

SAFETY

GUIDELINES

FOR

ELECTRICAL

WORKERS



Government of **Western Australia**
Department of **Commerce**
Energy Safety



Foreword

Every electrical worker must work safely, not only for themselves, but also for others.

Working safely includes not only the work procedure adopted but also the tools used and the clothing worn.

This booklet provides advice on how safety can be achieved and maintained by every electrical worker.



SAFETY GUIDELINES FOR ELECTRICAL WORKERS

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SAFETY GUIDELINES FOR ELECTRICAL WORKERS

Supervision of electrical workers

Most people share the concern shown by the government, employers, unions, the electrical industry, network operators and EnergySafety about accidents involving electrical workers.

It is especially tragic for accidents and fatalities to be suffered by those requiring supervision under the Electricity (Licensing) Regulations 1991 but have not been adequately supervised. These clearly are preventable accidents.

What is adequate supervision?

Whether you are an employer supervisor or an electrical worker under supervision, it is important to understand your obligations under the Electricity (Licensing) Regulations 1991.

These guidelines will assist in understanding these obligations and for improving workplace safety.

Safety

Employer duty

The primary duty of care rests with the employer or supervising electrical worker to determine the level of supervision required to maintain safety. Consideration should be given to the type of work to be undertaken, the knowledge and skill levels of the electrical worker and the safety equipment required.

Employee duty

Employees also have a duty of care to protect their own health and safety and that of the people encountered during the performance of their work. Electrical workers should not embark on tasks for which they feel unprepared or clearly are risky.

Supervised electrical workers

Certain categories of electrical workers must be supervised.

They are electrical:

- apprentices/trainees; and
- permit holders.

NOTE: None of the above electrical workers may supervise other electrical workers.

Safety equipment

The use of protective clothing and equipment is an essential part of accident prevention.

- Employers and employees must be aware of the needs for each task.
- Employers should provide additional safety equipment required by specific tasks such as insulated gloves, mats and covers and barriers.
- Employees should have proper clothing, such as safety helmets, footwear and glasses.

Type of work

Variations in the work environment, whether connected to electricity supply or not, present many situations which the supervising electrical worker must assess as part of determining safety requirements for a particular task. The assessment will determine the form of supervision appropriate for the supervised electrical worker involved.

Knowledge and skills of electrical workers

The supervising electrical worker must assess the technical knowledge, practical skills and maturity/experience of the apprentice/trainee or permit holder.

Where relevant, the information available from the apprentice training assessment system should also be used.

Levels of supervision

Regulation of the Electricity (Licensing) Regulations 1991 states that electrical work must be effectively supervised for the purpose of preventing danger to life and property.

Two levels of supervision may be applied:

- **Direct (constant) supervision** – the personal supervision of a worker, at all times, on a direct (constant) basis, by a person licensed to carry out all the work without supervision.
- **General supervision** – general supervision does not require constant attendance of the supervisor. General supervision must be given by a person licensed to carry out the work without supervision. The nature of the work and the competence of the person undertaking it need to be considered.

Under general supervision, the supervising electrical worker should attend the work place, explain the task, ensure the worker understands it and carry out any isolation that may be required. The supervising electrical worker should return to the work place as often as considered necessary to ensure effective supervision.

Apprentices/Trainees

The degree of supervision (direct or general) requires continual assessment of an apprentice's/trainee's experience and competence related to the task being undertaken. It can vary from direct to general supervision, depending upon the type of work and the electrical worker's progress in achieving competencies.

A gradual relaxation of supervision is logical as an apprentice/trainee develops the skills, knowledge and experience leading to a trade qualification.

The table 'Supervision guidelines for apprentices and trainees' provides further clarification of the levels of supervision.

Permit holders

Permit holders require general supervision. An assessment of the individual's ability is required to ensure supervision is sufficient for safe work. The level of supervision may be varied, depending on the complexity of the task.

Live work should be avoided.

All work carried out by a permit holder must be tested and checked by a person licensed to carry out the work without supervision.

Work standards

The supervising electrical worker is responsible for checking and testing all electrical work carried out to ensure compliance with the appropriate Acts, Regulations and Australian Standards, particularly *AS/NZS 3000 Wiring Rules*.

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Supervision guidelines for apprentices

This table is to be used as a guideline only. The level of supervision may be varied dependant upon the competence of the apprentice/trainee.

