

Group Standard

C2 – Electrical safety

Group standard	Title: Electrical safety			
	Function: Health, Safety, Environment and Communities (HSEC)			
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Owner: Global head of Health, Safety, Environment and Communities		Approver: Executive Committee		Target Audience: All Rio Tinto staff and each Rio Tinto Group business and function
Direct Linkages to other relevant Policies, Standards, Procedures or Guidance notes: Rio Tinto Management System Standard, C1 – Isolation standard, C2 – Electrical safety guidance note				
Document purpose: To support implementation of the Group Safety policy. It defines the minimum requirements for preventing injuries and fatalities from exposure to electrical hazards.				

C2 – Electrical safety

Intent and scope

This standard applies to employees and contractors working at all Rio Tinto business units and managed operations, through all stages of their lifecycle from exploration through to closure.

This standard applies to all electrical work above 110 volts DC or 50 volts AC.

The intent is to prevent electrical fatality or injury due to:

- arc flash exposure,
- electric shock by direct contact with energised electrical conductors, and
- electric shock by indirect contact due to normally earthed conductive parts becoming live under fault conditions.

Electrical work must be conducted in accordance with governing regulations, codes, design criteria and procedures.

Managed housing and community infrastructure is outside the scope of this standard, the business unit must establish procedures to manage this risk.

Control requirements

Requirements in this standard apply in addition to any defined in the Rio Tinto Management System. At all times, the elimination of risk is the priority.

Planning

- 1.1. There must be a process for ensuring that new or modified equipment and infrastructure takes into account methods to minimise the electrical hazards of arc flash and electrical shock.
- 1.2. There must be an arc flash and shock protection plan to determine and reduce incident energies and to define the appropriate PPE and associated procedures to mitigate the hazard.
- 1.3. Overload protection must be installed on all final distribution circuits. The protection settings must be established by qualified personnel.
- 1.4. Where no code or regulation exists, earth leakage protection must be installed on all final sub-circuits supplying socket outlets. The protection settings must be established by qualified personnel.
- 1.5. There must be task and equipment-specific competency standards and procedures for all electrical work.

Implementation and operation

Competency

- 1.6. Personnel performing electrical work must be deemed competent and authorised against specific competency standards and procedures at intervals not exceeding two years.
- 1.7. Personnel must receive electrical hazard training relevant to their risk of exposure at the commencement of employment and at intervals not exceeding two years.

Electrical equipment

- 1.8. Electrical equipment, grounding continuity and electrical safety devices must be inspected and/or tested upon installation, repair or modification and thereafter on a defined schedule and the findings recorded.
- 1.9. There must be a process for removing electrical equipment unfit or unsafe for purpose.
- 1.10 There must be a process for maintaining up-to-date documentation for:
- single line diagrams,
 - system fault levels,
 - arc flash incident energy levels,
 - equipment details,
 - electrical protection discrimination curves, and
 - cable ratings.
- 1.11 There must be a process to:
- a) minimise active bridges and forces,
 - b) authorise, record and manage bridging, parameter, and code changes for electrical devices.

Isolation

- 1.12 There must be a process to minimise work on live/unisolated equipment.
- 1.13 Where there is a requirement to conduct voltage testing/fault finding, voltage rated gloves and insulated hand tools must be used.
- 1.14 Where there is a requirement to work on live/unisolated electrical equipment, or where there is a potential to make inadvertent contact with energised parts:
- a) there must be an authorised energised electrical work permit (with the exception of voltage testing/fault finding),
 - b) voltage rated gloves and insulated hand tools must be used, and
 - c) the risk of arc flash must be controlled.

Access

- 1.15 Electrical equipment must be appropriately guarded, labelled, and exposed energised parts made inaccessible to unauthorised personnel through the requirement of a key or tool, except for emergency shut off mechanisms.
- 1.16 Electrical equipment accessible to the general public, substations, switchyards and switch rooms/MCC rooms dedicated to power control centres are controlled areas and must be locked with the access controlled.

- 1.17 Access to exposed energised parts in excess of 1,000 volts is prohibited, except for isolation, inspection or testing by competent and authorised personnel where appropriate high voltage equipment, procedures and PPE are used.
- 1.18 There must be a process to protect from damage and mitigate the hazards associated with approaching and working in close proximity to overhead power lines, buried, concealed, surface mounted and trailing cables.

Special installations

- 1.19 There must be a process for managing the electrical contact and arc flash hazards associated with work around electrolytic cells and potlines. Sections 1.14, 1.15 and 1.17 do not apply to electrolytic cells and potlines.