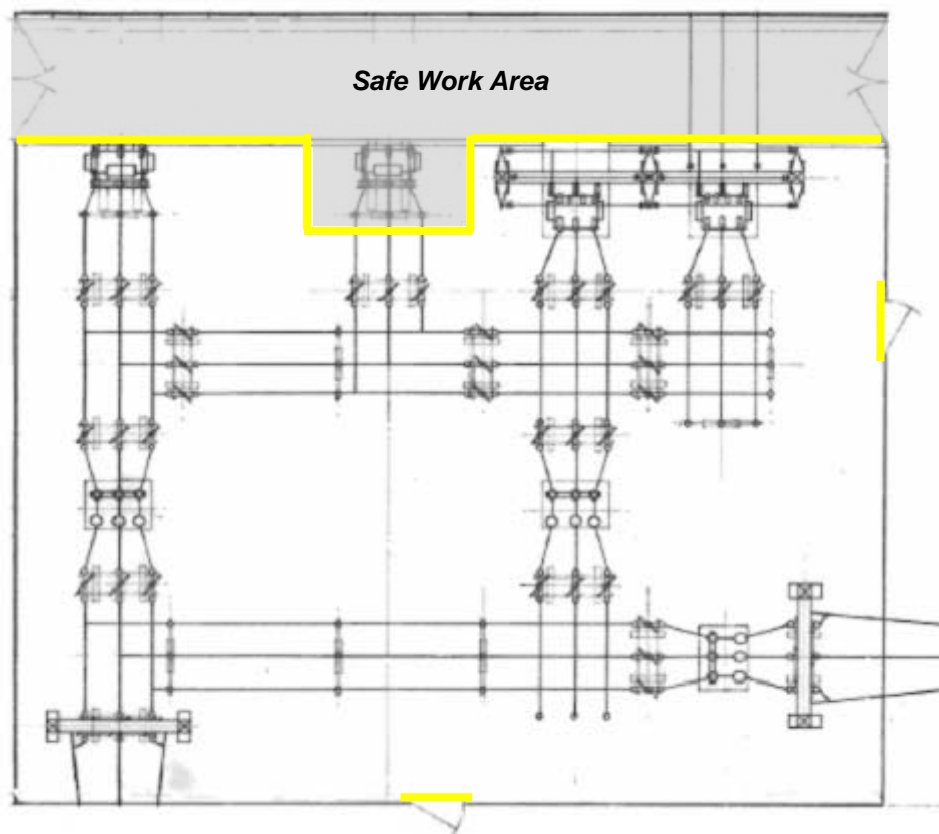


Figure 5 – Barrier Out Method

#### 4.4 Signage

Where live equipment may be present adjacent to or above the taped area a sign should be positioned near the live equipment. The recommended danger sign and an example of its placement is shown in Figures 6 and 7 respectively.



Figure 6 – Recommended Danger Sign



Figure 7 – Example of use of Danger Sign