



Government of **Western Australia**
Department of Mines, Industry Regulation and Safety
Resources Safety

Electrical safety audit – guide

August 2017

1 Adelaide Terrace, East Perth WA 6004
Postal address: Mineral House, 100 Plain Street, East Perth WA 6004
Telephone: (08) 9358 8002
ResourcesSafety@dmirs.wa.gov.au
www.dmirs.wa.gov.au

Table of contents

- Introduction 2
- 1 Appointment of electrical supervisors 3
- 2 Electrical workers licences..... 5
- 3 In-house electrical installing work and licence 7
- 4 Appointment of high-voltage operators 9
- 5 Electrical log books 11
- 6 Electrical accidents and incidents..... 13
- 7 Electrical plans and records..... 15
- 8 Supervision of electrical work..... 17
- 9 High-voltage access permit procedure 19
- 10 Powerline corridor access permit procedure 23
- 11 Ground excavation permit procedure 27
- 12 Trailing cable operating procedures 30
- 13 Statutory electrical maintenance 32

Introduction

This audit was reviewed in July 2017 which resulted in minor updates to some terminology and references used throughout the audit. This audit was previously updated in November 2015.

Note: The Safety Regulation System (SRS) has replaced the AXTAT system and all reporting is done online through SRS.

This electrical safety audit is designed to cover compliance with *the Mines Safety and Inspection Act 1994* and the Mines Safety and Inspection Regulations 1995. It also relates to Electricity (Licensing) Regulations 1991 where applicable. The standards relate to the management of statutory and other appointments, systems of work to reduce risk and the recording of required electrical information.

Where the term “verify” is used in the guideline intent, it implies there is a regulatory requirement for compliance with the standard. Where the term “ensure” is used, there is no mandatory requirement for compliance but the standard sets out a recommended practice, which, if followed, should minimise the risk of incidents.

Mines Safety and Inspection Regulations 1995 regulation 5.3 requires that all electrical installations and equipment comply with Australian Standard AS/NZS 3000. AS/NZS 3000 Table A1 references other mandatory Australian Standards and Table A2 references other Australian Standards for information or guidelines.

AS 3012 Electrical installations – Construction and demolition sites also applies to any construction or de-construction activities carried out on mine sites.

List of abbreviations

AS/NZS	Australian and New Zealand Standard
c.	Clause within the Australian and New Zealand Standard
DMIRS	Department of Mines, Industry Regulation and Safety
ELR	Electricity (Licensing) Regulations 1991
MSIA	Mines Safety and Inspection Act 1994
MSIR	Mines Safety and Inspection Regulations 1995
r.	Regulation (of the MSIR)
rr.	Regulations (of the MSIR)
s.	Section (of the MSIA)
SRS	Safety Regulation System
ss.	Sections (of the MSIA)

Supporting documentation

Documentation referred to in this audit can be found via the links below:

- State Law Publisher, www.slp.wa.gov.au
- Mines Safety and Inspection Act 1994
- Mines Safety and Inspection Regulations 1995
- Electricity (Licensing) Regulations 1991
- Department of Mines Industry Regulation and Safety (DMIRS) mining safety publications <http://www.dmp.wa.gov.au/Safety/Mining-Safety-publications-16162.aspx>
- Accident and incident reporting - guideline
- Energy Safety Code of Practice - Safe Low Voltage Work Practices By Electricians <https://www.commerce.wa.gov.au/publications/code-practice-safe-low-voltage-work-practices-electricians>
- Australia and other standards, SAI Global <http://infostore.saiglobal.com/store/>
 - AS/NZS 3000:2007 Electrical installations (Wiring Rules)
 - AS 3007.5 Electrical installations – Surface mines and associated processing plants
 - AS 3012 Electrical installations – Construction and demolition sites

1 Appointment of electrical supervisors

Appointment of electrical supervisors

Point	Standard	Guideline
1.1	One or more Electrical Supervisors have been appointed.	<p>Intent:</p> <p>To verify the mine is under the control of one or more Electrical Supervisor(s) and the number of appointments is sufficient for effective 'day to day' control of electrical work carried out.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Compare appointments with parts of the mine and any commute cycles.</p> <p>Refer to MSIA s. 44 and MSIR r. 5.10.(1).</p>
1.2	Electrical Supervisors hold requisite qualifications.	<p>Intent:</p> <p>To verify that Electrical Supervisors hold electrical engineering qualifications acceptable for corporate membership of the Institution of Engineers Australia, or a WA Electrician's Licence.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>View and assess licence/qualifications held.</p> <p>Refer to MSIR r. 5.10.(2)(a).</p>
1.3	Electrical Supervisors have the requisite experience.	<p>Intent:</p> <p>To verify that Electrical Supervisors have a minimum of 2 years relevant experience of electrical work in mining, or other heavy industry.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Assess periods of appointment and previous employment history.</p> <p>Refer to MSIR r. 5.10.(2)(b).</p>