Type of work	Apprentice/Trainee (year)	Supervision required
New installations (not connected to electricity supply)	1st 2nd 3rd 4th or Final	Direct Direct/General General General
Alterations and additions (existing installations)*	1st 2nd 3rd 4th or Final	Direct Direct Direct General
Maintenance of installations and equipment*	1st 2nd 3rd 4th or Final	Direct Direct General (under isolation permit system) General
Workshop tasks*	1st 2nd 3rd 4th or Final	Direct General General General
Live work	1st 2nd 3rd 4th or Final	* * * Direct
Isolation of installations and equipment	1st 2nd 3rd 4th or Final	* * Direct General

*Live work is not permitted to be carried out until fourth or final year.

Isolation and tagging

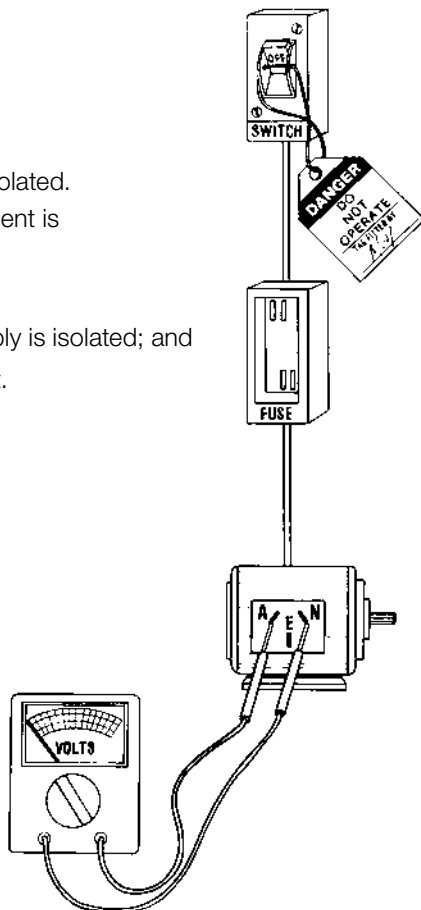
Isolation and tagging procedures cover basic safety principles and isolation requirements to protect personnel and equipment. Before any repairs or alterations are commenced, the electrical circuits or equipment to be worked on must be entirely disconnected from the electricity supply, unless other adequate precautions are taken to prevent electric shock.

Before starting work:

1. Switch off
2. Isolate circuits
3. Fit appropriate tags
4. Test that the electricity supply is isolated.

Always check that the test equipment is operating correctly by:

- checking the test instrument;
- testing that the electricity supply is isolated; and
- rechecking the test instrument.



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Danger tags

A danger tag on an item of equipment is a warning to all persons that the equipment is being worked on and must not be operated, as lives may be placed in danger.



A circuit must not be energised while a danger tag is attached. Danger tags are for the safety of personnel and must be:

- **fitted and removed only by the person who signed the tag;**
- placed at common isolation points; and
- removed upon completion of the work or, if the work will continue at the end of the shift, removed and replaced with a new tag.

NOTE: All persons involved in the work being carried out must fit their own danger tag.

Out of Service tags

This tag is a notice to all persons to identify appliances or equipment that are out of service for repairs and alterations. While an Out of Service tag is fitted, the appliance or equipment must not be operated.

Out of Service tags are for the isolation and protection of equipment and must be:

- fitted and removed only by authorised persons; and
- placed at common isolation points of the equipment that are unsafe and/or not to be operated.



FRONT

BACK

BEFORE STARTING WORK

- Plan and discuss the job. Include a risk assessment
- Think about what is to be done, including isolation requirements
- Confirm permission to isolate (comply with any access or vicinity permit system applicable to the site)
- Isolate the electrical equipment or circuit
- Fit a “Danger” tag
- Erect safety barriers where required
- Use the correct earthing equipment
- Cover adjacent live apparatus with insulating blankets
- Test before starting work (check test instruments before and after use)
- Start work only when authorised to do so

If in doubt, ask the supervisor

WHEN WORKING

- Use safety observers when required
- Never rely on your memory
- Avoid working on live equipment
- Connect the earth and neutral conductors first
- Check the isolation points and re-test before resuming work after a break

ON COMPLETION OF WORK

- Check that tools are not left on or in the job
- Check that the work is complete and has been tested before the equipment is energised
- Notify all personnel involved that the equipment will be energised
- Relinquish your work permit (if relevant)
- Remove your “Danger” tag
- Check all “Danger” or “Out of Service” tags have been removed
- Remove your own earthing equipment
- Energise supply and confirm correct operation of the system
- Remove and store all safety barriers and other equipment

SAFETY PRACTICES

- Know the electric shock and resuscitation procedure
- Keep a first aid kit handy
- Check the first aid kit regularly
- Know where fire extinguishers are located and how to operate them
- Know the correct type of fire extinguisher for the various types of fires
- Keep your work place clean and orderly
- Report all electrical accidents to:
 - your employer (who must report the accident immediately to the relevant network operator).
 - Contractors shall report electrical accidents to the relevant network operator immediately

TOOLS

- Regularly check and clean all tools and equipment
- Use approved safety belts
- Use insulated ladders
- Use non-conducting tape measures

Note: Insulated tools should not be relied upon as the sole means of protection against electric shock.

