

ISSC 29
Guideline for
Pre-Climbing
and
Climbing Assessment of Poles

August 2005
Minor Amendment May 2013

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1 Contributions

In the development of this Guideline, discussions were held with the following parties:

Network Operators

Essential Energy
Ausgrid
Endeavour Energy
TransGrid
RailCorp

Other Members

Small Poles (representing NECA and Level 2 Service Providers)

Regulators

Department of Trade & Investment Division of Resources & Energy (DRE)

Unions

Electrical Trades Union of Australia NSW Branch

2 Preface

The Industry Safety Steering Committee was re-established by the NSW Minister for Energy in mid 2002 to:

- 1) Review the safety performance and current practices of the electricity supply industry and IIN's compliance strategies to identify opportunities for improvement.
- 2) Provide advice and make recommendations to the Minister for Energy on ways to convert the identified opportunities into improved safety outcomes for:
 - a) The community,
 - b) Electricity customers,
 - c) Industry employees,
 - d) Industry contractors,
 - e) Accredited Service Providers, and
 - f) Other workers working in the vicinity of electricity network assets.
- 3) Set up working groups where considered necessary to develop advice, document issues and draft Codes and guides for consideration of the ISSC. Working groups are provided with terms of reference and timetables to report back to the ISSC.

At the ISSC Meeting of the 12th December 2002 it was resolved that a working group be formed to prepare a NSW guideline for the pre-climbing and during climbing assessment of poles (ISSC29).

- 4) Minor amendment November 2009 Appendix 3 Private Pole Marking tag size altered.
- 5) Minor amendment May 2013 to update for the new Work Health and Safety legislation, Regulator name changed and sundry other minor corrections.

3 Disclaimer

While due care has been exercised in the compilation of this Guideline, much of the content has been sourced externally to the ISSC and IIN. Thus ISSC cannot accept responsibility for the content.

This Guideline is designed on the basis that it be used in its entirety, and persons who use or observe parts of the publication without paying heed to the entirety of the publication do so at their own risk.

This Guideline has been prepared on the basis that the user will be appropriately trained, qualified, authorised and competent. This Guideline is not intended for use by untrained or unqualified persons, and anyone in that category using the guideline does so at his/her own risk.

This Guideline does not purport to ensure compliance with all relevant statutes and regulations, such as work health and safety laws. Users must satisfy themselves as to the requirements of all relevant laws.

4 Purpose

This guideline has been produced as a reference to assist organisations in the formulation of safe climbing procedures for all personnel *authorised* in New South Wales who have reason to ascend poles used for the transmission and distribution of electricity.

This guideline addresses safety issues associated with the structural integrity of poles to be climbed and provides information and guidance for the development and implementation of pre-climbing and climbing procedures. This guideline also makes recommendations on the training and competency assessment of *employees*.

5 Introduction

This Guideline supports the NSW Electricity Supply Industry in the prevention of occupational injuries and fatalities of persons ascending, working on and descending *electricity poles*, which is consistent with the intentions of the NSW Work Health and Safety Legislation (WHS Regulation and WHS Act) and the National Electricity Network Safety Code (ENA DOC-001 2008).

Safety is enhanced by industry adoption and implementation of uniform safe systems of work, as increasing network contestability results in *network operators' workers* (including contractors) regularly crossing State and network boundaries in the course of their work.

The Guideline is advisory only and does not substitute for, or override any relevant legislation, regulation or safety rules implemented by jurisdictional regulators or *network operators*. However, it may be used as reference material for an industry-based approach to the consistent interpretation and implementation of legislation.

Under the Electricity Supply (Safety and Network Management) Regulation 2008, the Director General of IIN may nominate any industry code or guide to be taken into account in developing Network Management Plans.

This guideline should be read in conjunction with other standards and guides which refer to the specific kind of work concerned. These will contain references to the various items of equipment involved, work practices, testing regimes and safety considerations.