1.4	The manager has provided a written summary of responsibilities and duties to each appointed Electrical Supervisor.	<p>Intent: To verify that the appointed electrical supervisor clearly understands the requirements of the role.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess written summary of duties and responsibilities provided.</p> <p>Refer to MSIA s. 44(1) and MSIR 5.11.</p>
1.5	Details relating to Electrical Supervisor appointments and cancellations are recorded in the Record Book.	<p>Intent: To verify that accurate records are maintained.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess appointments and cancellations in the Record Book.</p> <p>Refer to MSIR r. 5.10.(4).</p>
1.6	Electrical Supervisors have acknowledged their appointments by signing in the Record Book and on any instrument of appointment.	<p>Intent: To verify that electrical supervisors have been instructed in the requirements of the appointment.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View acknowledgements of appointment in the Record Book and on any instrument.</p> <p>Refer to MSIA s. 44.(3).</p>

2 Electrical workers licences

Electrical worker's licences

Point	Standard	Guideline
2.1	Licence details of electrical workers employed or engaged at the mine are recorded.	<p>Intent:</p> <p>To verify that accurate details are recorded and kept for two years after employment ceases:</p> <ol style="list-style-type: none"> 1. name and residential address; 2. number, type and expiry date of the licence registration; 3. period of employment at the mine. <p>Personnel:</p> <p>Manager or delegate, Electrical Supervisor.</p> <p>Method:</p> <p>View records kept and enquire in regard to any possible omissions.</p> <p>Refer to ELR r. 57.</p>
2.2	Electrical installing work is undertaken by persons holding a current 'Electrical Mechanics Licence'.	<p>Intent:</p> <p>To verify that persons undertaking electrical installing work hold the appropriate licence for that work.</p> <p>Personnel:</p> <p>Manager or delegate, Electrical Supervisor and/or relevant licence holders.</p> <p>Method:</p> <p>Check details in Section 1 of Electrical Logbook against licence records.</p> <p>Refer to MSIR r. 5.9 and ELR r. 19.</p>
2.3	Electrical workers operate within the authority of the licence or permit held.	<p>Intent:</p> <p>To verify that electrical workers do not work outside the authority of their licence e.g. apprentices or restricted licence holders</p> <p>Personnel:</p> <p>Manager or delegate, Electrical Supervisor and/or relevant licence holders.</p> <p>Method:</p> <p>Identify licence holders other than a WA Electrician's Licence from the licence register and enquire in regard to electrical work those persons undertake.</p> <p>Refer to MSIR r. 5.9 and ELR r.19.</p>

2.4	Contractors undertaking electrical installing work hold an 'Electrical Contractor's Licence'.	<p>Intent: To verify that electrical contractors performing electrical installation work can legally do so.</p> <p>Personnel: Manager or delegate.</p> <p>Method: Check details of electrical installing work in Section 1 of the Electrical Log Book.</p> <p>Refer to MSIR r. 5.9 and ELR r. 33.</p>
-----	---	--

3 In-house electrical installing work and licence

In-house electrical installing work and licence

Point	Standard	Guideline
3.1	In-house electrical installing work is authorised by an 'In-House Electrical Installing Work Licence' and current 'Certificate of Registration'.	<p>Intent:</p> <p>To verify an employer who is not the holder of an electrical contractors licence and who employs an electrical worker to undertake electrical installing work, holds and maintains the registration of an 'In-House Electrical Installing Work Licence'.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Determine whether in-house electrical installing work is carried out, view the 'In-House Electrical Installing Work Licence' held and assess currency of registration.</p> <p>Refer to ELR r. 37.</p>
3.2	An 'In-House Electrical Installing Work Licence' and a current 'Certificate of Registration' is displayed in a conspicuous place.	<p>Intent:</p> <p>To verify that the licence has been applied for, approved and is renewed annually. The nominated 'In-house Nominees' are approved and current.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>View and assess the licence and registration certificate displayed.</p> <p>Refer to ELR rr. 43.(1) and 45.(1).</p>
3.3	At least one eligible 'Nominated Electrical Worker' is currently employed by the 'In-House Electrical Installing Work Licence' holder.	<p>Intent:</p> <p>To verify that competent personnel are employed at the mine site. It is an offence to carry out 'In-House Electrical Installing Work' if the holder of the 'In-House Electrical Installing Work Licence' does not currently employ at least one eligible person to be a 'Nominated Electrical Worker'.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Identify one 'Nominated Electrical Worker' and assess eligibility.</p> <p>Refer to ELR r. 37.</p>

3.4	Details of electrical installing work are recorded in an Electrical Log Book.	<p>Intent:</p> <p>To verify electrical installation work is performed by licensed electrical workers and testing of such work is recorded and certified.</p> <p>Personnel:</p> <p>Appointed Electrical Supervisors and or In-house Nominees.</p> <p>Method:</p> <p>Review details of electrical installing work recorded in Log Book(s).</p> <p>Refer to MSIR r. 5.14.</p>
-----	---	---

4 Appointment of high-voltage operators

Appointment of high-voltage operators

Point	Standard	Guideline
4.1	The manager has appointed one or more 'High-voltage Operators'.	<p>Intent: To verify that electrical workers are trained and competent to manage high voltage infrastructure on a mine site.</p> <p>Personnel: Manager or delegate, Electrical Supervisor.</p> <p>Method: Determine whether high voltage equipment is installed and details of person(s) that the manager has appointed as 'High Voltage Operator' where applicable.</p> <p>Refer to MSIA s. 44, MSIR r. 5.18.(1).</p>
4.2	Persons appointed as 'High-voltage Operator' are competent.	<p>Intent: To verify that a 'Competent Person' has knowledge, training and experience that qualifies the person to perform the specified duties.</p> <p>Personnel: Manager or delegate and/or appointed 'High Voltage Operators'.</p> <p>Method: Interview appointees and/or assess records demonstrating competence.</p> <p>Refer to MSIR r. 5.18.(1).</p>
4.3	The manager has provided a written summary of responsibilities and duties to each appointed 'High-voltage Operator'.	<p>Intent: To verify that a 'High Voltage Operator' has a clear description and understands the requirements of the role.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess written summary of duties and responsibilities provided.</p> <p>Refer to MSIA s. 44.(1).</p>

