

# Electrical Work Standard

AGL-HSE-STD-007.1

The scope of this standard applies to all electrical activities carried out on AGL controlled sites and carried out by AGL employees, non-AGL controlled sites and equipment.

The reference numbers given to minimum controls provide a direct linkage between this standard and the Risk and Control Matrix. The Electrical Work Methodology AGL-HSE-SDM-007.1 provides further explanation of how to achieve the minimum controls.

*The underlined minimum controls below have been identified as being critical controls.*

| STD Ref No.   | Minimum Controls  |
|---|---|
| <b>Electrical Work Processes</b>                      |   |
| <u>7.1.1.1</u>  | <u>For all electrical work a risk assessment must be completed prior to the work being undertaken, with consideration to induction, arc flash and requirements to isolate.</u>  |
| <u>7.1.1.2</u>  | <u>Test for dead (test before touch) procedures must be applied at all times.</u>   |
| 7.1.1.3   | No work is to be carried out on energised electrical conductors without a: <ul style="list-style-type: none"> <li>• Work Order;</li> <li>• SOP/Procedure and/or Work Instruction;</li> <li>• SWMS/JSEA;</li> <li>• Competent Work Group;</li> <li>• Appropriate Plant Access; and</li> <li>• Relevant tasks specific Certificates/Plans/Checklist.</li> </ul> |
| 7.1.1.4   | All electrical work must be certified as required by the relevant legislation.  |
| <b>Electrical Permitting</b>                          |   |
| 7.1.1.5   | An appropriate safe access system must be applied before any work is undertaken on or near electrical apparatus' (which may be a permit).   |
| <b>Electrical Isolation</b>                           |   |
| 7.1.1.6   | An isolation process must be established using an AGL approved system which includes locks, tags, and/or a physical control mechanism to secure the isolation and prevent unplanned re-energisation (where practicable).  |
| <b>High Voltage</b>                                   |   |
| 7.1.1.7   | A High Voltage Permit or Access Authority must be completed prior to commencing any high voltage work activities.   |
| <b>Awareness of Energised Electrical Work Hazards</b> |   |

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| 7.1.1.8  | At all AGL operations when working on or near energised electrical equipment, the tools and equipment used must be non-conductive or insulated.  |
| <b>Fault Finding and Testing</b>                   |  |
| 7.1.1.9  | Fault finding and testing on energised electrical equipment must be carried out by an appropriately competent or authorised person.  |
| <b>Working Near Energised Electrical Equipment</b> |  |
| 7.1.1.10   | When working on or near energised electrical apparatus a risk assessment must be completed in accordance with AGL HSE Risk Management Standard (AGL-HSE-STD-004.1).  |
| <u>7.1.1.11</u>                                    | <p><u>An exclusion zone must be applied when working in the vicinity of:</u></p> <ul style="list-style-type: none"> <li>• <u>A bare overhead power line;</u></li> <li>• <u>An insulated overhead power line connected to a building;</u></li> <li>• <u>An open switchboard with exposed components (e.g. connections or bare busbars);</u></li> <li>• <u>An exposed overhead conductor (e.g. substation busbar, travelling or gantry crane busbars);</u></li> <li>• <u>and</u></li> <li>• <u>Any exposed electrical part which may present risk to personnel.</u></li> </ul>   |
| <b>Access Levels for Electrical Work</b>           |  |
| 7.1.1.12   | Access to electrical panels, substations and high voltage areas must be secured to prevent unauthorised access.  |
| <b>Authorisations for Electrical Work</b>          |  |
| <u>7.1.1.13</u>                                    | <u>All electrical work is to be undertaken by suitably competent and (where applicable) licensed personnel.</u>  |
| <b>Ladders, scaffolds and similar equipment</b>    |  |
| 7.1.1.14   | On AGL controlled sites metallic, wire reinforced or otherwise conductive ladders must not be used where there is any electrical potential.  |
| <b>Personal Protective Equipment</b>               |  |
| <u>7.1.1.15</u>                                    | <p><u>All PPE used must comply with any relevant Australian Standards. Depending on the type of work and the risks involved, the following PPE must be considered:</u></p> <ul style="list-style-type: none"> <li>• <u>Face Protection—use of a suitably arc rated full face shield may be appropriate when working where there is potential for an arc flash to occur;</u></li> <li>• <u>Eye Protection—metal spectacle frames must not be worn;</u></li> <li>• <u>Gloves—use gloves insulated to the highest potential voltage expected for the work being undertaken. Leather work gloves may be considered for de-energised electrical work;</u></li> <li>• <u>Clothing—use non-synthetic clothing of non-fusible material and flame resistant. Clothing made from conductive material or containing metal threads must not be worn; and</u></li> <li>• <u>Footwear—use non-conductive footwear (e.g. steel toe capped boots or shoes manufactured to a suitable standard).</u></li> </ul> |

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| 7.1.1.16   | <u>Gloves must be used when operating metal clad switchgear and earthing High Voltage apparatus.</u>  |
| 7.1.1.17   | <u>Low Voltage Gloves must be used when exposed conductive parts have not been confirmed as isolated, proven de-energised and where practicable earthed. Low Voltage gloves must also be used when working in and around live apparatus</u>   |
| <b>Tapes and other measuring devices</b>           |   |
| 7.1.1.18   | Only non-conducting tapes and rulers must be used in the vicinity of energised electrical equipment.  |
| <b>Portable Equipment – Inspection and Testing</b> |   |
| 7.1.1.19   | All electrical portable appliances and tools must have inspection and testing requirements determined and actioned in accordance with any relevant Australian Standards.  |
| 7.1.1.20   | Inspection and testing of electrical equipment must be carried out by a competent person who has acquired, through training, qualification and/or experience, the knowledge, and skills to carry out the task.  |
| <b>Residual Current Devices</b>                    |   |
| 7.1.1.21   | RCD's must be used at AGL controlled sites in accordance with the relevant Australian Standard.   |
| <b>Managing Energised Electrical Work</b>          |   |
| 7.1.1.22   | Electrical work must not be carried out on energised electrical equipment unless: <ul style="list-style-type: none"> <li>• It is necessary in the interests of health and safety that the electrical work is carried out on the equipment while the equipment is energised;</li> <li>• It may be necessary that life-saving equipment remain energised and operating while electrical work is carried out on the equipment;</li> <li>• It is necessary that the electrical equipment to be worked on is energised in order for the work to be carried out properly;</li> <li>• It is necessary for the purposes of testing; or</li> <li>• There is no reasonable alternative means of carrying out the work.</li> </ul> |
| 7.1.1.23   | The justification for working on energised electrical equipment must be documented.   |
| <b>Managing Arc Flash</b>                          |   |
| 7.1.1.24   | A documented system for managing arc flash must be in place for all Business Units.   |
| 7.1.1.25   | All work activities involving exposure to arc flash are to be undertaken by suitably competent and authorised personnel.  |
| 7.1.1.26   | Each item of plant or area on AGL controlled sites where there is a risk of arc flash must show a visible label containing: <ul style="list-style-type: none"> <li>• Electrical arc sign;</li> <li>• Level of PPE required; and</li> <li>• Numeric reference to the Arc Flash Register.</li> </ul>  |

| Version | Reviewed by         | Approved by             | Date approved | Next Review |
|---------|---------------------|-------------------------|---------------|-------------|
| 7.0     | HSE Systems Manager | General Manager,<br>HSE | 30/04/2021    | 01/02/2024  |