6 Definitions

authorised person means a person who has been authorised in writing by the Network Operator to work on or near their network.

competent means having been assessed as having the skills, knowledge and attributes required to perform a specific task.

critical axis means the area of the pole where the net load is maximised.

database is the network operators historical record of the individual *pole*.

electricity network means transmission and distribution systems consisting of electrical apparatus which are used to convey or control the conveyance of electricity between the generator's points of connection and customers' points of connection.

worker means a person who carries out work in any capacity for a PCBU, and includes employees, contractors and sub contractors.

person conducting a business or undertaking (PCBU) may be an individual person (eg sole trader), or an organisation that engages workers to undertake work for them (eg network operator),

network operator means the owner, controller or operator of an *electricity network*.

non-critical axis is the area of the pole where the net load is minimised.

pole means the timber, concrete or steel structure which supports the electricity network excluding towers.

private pole a *pole* (generally timber) that is of a similar type and size to that used by the electricity network. These poles should be treated in a different manner as they may not have been subjected to a specific routine inspection and maintenance regime.

private post or point of attachment a timber or steel structure on private property as per AS/NZS 3000 requirements. These are generally shorter and of smaller dimension than a private pole.

qualified pole inspector means a worker who holds a current qualified pole inspectors certificate issued by a recognised body.

street light column means a tubular steel, concrete or other structure that is used primarily to support a street lighting luminaire.

7 Risk Management

Under the WHS Regulation all *PCBUs* (including self-employed persons) must use a "risk management" approach to address workplace health and safety. Risk management should be initiated when considering new work, purchasing equipment, developing or changing work systems, or designing or re-modelling the workplace. This will help identify the special needs of each workplace.

The WHS Regulation requires *PCBUs* to:

- Identify hazards;
- Assess the risks to the health and safety of persons arising from the hazards, where the risk and possible controls are not already known; Eliminate risks, or where this is not reasonably practicable, use appropriate controls to minimise risks; and
- Monitor and review control measures to ensure on-going effectiveness.

These are the key elements of a risk management process which should be undertaken in consultation with the people most likely to be affected, such as workers and other *PCBUs*. When doing this, it may help to break the workplace or work activities into areas and deal with each separately.



8 Pre Climbing Checks

If at any time during the inspection/ assessment process defects are identified that compromise the integrity of the *pole* the *pole* is not to be climbed unsupported and no further tests are required. The *pole* condition should be reported immediately.

8.1 Is the pole safe to approach?

All *poles* including *private poles* should be inspected to ensure that they are safe to approach. Points to look at are:

8.1.1 Conductors

- Low/damaged conductors;
- Uneven sag or inappropriately designed attachments;
- Lightning, burn or flash marks;
- Integrity of insulators; and
- Visual signs of leakage currents.

8.1.2 Pole Structure Soundness

- Termites and termite treatment;
- Condemned, reinforced and strutted poles;
- Visual evidence of decay;
- Differences in *pole* situation i.e. leaning, bending, tight/ slack stays or conductors;
- Depth and age of pole;
- Structural damage including impact by motor vehicle;
- Lightning, burn or flash marks;
- Rusting, spalling, discolouration (concrete and steel);
- Visual signs of leakage currents;
- Unsupported or supported poles that may become unsupported;
- Missing/ loose hardware *pole* caps etc.
- *Pole* step(s) missing;
- *Pole* foundation condition (including concrete works at ground line); and
- Deformed concrete/ steel poles.

8.1.3 Physical Terrain

- Existing traffic conditions, pedestrian/vehicular;
- Changes in the traffic conditions due to work to be carried out;
- Sloping or uneven ground which will affect *pole* stability during work; and
- Recent excavations at pole base.

8.1.4 Electrical Hazard

- A risk assessment should be carried out to determine if, as part of a safe to approach procedure, an electrical leakage test is required, in particular on high voltage poles.

Storms and/or adverse weather or special circumstances: *Workers* should always be aware of the hazards and higher exposure and risks associated with storm conditions or fault finding situations.

8.2 Notation of pre-existing condition of the pole

Check for condition identification markers, i.e. condemned markings, crosses, rings, discs as per section 12 of this guideline. Check *pole* identification disc for in ground depth indication.

***Private poles* (may or may not be marked as such) should be treated with extreme care as they may not have been subjected to a regular maintenance and inspection regime.**

If deemed necessary a check could be made on the Network Operators *database* for indication of the condition of the *pole* and when it was last inspected. This check could be done during the planning phase of the work.

8.3 Detailed Inspection

The detailed visual inspection must take into account but not be limited to the following:

8.3.1 Above Ground Visual Inspection

Timber Pole

- Splits;
- Knots and checks;
- Evidence of termites;
- Fungal decay and fungal fruiting bodies
- Degradation;
- Vehicular impacts;
- Fire damage; and
- Leaning or bending.