4.4	Details of 'High-voltage Operator' appointments are recorded in the Record Book.	<p>Intent: To verify that accurate records are maintained and details include the areas of responsibility and any limitations imposed.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess appointments details recorded in the Record Book.</p> <p>Refer to MSIA s. 44 and MSIR rr. 5.18.(2)(3)</p>
4.5	'High-voltage Operators' have acknowledged their appointments by signing in the Record Book and on any instrument of appointment.	<p>Intent: To verify that 'High Voltage Officers' have been instructed in the requirements of the appointment.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View acknowledgement of appointment signatures in the Record Book and on any instrument.</p> <p>Refer to MSIA s. 44.(3).</p>

5 Electrical log books

Electrical log books

Point	Standard	Guideline
5.1	An Electrical Log book is kept at the mine.	<p>Intent: To verify that information required under the MSIR is recorded. More than one Electrical Log Book may be kept relating to different parts of the mine.</p> <p>Personnel: Manager or delegate, Electrical Supervisor.</p> <p>Method: View the Electrical Log Book(s) kept at the mine. Refer to MSIR r. 5.13.(1)(a).</p>
5.2	Entries made in Electrical Log Books are properly completed.	<p>Intent: To verify that information entered in Log Books are in ink and be adequate for the purpose. It is acceptable to enter brief references that indicate where more comprehensive information can be found.</p> <p>Personnel: Appointed Electrical Supervisors.</p> <p>Method: View the Electrical Log Book(s) kept at the mine. Refer to MSIA s. 89 and MSIR r. 5.13.(1)(a).</p>
5.3	Electrical Log books are solely used for the purpose of recording details that are required to be recorded pursuant to the Mines Safety and Inspection Act 1994 and Regulations 1995.	<p>Intent: To verify that the electrical record book is used for the recording of electrical information only, Installing information in Section 1 and other electrical information required in Section 2.</p> <p>Personnel: Appointed Electrical Supervisors.</p> <p>Method: View entries in the Electrical Log Book(s) kept at the mine. Refer to MSIA s. 89.(1)(a).</p>

5.4	<p>Entries in Electrical Log Books are acknowledged by a signature of the Registered Manager or delegate.</p>	<p>Intent:</p> <p>To verify that Mine Managers are being informed of electrical work being performed on a mine site, the mine manager shall sign each completed page in Section 1 and Section 2.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>View signatures acknowledging entries in Electrical Log Book(s).</p> <p>Refer to MSIA s. 89.(1)(a) and MSIR r. 5.13.</p>
5.5	<p>Electrical Log Books are kept safe and in good order from commencement of mining operations.</p>	<p>Intent:</p> <p>To verify that accurate electrical records are kept for the life of mine.</p> <p>Personnel:</p> <p>Manager or delegate, Electrical Supervisor.</p> <p>Method:</p> <p>Assess condition and continuity of Electrical Log Book(s) kept at the mine.</p> <p>Refer to MSIA s. 89.(2).</p>

6 Electrical accidents and incidents

Electrical accidents and incidents

Point	Standard	Guideline
6.1	Electrical accidents and dangerous occurrences are reported to the regulatory authorities.	<p>Intent:</p> <p>To verify that every occurrence involving electricity is immediately reported to the District Inspector. Electrical accidents that have caused or are likely to cause danger to life or property must also be reported to the relevant Supply Authority or the Office of Energy.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Compare site details of accidents/incidents with DMIRS records.</p> <p>Refer to MSIA ss. 76, 78, 79 and ELR r. 63.</p>
6.2	Electrical accidents and dangerous occurrences are recorded in the Mines Record Book and Electrical Log Book.	<p>Intent:</p> <p>To verify that accurate details are recorded. Reportable accidents involving personal injury must also be reported through the SRS system.</p> <p>Personnel:</p> <p>Manager or delegate and appointed Electrical Supervisors.</p> <p>Method:</p> <p>Review accident/incident details entered in the Mines Record Book and Electrical Log Book.</p> <p>Refer to MSIA s. 76 and MSIR r. 5.11.</p>
6.3	Accidents and dangerous occurrences are appropriately investigated.	<p>Intent:</p> <p>To verify that every electric shock or burn, fire, or dangerous occurrence involving electricity is appropriately investigated by an appointed Electrical Supervisor.</p> <p>Personnel:</p> <p>Appointed Electrical Supervisor.</p> <p>Method:</p> <p>Interview Electrical Supervisor(s) and review sample investigation reports.</p> <p>Refer to MSIR r. 5.11.(d).</p>

6.4	Electrical workers and assistants have been instructed in resuscitation methods for dealing with apparent death due to electric shock.	<p>Intent: To verify that electrical workers are trained in resuscitation methods to assist and maintain life until the arrival of medical personnel.</p> <p>Personnel: Manager or delegate.</p> <p>Method: Review and assess training records.</p> <p>Refer to MSIR r. 4.13.</p>
-----	--	--