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Every electrical worker should ensure that they always use approved safety equipment in the work place.

When purchasing protective clothing and equipment, ensure that it complies with the relevant Australian or International Standard.

PROTECTIVE CLOTHING

Clothing provides protection from:

- 1) *electric arcing/flash burns*
- 2) *flying or falling objects*
- 3) *electric shock*

Ideally, clothing should cover the body completely and:

- be of cotton material;
- have non-conductive and concealed buttons;
- have sleeves to wrist length; and
- have legs reaching to the footwear.



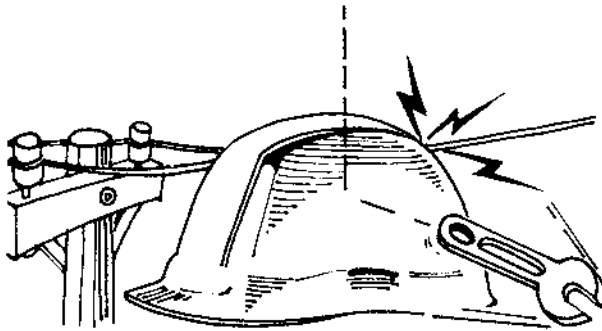
Safety helmets

Safety helmets provide protection from:

- 1) Overhead wires/structures
- 2) Falling objects

All helmets should be:

- non-conductive; and
- comply with Australian/New Zealand Standard AS/NZS 1801.

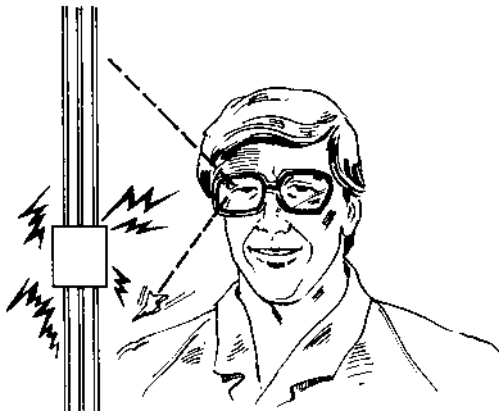


Safety glasses

Safety glasses provide protection from:

- 1) Electrical arcing
- 2) Flying objects

Safety glasses should conform to Australian Standard AS 1337.



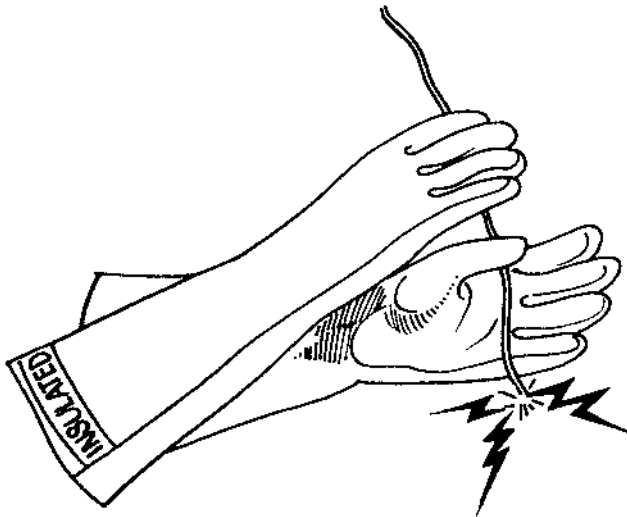
Insulating gloves

Insulating gloves provide protection from electric shock.

Special gloves should be worn when accidental contact with live conductors is possible, but they must never be the sole means of insulation. When using gloves, note the following:

- All gloves are to be inspected each time before use
- Rated gloves should comply with Australian Standard AS 2225
- Rated gloves are to be tested regularly
- Non-rated gloves are for mechanical protection only

Refer to the Standards for storage, washing, maintenance and retesting requirements.