Concrete and Steel Poles

- Rusting;
- Spalling;
- Discolouration;
- Vehicular impacts;
- Fire damage; and
- Leaning or bending.

8.3.2 Sounding (Timber Poles Only)

Sounding is a recognised industry method to assist in the determination of the *pole* condition. Sounding is performed as follows:

Strike the *pole* from several directions with an appropriately weighted ball pein hammer or equivalent implement. Starting at the base of the pole, as close as possible to ground-line and starting in the *non critical axis*, sound around the circumference, at approximately 100mm intervals, then progressively upwards around the circumference of the pole, as high as can be conveniently reached whilst listening for changes in the sound the implement makes on contact with the pole.

8.3.3 Below Ground (Optional)

In situations where the pole top load will be significantly affected by the works being undertaken or where the condition of the pole is suspect as a result of the inspections carried out in accordance with Sections 8.3.1 and 8.3.2, workers should refer to the following below ground inspection guideline.

Timber only

- Look for evidence of ground movement in the vicinity of the *pole* butt;
- Excavation – excavate a slot to 350mm in the *non critical axis*;
- Look for external *pole* decay or rot;
- Check for decay with a spud bar or similar implement by striking the *pole* (this may compromise the *pole* preservative maintenance treatment);
- Check for concrete collar;
- Compare diameters of original and degraded sections of the *pole* (safety factor example shown in Appendix 1); and
- Drilling assessment of pole strength using pole inspection guidelines to determine the condition of the pole through an internal evaluation can only be performed by *qualified pole inspectors*.

Concrete and Steel Poles

- Look for evidence of ground movement in the vicinity of the *pole* butt; and
- Excavation – excavate the full circumference of the *pole* to approximately 100mm. Look for signs of rust, spalling, discolouration.

8.3.4 Rope Test (Optional)

Rope test – Pressure is applied as close as possible to the head of the *pole* by the attachment of a rope which has been hoisted by an approved operating stick or a ladder to the top of the pole. Pulling is to be done by hand only and is to be in the same direction as the *critical axis*.

Note: Ensure the rope used is of a sufficient length that should the *pole under* test fail, the person conducting the test, other persons and structures will not be struck by the pole or conductors.

Other persons and motor traffic must be kept well clear during the test.

9 Checks Whilst Climbing the Pole

The following further items may assist in determining if the *pole* is suspect after checks in Section 8 have been completed:

- Noise;
- Detailed visual inspection for, splits, knots, termites and degradation;
- Sounding whilst ascending where practicable (Timber);
- Excessive bending of *pole* or ladder movement;
- Excessive vibration;
- Loose *pole* steps; and
- *Pole* footing movement

10 Continual Monitoring of the Pole

Personnel working at the *pole* top should be aware that the load conditions at the *pole* top are constantly changing due to a number of factors eg. wind. Therefore the following points should be monitored, and acted upon if appropriate:

- Noise, eg creaking, breaking;
- Excessive movement of pole, ladder;
- Excessive vibration;
- *Pole* footing movement;
- Weather changes; and
- Changed traffic conditions.

If significant load changes are to occur then the pole must be supported.

11 Training and Competency Assessment

11.1 Training

All workers who are required to climb poles shall be trained in the nature of the work, including the use of any equipment or procedures required. A record of training should be kept by the PCBU.

11.2 Annual Competency Assessments

PCBUs must ensure workers undergo assessment in appropriate aspects of pre-climbing at intervals not exceeding 12 months. Should *workers* not reach the competency standards required then *they* must not permit the *employee* to ascend poles without retraining.

PCBUs must keep suitable and accurate records that indicate *workers* have displayed competence in the appropriate procedures within the previous 12 months.

11.3 Authorisation by Network Operator

The *Network Operator* must ensure all persons working on or near their *electricity network* are *authorised*. The authorised person must have received training and are currently assessed as competent in Pre-climbing and Climbing procedures acceptable to that *Network Operator*.

12 Marking of Poles

The recommendations for the standardisation of pole markings are listed below, additional details can be found in the appendices:

- Suspect Poles – A single highly visible orange band around the pole as indicated in Appendix 4;
- Condemned Poles – Permanently marked “X” plus a single highly visible orange band as indicated in Appendix 4;
- Termite Treated Poles – A tag with removable sections indicating the date(s) of treatment or follow-up inspection, and ending with a permanent T tag as indicated in Appendix 2;
- Private Poles – These are to be marked as indicated in Appendix 3; and
- Localised markings can be determined by individual network operators for special circumstances.