7 Electrical plans and records

Electrical Plans and Records

Point	Standard	Guideline
7.1	Plans showing the location and details of high-voltage cabling and equipment are kept at the mine.	<p>Intent: To verify that current plans of high voltage installations are accurate and available to facilitate high-voltage access permit procedures, training and any other use.</p> <p>Personnel: Manager or delegate.</p> <p>Method: Review details and currency of high-voltage installation plans kept.</p> <p>Refer to MSIR r. 5.13.(1)(b)(i) and MSIR r. 5.18.(2)(a).</p>
7.2	Plans showing the locations and details of low-voltage and high-voltage cables installed in the ground are kept at the mine.	<p>Intent: To verify that plans showing the locations and details of low-voltage and high-voltage cables buried in the ground are accurate and available to facilitate the use of excavation permit.</p> <p>Personnel: Manager or delegate.</p> <p>Method: Check availability plans showing buried cabling and check currency by reviewing any records of recent buried cable installation work.</p> <p>Refer to MSIR r. 5.13.(1)(b)(iii) and MSIR r. 5.31.(2).</p>
7.3	Plans which delineate and indicate the classification of 'hazardous-areas' in which explosion-protected equipment must be installed are kept at the mine.	<p>Intent: To verify that a 'hazardous area' is defined as an area in which an explosive atmosphere is present, or may be expected to be present, in such quantities as to require special precautions for the construction, installation and use of electrical equipment.</p> <p>Personnel: Manager or delegate.</p> <p>Method: Review details and check currency of 'hazardous area' plans kept.</p> <p>Refer to MSIR r. 5.3 and AS/NZS 3000:2007 c. 7.7.2.2.</p>

7.4	A 'Verification Dossier' containing compliance certification and all other required information relating to explosion-protected equipment installed in 'hazardous-areas' at the mine, is kept and maintained.	<p>Intent: To verify that 'hazardous area' relevant information required to be kept in a 'Verification Dossier' is maintained as per AS/NZS 60079.14:2009 c. 4.2.</p> <p>Personnel: Manager or delegate.</p> <p>Method: Review Verification Dossier plans required to be kept.</p> <p>Refer to MSIR rr. 5.3, 5.4 and AS/NZS 3000:2007 c. 7.7.2.4.</p>
-----	---	--

8 Supervision of electrical work

Supervision of electrical work

Point	Standard	Guideline
8.1	Appointed Electrical Supervisors verify that electrical work at the mine is supervised.	<p>Intent: To verify that 'Electrical Supervisor(s)' understand which electrical workers require supervision. Special provisions apply to apprentices.</p> <p>Personnel: Electrical Supervisors.</p> <p>Method: Identify any electrical workers that are required to be supervised and assess levels of supervision established and whether they are acceptable.</p> <p>Refer to MSIR r. 5.11.(a) and ELR r. 50.</p>
8.2	Electrical apprentices, permit holders and 'B' grade licence holders have been instructed regarding electrical work undertaken that requires supervision.	<p>Intent: To verify that 'Supervised Electrical Workers' understand the limits of their authority when performing electrical work. Refer to item 8.1 above.</p> <p>Personnel: Appointed Electrical Supervisors.</p> <p>Method: Interview relevant employees and/or assess records.</p> <p>Refer to MSIR rr. 5.9, 5.11.(a) and ELR r. 50.</p>
8.3	'Supervising Electrical Workers' have been instructed regarding their supervising responsibilities.	<p>Intent: To verify that 'Supervising Electrical Workers' understand their authority when supervising other electrical workers. Refer to item 8.1 above.</p> <p>Personnel: Appointed Electrical Supervisors.</p> <p>Method: Interview 'Supervising Electrical Workers' and/or assess records.</p> <p>Refer to MSIR rr. 5.9, 5.11.(a) and ELR r. 50.</p>

8.4	Electrical workers are inducted in regard to equipment and systems of work applicable to each workplace.	<p>Intent:</p> <p>To verify that electrical workers required to work in workplaces that they may not be familiar with receive appropriate induction prior to commencing work.</p> <p>Personnel:</p> <p>Electrical Supervisors and individual electrical workers.</p> <p>Method:</p> <p>Discuss with Electrical Supervisors and assess records.</p> <p>Refer to MSIR r. 4.13.</p>
8.5	'In-House Nominated Electrical Worker(s)' check, test and certify electrical installing work carried out at the mine.	<p>Intent:</p> <p>To verify that electrical installing work is carried out by licensed electrical workers and in accordance with relevant regulations, codes and standards. Refer audit point 3.3 regarding Nominated Electrical Worker(s).</p> <p>Personnel:</p> <p>In-house Nominated Electrical Worker(s).</p> <p>Method:</p> <p>Review and assess entries in section 1 of Electrical Log Book(s).</p> <p>Refer to MSIR r. 5.14 and ELR rr. 51, 52, 53.</p>
8.6	Work on or in close proximity to energised low-voltage conductors is only carried out in accordance with a procedure complying with the applicable Energy Safety Code of Practice.	<p>Intent:</p> <p>To ensure the safest practical methods are employed by electrical workers.</p> <p>Personnel:</p> <p>Electrical Supervisors and individual electrical workers.</p> <p>Method:</p> <p>Sight procedure or interview relevant employees.</p> <p>Refer to Energy Safety Code of Practice - Safe Low Voltage Work Practices By Electricians.</p>

