ENA LLM 01-2006

GUIDELINES FOR LIVE LINE BAREHAND WORK





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This Guideline is identical to the publication previously issued by the Electricity Supply Association of Australia (ESAA) as HB ESAA LLM 01—2000 and has been redesignated and reissued by Energy Networks Association (ENA) as ENA LLM 01—2006.

The Association (ESAA) has prepared a four-volume set of guidelines for live line work covering:

- (a) Stick methods
- (b) Glove and barrier methods
- (c) Barehand methods
- (d) Helicopter methods

This Guideline sets out broad principles of safety for live line barehand work, with provision for more specific requirements to be documented by the relevant **Asset Managers/Service Providers** to meet statutory requirements and their work requirements.

This document has been prepared for guidance purposes only by a Live Line Work Methods Project Team made up of:

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This Guideline is the second issue of the **live line barehand method** Guidelines and was developed by the project team. Members of the project team were able to draw on the expertise and experience of the participating **Asset Managers** and **Service Providers** as well as the practices of other Australian and overseas Authorities and equipment manufacturers.

Members of the Electricity Supply Association of Australia Limited (ESAA) are not bound in any way to accept the contents for inclusion in their work practices or procedures. Nor does the ESAA or any of its members accept legal responsibility for the contents of this document. It is acknowledged that different practices from those described may be equally satisfactory and safe.

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Energy Networks Association Guidelines for live line barehand work

1 SCOPE

This Guideline sets out the minimum industry standards for **live line barehand work**. The principles may be enhanced or supplemented, provided this does not result in reduced safety standards.

This Guideline applies to all work performed on live **high-voltage** overhead lines where **live line barehand methods** are used.

This Guideline does not constitute a live line training manual, nor does it set down **live line work procedures**. These **procedures** should be developed in accordance with the principles in this Guideline.

The objectives of this Guideline are:

- (a) To ensure the safety of electrical workers and the general public.
- (b) To specify the minimum standards for equipment required for the barehand method.

Live line equipment not specifically designed for live line barehand work shall meet the requirements of the respective ESAA or ENA Guideline, relevant Standards or statutory regulations.

Throughout this Guideline:

- (i) The word 'shall' is to be interpreted as mandatory and 'should' as advisory or discretionary.
- (ii) Reference to lineworker unless specifically notified shall refer to a certificated live line lineworker.

While the principles of barehand work contained in this Guideline have been written around work on overhead lines, the concepts may be equally applicable to work in other areas such as substation equipment, when combined with appropriate training and work controls.

This Guideline does not substitute or override any other Regulation or legislation.

2 CONCEPTS

Live line barehand work is carried out on **energised high-** and extra **high-voltage** lines, with the lineworkers normally wearing conductive clothing. The lineworker is in contact with the **energised** line whilst insulated from earth and other electrical potentials.

The live line barehand method is based on the principle that a lineworker can safely be in contact with an **energised** line, provided that the lineworker is insulated from any other object at a different potential.

The application of this principle requires the use of:

- (a) Electrically insulating equipment for a lineworker to gain access to the **energised** conductor or fitting while maintaining adequate air clearance as insulation from other objects at different electrical potential.
- (b) Conductive clothing to provide the benefits to the lineworker of Faraday's discovery in the 19th century that no electrostatic field exists inside an energised metal cage.

Access to the work can be by way of insulating ladder or rope, insulating elevating work platform, crane or helicopter.

The work can include inspections and repairs to conductors and/or fittings and the replacement of insulators.

3 DEFINITIONS

3.1 Definitions common to all guidelines

3.1.1 Asset Manager

An organisation responsible and accountable for the equipment to be worked on. An Asset Manager may also be a Service Provider.

3.1.2 De-energised

Disconnected from all sources of supply but not necessarily isolated, tested and earthed.

3.1.3 Earthed

Isolated and electrically connected to the general mass of earth.

3.1.4 High-voltage

Voltage exceeding 1000V

3.1.5 *Insulating elevating work platform (insulating EWP)*

An approved and **tested** insulated aerial device.

3.1.6 *Insulating rope*

Rope, which is intentionally placed across phase to phase or phase to earth air gaps, and which is specially designed, manufactured, **tested** and maintained so as to have very high insulating qualities.

3.1.7 *Live (or alive or engergised)*

Connected to a source of electrical supply.

3.1.8 Live line equipment

All live line tools, rope, gloves and insulating equipment used for live line work.

3.1.9 *Live line minimum approach distance (live line MAD)*

The minimum air gap that shall be maintained between a lineworker and any other component at different potential during **live line work**, in order to prevent flashover and provide for worker safety.

3.1.10 *Live line permit*

A permit, issued by the system controller, to verify to a **live line work** party the control measures in place on the circuit being worked on, and to authorise work.

3.1.11 *Live line rope*

Standard commercial grade synthetic rope, which is not intentionally placed across phase to phase or phase to earth air gaps, but which is known to have good insulating properties.

3.1.12 Live line stick (also called Hot Stick)

A solid or filled stick of insulating material specially designed, approved and **tested** for use in physically bridging the distance between the lineworker and **energised** components, between the **energised** components and earth, between adjacent phases, or to enable physical loads to be taken or tools to be applied.



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