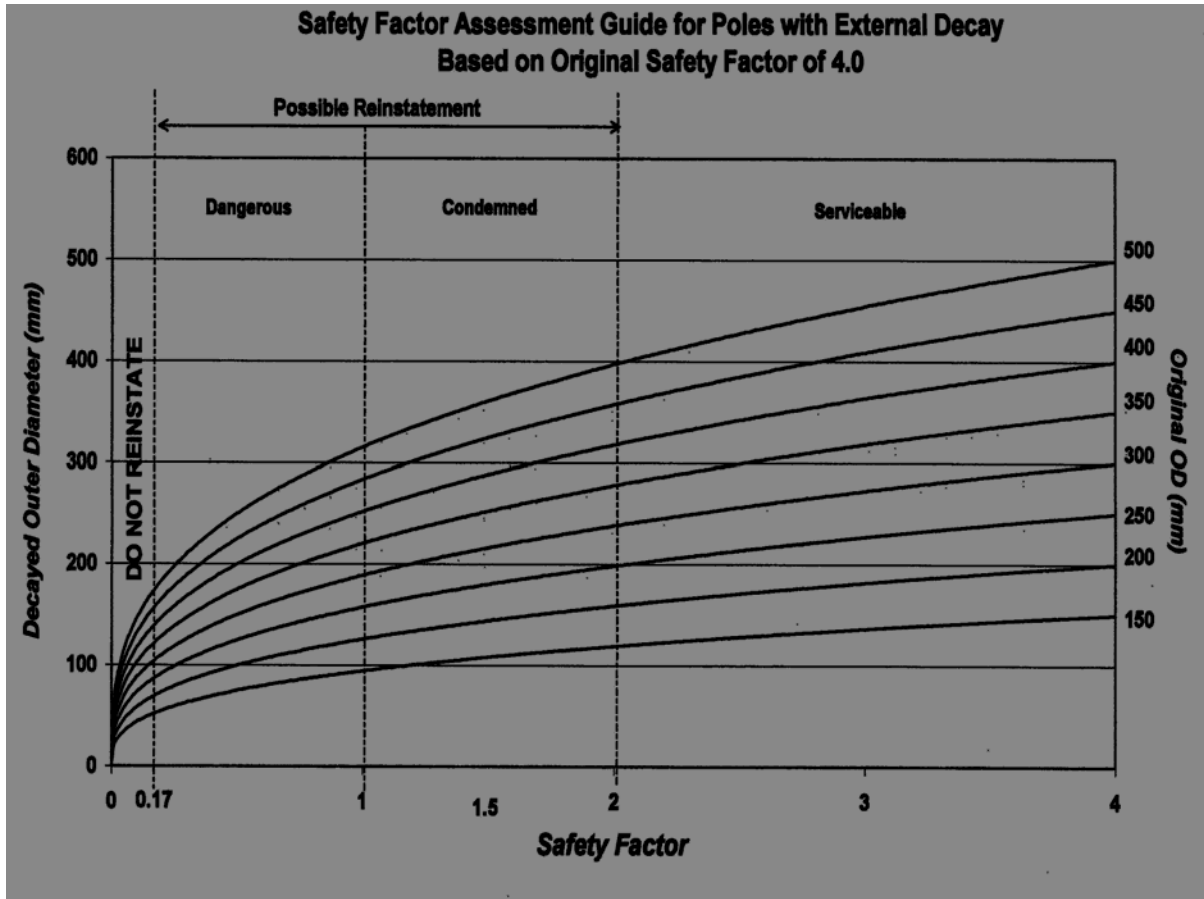
Note – Suspect poles that are suitable for reinforcement (e.g. nailing, staying) can be marked with the visible orange band that may then be removed after reinforcement has taken place.