9 High-voltage access permit procedure

High-voltage access permit procedure

Point	Standard	Guideline
9.1	A written procedure has been established to safeguard work on or in close proximity to exposed high-voltage conductors.	<p>Intent:</p> <p>To verify that the procedures describe how this work is to be performed and that work party members have ready access to them.</p> <p>Note: Those procedures for safeguarding against inadvertent contact or close approach to overhead powerlines by plant capable of breaching requisite safety clearances are assessed in audit element 10.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Review and assess established procedures.</p> <p>Refer to MSIR r. 5.18.(2).</p>
9.2	Electrical workers have been instructed and assessed in regard to 'High-voltage access permit procedure'.	<p>Intent:</p> <p>To verify that all electrical workers, whether appointed as 'High-Voltage Operator(s)' or otherwise, are instructed in regard to the procedure for authorising high-voltage electrical work.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Assess training records and/or interview a selection of electrical workers.</p> <p>Refer to MSIR rr. 5.18.(2) and 4.13.</p>
9.3	Work in close proximity to high-voltage conductors is not permitted unless authorised by a 'High-voltage access permit' issued by a 'High Voltage Operator'.	<p>Intent:</p> <p>To verify that all safety measures are in place before commencing this type of work. Workers must 'sign on' to begin work and 'sign off' when their involvement in the work is completed.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Review procedure and view copies of access permits issued.</p> <p>Refer to MSIR r. 5.18.(2)(f).</p>

9.4	'High-voltage access permits' adequately describe the work to be undertaken and all necessary safety measures effected.	<p>Intent: To verify that instructions are clear and requirements are being consistently adhered to.</p> <p>Personnel: Manager or delegate. And/or appointed 'High Voltage Operators'.</p> <p>Method: Review procedure and details on cancelled access permits.</p> <p>Refer to MSIR r. 5.18.(3).</p>
9.5	Isolation of high-voltage equipment for access, maintenance or repair purposes is conducted in accordance with a switching program prepared and checked by a 'High Voltage Operator'.	<p>Intent: To verify that the safe methods of work prescribed in the program are complied with.</p> <p>Personnel: Manager or delegate. And/or appointed 'High Voltage Operators'.</p> <p>Method: Review switching programmes on record and check authorising signatures.</p> <p>Refer to MSIR rr. 5.18.(2)(e) and 5.18.(3).</p>
9.6	'High-voltage access permits' reference and are accompanied by a respective switching program.	<p>Intent: To verify that the correct methods of work and isolation prescribed in both documents are complied with. Each document shall reference the identification number of the other.</p> <p>Personnel: Manager or delegate. And/or appointed 'High Voltage Operators'.</p> <p>Method: Review access permit details and switching programmes on record.</p> <p>Refer to MSIR rr. 5.18.(2)(e) and 5.18.(3).</p>
9.7	Isolation of high-voltage equipment for access, maintenance or repair purposes is conducted by a 'High Voltage Operator'.	<p>Intent: To verify the isolations referred to are those required to access, maintain or repair exposed high voltage conductors.</p> <p>Personnel: Manager or delegate and/or appointed 'High Voltage Operators'.</p> <p>Method: Review authorising signatures on 'Access Permits'.</p> <p>Refer MSIR r. 5.18.(2)(b).</p>

9.8	'High-voltage access permits' are not authorised prior to equipment being isolated, discharged, proved de-energised, short-circuited, connected to earth and tagged.	<p>Intent:</p> <p>To verify that the methods of work prescribed in are complied with. Authorisation to commence work must not be granted in advance of effecting necessary safeguards.</p> <p>Personnel:</p> <p>Manager or delegate. And/or appointed 'High Voltage Operators'.</p> <p>Method:</p> <p>Review and verify that the procedure reflect this aspect.</p> <p>Refer to MSIR rr. 5.18.(2)(e) and 5.18.(3).</p>
9.9	Work party members do not commence work before signing on to the ' High-voltage access permit'.	<p>Intent:</p> <p>To verify the permit has been sighted and any safety instructions are understood by the work party and all the members of the work party have signed on to the permit.</p> <p>Personnel:</p> <p>Manager or delegate. And/or appointed 'High Voltage Operators'.</p> <p>Method:</p> <p>Review procedures and view copies of access permits issued.</p> <p>Refer to MSIR r. 5.18.(2)(f).</p>
9.10	'High-voltage access permits' are not cancelled prior to all work party members signing off of the access permit.	<p>Intent:</p> <p>To verify all work party members have completed their involvement in the work and signed off the permit.</p> <p>Personnel:</p> <p>Manager or delegate and/or appointed 'High Voltage Operators'.</p> <p>Method:</p> <p>Review procedures and view copies of access permits issued.</p> <p>Refer to MSIR r. 5.18.(2)(f).</p>
9.11	Records of 'High-voltage access permits' are kept for 2 years.	<p>Intent:</p> <p>To ensure that records are kept for a minimum of 2 years. This assists in demonstrating that the system of work is being consistently adhered to.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>View copies of cancelled high-voltage access permits kept on record.</p>