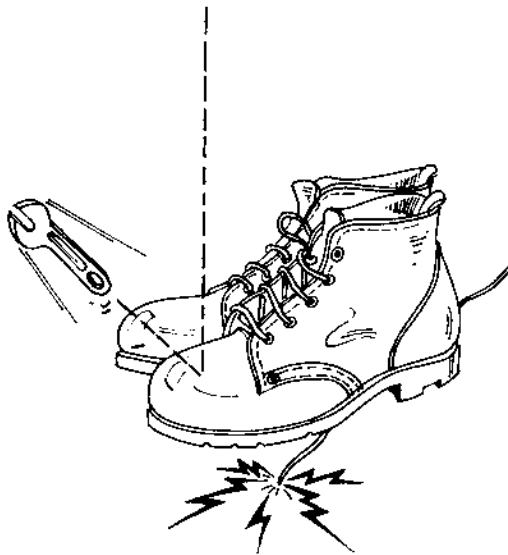


Safety footwear

Safety footwear provides protection from:

- 1) *Electric shock*
- 2) *Falling objects*

Safety footwear should be non-conductive and have a covered steel toe cap to Australian/New Zealand Standard AS/NZS 2210.



Insulating mats

Insulating mats should be used when working on live conductors or where accidental contact is possible. They must never be relied upon as the sole means of insulation.

Insulating mats for voltages less than 1000 volts should comply with AS/NZS 2978.

Electrical shock survival

The diagram at the back of this booklet shows an acceptable method of CPR. The information is provided as a quick reference only.

Persons trained in rescue and resuscitation should refresh their knowledge of the procedures at least annually.

Further information and training in first aid and other resuscitation procedures is available from recognised training providers.

All electrical workers and their assistants should have current first aid and resuscitation skills.

Reporting electrical accidents

All electrical accidents, including minor shocks, must be reported to:

- the employer; and
- the relevant electricity network operator.

Note: When an electric shock is reported to your employer, the employer is required to notify the occurrence to the relevant network operator.

Investigation of electric shocks and accidents

Electricity network operators and EnergySafety have a legislative role to investigate all incidents of electric shocks. In this way, the cause of the accident can be determined and procedures set in place to prevent a recurrence.

Reporting remote-area electric shocks

Reports of electric shocks in Western Australia, where there is no network operator call EnergySafety by telephoning:

FREECALL 1800 678 198

This phone number is for use within Western Australia only.

ELECTRIC SHOCK

RESCUE PROCEDURE

- **DANGER:** Check for your own safety and the safety of the bystander and casualty.

ISOLATE THE ELECTRICITY

High Voltage: Wait until the electricity is turned off.

Low Voltage (240/415): Immediately switch off the electricity. If this is not practicable pull or push the casualty clear of the electrical contact using dry non-conducting material (wood, rope, clothing, plastic or rubber).

DO NOT USE METAL OR ANYTHING MOIST.

RESUSCITATION

REMEMBER: Electric shock may stop the victim's breathing. Delay in rescue and resuscitation may be fatal.

Immediately send for help and commence —

RESPONSE: Check for response, gently shake and loudly shout, if no response, then:

Step 1: AIRWAY

Turn the casualty on their side as for the Recovery position: Open mouth and check for any obstructions. If present clear then open airway.



Step 2: BREATHING

Check breathing for up to 10 seconds.

LOOK: For chest movement.

LISTEN: For breathing.

FEEL: For breathing on your hand.



Step 3: If no breathing, turn casualty on their back and give:

A: 2 Rescue Breaths

1. Tilt the head back and open airway.
 2. Pinch nose.
 3. Seal your mouth over casualty's mouth.
 4. Blow casualty's mouth until chest rises.
- Give 2 quick breaths. Check breathing and circulation for 10 seconds. If no signs of life commence CPR until signs of life return.



B: Mouth to Nose Resuscitation

1. Close casualty's mouth.
2. Lift and tilt chin.
3. Blow into casualty's nose.

Step 4: CIRCULATION CPR

Position hands on lower half of breast bone.
Give 30 heart compressions followed by 2 quick breaths
Depress breast bone to 1/3 at the rate of 100 compressions a minute.
Continue CPR (30:2) until signs of life return.



NOTE: CPR means Cardio-Pulmonary Resuscitation.

Step 5: RECOVERY POSITION

When signs of life returned, place casualty into recovery position, keep monitoring until medical aid arrives or trained assistance takes over.



TRAINING IN RESUSCITATION

- This information is produced as a quick reference.
- Persons trained in rescue and resuscitation should refresh their knowledge of the first aid skills annually.
- If you are interested in further training in First Aid and other resuscitation skills, we suggest you attend a recognised training course.
- Please report all electrical accidents to the relevant Network Operator and the Director of Energy Safety. Network Operator or EnergySafety electrical inspectors investigate all electrical accidents. This information is used to prevent future accidents.



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