13 References

- AS/NZS 3000 – 2007 SAA Wiring Rules;
- AS/ NZS ISO 31000: 2009 Risk Management – Principles and Guidelines;
- Code of Practice – Working on or near, exposed live electrical equipment in NSW;
- *Work Health and Safety Regulation 2011*, NSW; and
- EA 18 Guide to the Training of Electricity Supply Workers

14 Appendices

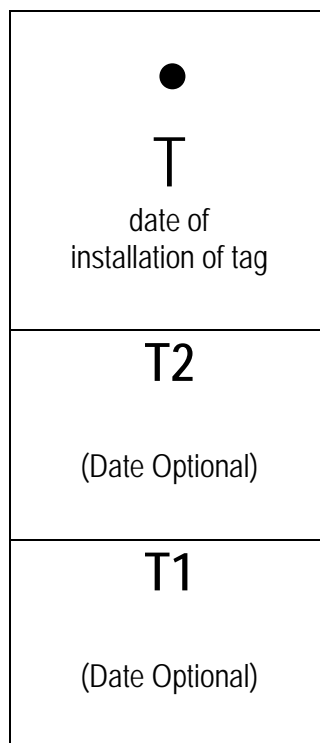
Appendix 1 Safety Factor Assessment for Poles with External Decay (Example Only)



Appendix 2 Termite Treatment Pole Example Tag (Not to Scale)

Poles must be permanently marked with a three stage (perforated) tag indicating a number of termite treatments/inspections and ending with a permanent "T" tag. Dates may be etched into the tag.

This tag is to be installed below any tape markings on the non traffic area of the pole in urban areas at least 2m above GL, otherwise in the same axis as the pole ID disc.



The lowest section of the tag (T1) indicates the initial treatment of termites in the pole.

The centre section of the tag (T2) indicates the follow-up inspection and/or treatment of the pole. The upper section of the tag indicates that termites have been identified in this pole.

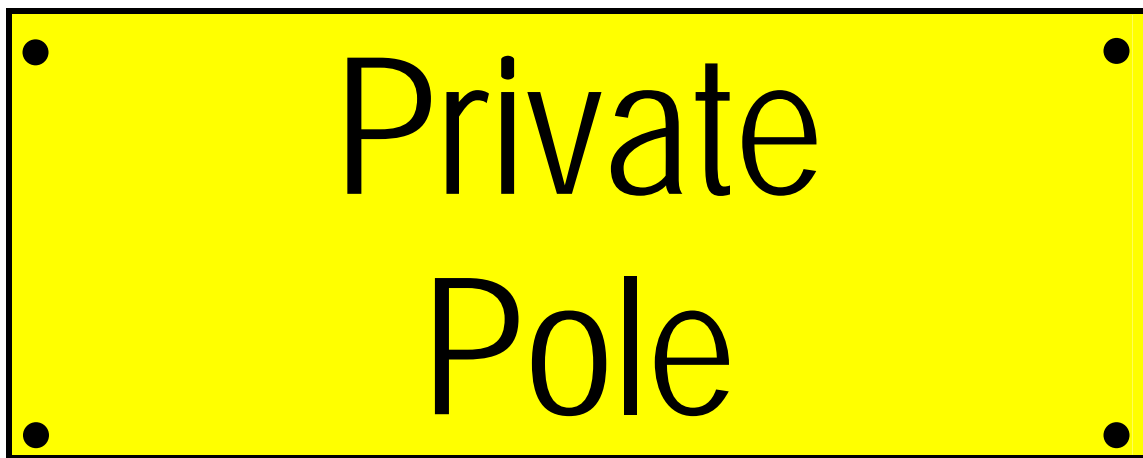
This tag may be designed such that the lower sections of the tag may be removed, in accordance with the procedures of the respective network operator. The top most section of the tag should be permanent for the life of the pole.

Appendix 3 Private Pole Marking (Not to Scale)

Private poles need to be identified and marked with an appropriate tag as illustrated below.

“Private Pole” must be printed in black on yellow minimum of 100mm x 75mm wide, installed at least 2m above GL on the approach side of the pole below any other markings.

The condemned pole marking(s) on private poles should be consistent with pole marking of network poles, but should not damage the private pole (eg ‘X’ may be painted on).



Appendix 4 Sample Pole Band and Permanent "X" on a Condemned Pole (Not to Scale)

A suspect pole will be marked by a single band of at least 75mm wide reflective orange self adhesive tape at least 2.4m above ground but below 3m, encircling the whole pole, optionally marked with Black 'X X X's and the organisation's name.

A condemned pole must be permanently marked by an 'X' (cut or painted) into the pole. The "X" must be at least 200mm high and of a significant depth to ensure permanency and be installed below the tape described above.