9.12	Suitable apparel, test instruments, earthing and operating equipment are provided and maintained for safely effecting high-voltage isolations.	<p>Intent:</p> <p>To verify that high voltage apparel and test equipment is maintained, calibrated where required and tested regularly as fit for purpose.</p> <p>Personnel:</p> <p>Manager or delegate and/or appointed 'High Voltage Operators'.</p> <p>Method:</p> <p>View and assess suitability and condition of high-voltage operating equipment and apparel provided.</p> <p>Refer to MSIR r. 5.18.(2)(d).</p>
------	--	--

10 Powerline corridor access permit procedure

Powerline corridor access permit procedure

Point	Standard	Guideline
10.1	A written procedure has been established to safeguard against inadvertent contact or close approach to an energised overhead powerline by plant that is capable of breaching the requisite safety clearances.	<p>Intent:</p> <p>To verify that the procedures describe how this work is to be performed and that work party members have ready access to them. This audit element does not apply if overhead powerlines are not installed at the mine. Access procedures are not required for powerlines that are de-energised.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Review and assess written procedures if overhead powerlines are installed.</p> <p>Refer to MSIR r. 5.18.(2)(d).</p>
10.2	The procedure addresses emergency response methods for dealing with inadvertent machinery contact with an overhead powerline.	<p>Intent:</p> <p>To verify how an emergency situation is to be managed and controlled.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Review and verify procedure addresses the hazards likely to arise from electrified vehicles and tyre explosions.</p> <p>Refer to MSIA s. 9.</p>
10.3	Relevant plant operators have been instructed and assessed in regard to access procedures.	<p>Intent:</p> <p>To verify training has been carried out and plant operators understand their instructions.</p> <p>Personnel:</p> <p>Manager or delegate and a selection of plant operators.</p> <p>Method:</p> <p>Assess training records kept and/or interview a selection of plant operators.</p> <p>Refer to MSIR r. 4.13.</p>

10.4	The procedure indicates the requisite minimum powerline clearance to be maintained when plant operates in a powerline corridor.	<p>Intent:</p> <p>To verify the required minimum clearances are those specified in AS3007.5 (the procedure may stipulate greater clearances).</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Review and assess written procedure.</p> <p>Refer to MSIR r. 5.28.(1)(c) and AS 3007.5 (or corresponding reference in AS/NZS 3007:2013).</p>
10.5	The procedure prohibits the operation of plant in a powerline corridor unless the requisite clearance can be assured.	<p>Intent:</p> <p>To verify that personnel or equipment are prevented from entering prohibited zones in powerline corridors.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Review and assess written procedure.</p> <p>Refer to MSIR r. 5.28.(1)(d) and AS 3007.5.</p>
10.6	The procedure prohibits the operation of plant elevating parts that do not afford the required clearances when fully raised, unless authorised by a 'powerline corridor access permit'.	<p>Intent:</p> <p>To identify any hoisting equipment that may be capable of entering prohibited zones in powerline corridors.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Review and assess written procedure.</p> <p>Refer to MSIR r. 5.28.(1)(d) and AS 3007.5.</p>
10.7	The manager has appointed in writing one or more competent person(s) for the purpose of issuing 'powerline corridor access permits'.	<p>Intent:</p> <p>To verify that only trained and competent personnel are issuing powerline corridor access permits.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>Review details of person(s) that the manager has appointed to issue 'Powerline Corridor Access Permits' and verify sufficient persons have been appointed.</p> <p>Refer to MSIA s. 44 and MSIR r. 5.28.(1)(d).</p>

10.8	Details of persons appointed to issue 'Powerline corridor Access permits' are recorded in the Record Book.	<p>Intent: To verify the registered manager has appointed permit corridor access permit issuer(s).</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess appointments recorded in the Record Book.</p> <p>Refer to MSIA s. 44.</p>
10.9	Persons appointed to issue 'Powerline corridor access permits' have acknowledged their appointments by signing in the Record Book and on any instrument of appointment.	<p>Intent: To verify that permit issuers understand their areas of responsibility and any limitations imposed.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View acknowledgement of appointment signatures in Record Book and on any instrument.</p> <p>Refer to MSIA s. 44.(3).</p>
10.10	The manager has provided a written summary of responsibilities and duties to persons appointed to issue 'Powerline corridor access permits'.	<p>Intent: To verify that permit issuers have been instructed in their areas of responsibility and any limitations imposed.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess written summary of duties and responsibilities provided.</p> <p>Refer to MSIA s. 44.(1).</p>
10.11	'Powerline corridor access permits' stipulate necessary safeguards to be effected that will assure the requisite safety clearances will be maintained.	<p>Intent: To verify that the required safety clearances prescribed in the permit will be maintained.</p> <p>Personnel: Manager or delegate and/or persons appointed to issue 'Powerline corridor access permits'.</p> <p>Method: Review procedures and records of access permits issued.</p> <p>Refer to MSIR r. 5.28.</p>

10.12

Records of 'Powerline corridor access permits' are kept for 2 years.

Intent:

To ensure that records are kept for a minimum of 2 years. This assists in demonstrating that the system of work is being consistently adhered to.

Personnel:

Manager or delegate.

Method:

View records of access permits issued.

11 Ground excavation permit procedure

Ground excavation permit procedure

Point	Standard	Guideline
11.1	A written procedure has been established to safeguard persons required to excavate ground in the vicinity of cables buried in the ground.	<p>Intent: To verify that the procedures describe how this work is to be performed and that work party members have ready access to them.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess written procedures.</p> <p>Refer to MSIR r. 5.31.(2).</p>
11.2	Employees have been instructed and assessed in regard to the excavation permit procedure.	<p>Intent: To verify that the work party members have access to safe work instructions and understand them.</p> <p>Personnel: Manager or delegate.</p> <p>Method: Assess training records kept and/or interview a selection of employees.</p> <p>Refer to MSIR r. 4.13.</p>
11.3	Excavation work in the vicinity of buried cables is not commenced unless authorised by a 'Ground excavation permit'.	<p>Intent: To verify that work areas where digging is to take place has been reviewed and approved.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View written procedures and verify provision for the issue of permits.</p> <p>Refer to MSIR r. 5.31.(2).</p>
11.4	The manager has appointed sufficient competent persons for the purpose of issuing 'Ground excavation permits'.	<p>Intent: To verify that 'Ground Excavation Permits' can be raised as and when required and the Permit Issuer(s) is qualified to raise said permits.</p> <p>Personnel: Manager or delegate.</p> <p>Method: Review details of person(s) appointed to issue 'Ground excavation permits'.</p> <p>Refer to MSIA s. 44 and MSIR r. 5.31.(2).</p>

11.5	Details of persons appointed to issue 'Ground excavation permits' are recorded in the Record Book.	<p>Intent: To verify that details include any areas of responsibility and limitations imposed.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess authorisations recorded in the Record Book.</p> <p>Refer to MSIA s. 44.</p>
11.6	Persons appointed to issue 'Ground excavation permits' have acknowledged their authorisations by signing in the Record Book and on any instrument conveying that authority.	<p>Intent: To verify that 'Appointed Person(s)' have read and understand their areas of responsibility and any limitations imposed.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View acknowledgements of appointment signatures in Record Book and on any instrument.</p> <p>Refer to MSIA s. 44.(3).</p>
11.7	The manager has provided a written summary of responsibilities and duties to persons appointed to issue 'Ground excavation permits'.	<p>Intent: To verify that responsibilities and duties are clearly identified and described including the area, range of duties and responsibilities the 'Appointed Person(s)' are accepting.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess written summary of duties and responsibilities provided.</p> <p>Refer to MSIA s. 44.(1).</p>
11.8	Persons appointed to issue 'Ground excavation permits' are required to consult current plans and specifically identify the worksite location prior to issuing a permit.	<p>Intent: To verify that systems are in place to avoid reoccurrence of any previous accidents that have resulted from failures to verify plans, verify that plans are current and /or identify the specific worksite location.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View written procedures and verify these requirements are provide for.</p> <p>Refer to MSIR r. 5.31.(3).</p>

11.9	Persons appointed to issue 'Ground excavation permits' detail on the permit the safeguards that must be adhered.	<p>Intent:</p> <p>To verify that personnel can describe any safety practices that need to be observed, that these practices are also prescribed in the permit and will be maintained.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>View written procedures and verify these requirements are provided for.</p> <p>Refer to MSIR r. 5.31.(3)(c).</p>
11.10	Records of 'Ground excavation permits' issued are kept for 2 years.	<p>Intent:</p> <p>To ensure that records are kept for a minimum of 2 years. This assists in demonstrating that the system of work is being consistently adhered to.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>View records of 'Ground excavation permits' issued.</p>

12 Trailing cable operating procedures

Trailing cable operating procedures

Point	Standard	Guideline
12.1	Written procedures have been established for safeguard trailing cables used at the mine.	<p>Intent: To verify that 'Trailing Cables' are protected from damage by vehicles in particular and also from environmental damage.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess written procedure.</p> <p>Refer to MSIR r. 5.21.(c).</p>
12.2	Relevant plant operators have been instructed and assessed regarding trailing cable operating procedures.	<p>Intent: To verify training and competency of plant operators to work in the vicinity of trailing cables.</p> <p>Personnel: Manager or delegate and selection of plant operators.</p> <p>Method: Assess training records kept.</p> <p>Refer to MSIR r. 5.21.(c) and MSIR 4.13.</p>
12.3	Procedures describe the safeguards to be effected when trailing cables are anchored, extended, retrieved, energised and de-energised.	<p>Intent: To verify that systems are in place to instruct work parties in the safe handling of trailing cables.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess written procedure.</p> <p>Refer to MSIR r. 5.21.(c).</p>
12.4	Procedures require the installation of signs and barriers to prohibit vehicle access into places where trailing cables are at risk from damage.	<p>Intent: To verify that procedures describe any physical safety equipment required to protect trailing cables.</p> <p>Personnel: Manager or delegate.</p> <p>Method: View and assess written procedure.</p> <p>Refer to MSIR r. 5.21.(c).</p>

12.5	Procedures require any face sump pump, to be directly connected to an underground Jumbo-drill when the machine is operating at the face.	<p>Intent:</p> <p>To verify a face pump supply cable that is not directly connected via the Jumbo machine as this can provide an alternative electrical earth return path and negate the effectiveness of the Jumbo trailing cable earth-continuity protection device.</p> <p>Personnel:</p> <p>Manager or delegate.</p> <p>Method:</p> <p>View and assess written procedure.</p> <p>Refer to MSIR r. 5.21.(b).</p>
12.6	Is there a procedure in place to prohibit the manual handling of trailing and reeling cables while energised?	<p>Intent:</p> <p>To ensure there are systems in place to avoid injury or possible electric shock when persons are manually handling trailing cables while energised.</p> <p>Personnel:</p> <p>Electrical Supervisors</p> <p>Method:</p> <p>View and assess written procedure.</p>

13 Statutory electrical maintenance

Statutory electrical maintenance

Point	Standard	Guideline
13.1	Electrical equipment and cables that are likely to become hazardous are periodically examined and tested at intervals which verify safety and the results are recorded in an Electrical Log Book.	<p>Intent:</p> <p>To verify periodic examination and testing of cables and equipment, to identify and remedy any defects likely to result in an unsafe condition. A brief reference may be entered in an Electrical Log Book describing where more comprehensive examination and test results can be found.</p> <p>Personnel:</p> <p>Appointed Electrical Supervisors.</p> <p>Method:</p> <p>Review maintenance system and the records in Electrical Log Book(s).</p> <p>Refer to MSIR rr. 5.27.(2)(a) and 5.27.(4)(b).</p>
13.2	Portable electrical apparatus normally used in a heavy operating environment is examined, tested and tagged quarterly, and the results are recorded in an Electrical Log Book	<p>Intent:</p> <p>To verify that portable apparatus normally used in workshops, mining areas, processing areas and construction sites are examined, tested quarterly and the results are entered in an Electrical Log Book.</p> <p>Personnel:</p> <p>Appointed Electrical Supervisors.</p> <p>Method:</p> <p>Review records entered in Electrical Log Book(s).</p> <p>Refer to MSIR rr. 5.27.(2)(b) and 5.27.(4).</p>
13.3	Portable electrical apparatus brought to the mine by contractors for use in heavy operating environments is inspected prior to use to verify that the apparatus has been examined, tested and tagged in the previous three months.	<p>Intent:</p> <p>To verify that portable apparatus brought to site by contractors is tested and fit for purpose. Records of any inspections, examinations and tests carried out on behalf of the contractor must be recorded in the Electrical Log Book.</p> <p>Personnel:</p> <p>Appointed Electrical Supervisors.</p> <p>Method:</p> <p>Review records of inspections, examinations and tests entered in Log Book(s).</p> <p>Refer to MSIR rr. 5.27.(2)(b) and 5.27.(4).</p>

13.4	The effectiveness of earthing systems, continuity of earthing conductors and the adequacy of electrical insulation is routinely tested, and the results are recorded in an Electrical Log Book.	<p>Intent:</p> <p>To verify any unsafe conditions arising from ineffective earthing systems, discontinuity of earthing conductors and inadequate electrical insulation is avoided by systematic testing.</p> <p>Personnel:</p> <p>Appointed Electrical Supervisors.</p> <p>Method:</p> <p>Review records entered in Log Book(s).</p> <p>Refer to MSIR rr. 5.27.(2)(c) and 5.27.(4).</p>
13.5	Earth leakage devices required to be installed in a quarry operation, on parts of a dredge other than a floating treatment plant, and underground in a mine are tested monthly and the results are recorded in an Electrical Log Book.	<p>Intent:</p> <p>To verify that earth leakage devices required to be installed in a quarry operation, on part of a dredge other than a floating treatment plant, or in an underground mine are tested monthly.</p> <p>Personnel:</p> <p>Appointed Electrical Supervisors.</p> <p>Method:</p> <p>Review records entered in Log Book(s).</p> <p>Refer to MSIR rr. 5.27.(2)(d) and 5.27.(4).</p>
13.6	Earth leakage devices required to protect alternating current circuits supplying portable, mobile or moveable apparatus are periodically tested and the results are recorded in an Electrical Log Book.	<p>Intent:</p> <p>To verify that earth leakage devices required to be installed in all parts of the mine are tested 'periodically'. Industry best practice is regarded as quarterly.</p> <p>Personnel:</p> <p>Appointed Electrical Supervisors.</p> <p>Method:</p> <p>Review records entered in Log Book(s).</p> <p>Refer to MSIR rr. 5.24.(1)(b) and 5.27.(2)(a).</p>
13.7	Earth continuity devices required to be installed in a quarry operation, on parts of a dredge other than a floating treatment plant, and underground in a mine are tested monthly and the results are recorded in an Electrical Log Book.	<p>Intent:</p> <p>To verify that testing of earth continuity devices required to be installed in a quarry operation, on part of a dredge other than a floating treatment plant, or in an underground mine are tested monthly.</p> <p>Personnel:</p> <p>Appointed Electrical Supervisors.</p> <p>Method:</p> <p>Review records entered in Log Book(s).</p> <p>Refer to MSIR rr. 5.27(2)(d) and 5.27(4).</p>

13.8

Earth continuity protection and monitoring devices required to be installed in a mine are tested periodically and the results are recorded in an Electrical Log Book.

Intent:

To verify that testing is carried out 'periodically'.
Industry best practice is regarded as quarterly.

Personnel:

Appointed Electrical Supervisors.

Method:

Review records entered in Log Book(s).

Refer to MSIR rr. 5.32.(2) and 5.27.(2)(a).