

electrical

focus

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Unenclosed joints in insulated cables

The article “Unenclosed joints constitute a defect” in Electrical Focus No 35 (April 2005) addressed the findings of the State Coroner’s investigation into the electrocution of a licensed electrical mechanic and foreshadowed an EnergySafety policy that:

... unenclosed joints in insulated cables constitute a defect and must be corrected.

The Electrical Focus article attracted a number of industry comments and concerns about the proposed policy.

Industry concerns were discussed with the Electrical & Communications Association of WA and Western Power Corporation’s Principal Inspector and this has resulted in a revised EnergySafety policy on this important safety issue.

EnergySafety’s policy and implementation strategy are restated below. The objective of this policy is to allow the owners of premises to plan for the remedial work to be carried out.

The Policy

Unenclosed joints in insulated cables in ceiling spaces and similar areas of existing installations are a serious potential hazard and must be made safe.

Implementation Strategy

EnergySafety’s policy will be implemented in stages.

Until 31 December 2007:

Where an installation on which work is to be done (or has been done) is found to contain unenclosed joints, the electrical

contractor/electrician is to inform the owner/occupier of the situation and advise that remedial work is to be carried out and completed within three years. An advisory leaflet (provided by EnergySafety) to that effect is to be handed to the occupier. If the occupier is not the owner of the premises, the occupier is to be requested to the advisory leaflet to the owner.

The electrical contractor is to record the advisory leaflet serial number in Section 8 (Comments and Additional Details) of the Notice of Completion.

The remedial action that should be completed within this three-year period can be either:

- to have the unenclosed joints enclosed in accordance with AS/NZS 3000 Wiring Rules; or
- to install total RCD protection (protecting both power and lighting circuits) – preferably through 2 or more RCDs.

The obligation to have the remedial work carried out rests with the owner/occupier of the premises.

From 1 January 2008 to 31 December 2009:

All of the above requirements are to apply. However, the remedial work must be completed within 12 months.

From 1 January 2010 onwards:

All of the above requirements are to apply. However, the remedial work must be completed within 28 days.

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EnergySafety



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The Advisory Leaflet

EnergySafety will provide sequentially numbered advisory leaflets to electrical contractors on demand, in books of 25 leaflets free of charge. A sample leaflet is enclosed with this edition [No. 36] of the Electrical Focus.

During consultation on implementation of this policy, concerns were raised about possible regulatory action if the leaflet number is not recorded on the Notice of Completion. Those concerns are unfounded – it is not a regulatory requirement to record such information. The inclusion of a leaflet number is only to reinforce to the owner/occupier the importance of the information contained in the leaflet.

EnergySafety will not initiate prosecution or disciplinary proceedings against any electrical contractor or electrician who does not record the leaflet number on the Notice of Completion. Network operators will be similarly advised not to pursue such actions against electrical contractors or electricians who do not record the number or inform the network operator of the leaflet number.

However, EnergySafety encourages electrical contractors and electricians to record the number, as this will enhance the credibility of the process of alerting owners/occupiers to this important safety issue.

EnergySafety is committed to ensure the ongoing safety of the public, industry workers and consumers. The full support of electrical contractors and electricians is important for the success of this policy.

Copies of the numbered advisory leaflet are available in single sheet and in books of 25 from EnergySafety's Licensing Office. The leaflets can be collected from the Licensing Office, or, alternatively can be mailed out – please contact the Licensing Office by email at energylicensing@docep.wa.gov.au or by telephone on 9422 5282, to make arrangements.

Reporting electrical accidents immediately – evidence not to be disturbed

There have been several instances recently in which electrical contractors and electricians have not reported electrical accidents **immediately** to the relevant network operator and to the Director of Energy Safety, in accordance with Regulation 63 of the *Electricity (Licensing) Regulations 1991*.

In three separate instances, electrical contractors were notified that a person had received an electric shock. In each case, the electrical contractor despatched an electrician to the incident site to effect repairs to make the installation safe. In all instances, the electrical contractor reported the occurrence to the network operator later that day or during the following day.

In one of the instances, the electrician also altered the electrical installation and interfered with the electrical wiring. In another of the instances, the electrical worker accessed the Western Power pillar and altered the connection of the consumer mains wiring (which is part of Western Power's service apparatus) without authorisation.

In all of the instances, the electricians made no attempt to contact the network operator to arrange for an officer or inspector to attend. They also did not consider other possible actions to make the installation safe, such as by turning the main switch off or by asking people to keep away from the installation until the network operator attended.

In these scenarios, the electrical contractors/electricians put themselves in a precarious positions, firstly because the accidents were not reported immediately and secondly because the operatives had interfered with evidence (thus hindering subsequent investigations). These are serious breaches of Regulations 63 and 63A respectively of the *Electricity (Licensing) Regulations 1991*.

If an electrical contractor or electrician receives notification of an electric shock, then he or she must **immediately** report the incident to the network operator by **telephone** (facsimile or email is not acceptable – there is no confirmation that the correct person has received the message).

Furthermore, if an electrical contractor attends site and the network operator is still not in attendance, then the electrical contractor should arrange to keep others away from the dangerous parts of the installation to prevent further electrical accidents. Electrical contractors/electricians should not endanger others or themselves by attempting to diagnose and isolate the fault – other than to turn the main switch off or unplug suspected faulty equipment etc.

In summary, it is imperative that all electrical accidents or shocks are reported immediately to ensure that the situation is made safe and so that an investigation can commence if required.

Network operators have staff available at all times to respond to incidents where the public may be in danger. Emergency contact details for the relevant network operators are listed in the telephone directories.

EnergySafety can be contacted by telephoning 1800 678 198 (all hours).

Electrical safety warning – Metal halide lamps

EnergySafety has recently completed an investigation into several fires at an installation that contained metal halide lamps.

Industry is reminded that metal halide lamps need to be installed and, importantly, operated in accordance with the manufacturers' instructions. This is particularly important because of two end-of-life operating modes that a metal halide lamp may enter:

Mode 1. Failure to ignite upon restart- a lamp will attempt to ignite or 'restrike' on a continual basis, causing repetitive high current flow which may lead to excessive overheating of the control gear.

Mode 2. End of life lamp rupture – where lamps are operated continuously, arc tube explosions may occur, resulting in non-passive end-of-life lamp rupture.

Our recent investigation revealed that overheating of the control gear (Mode 1 failure) caused the fire damage to the premises.

Manufacturers are aware of the above problems and publish information to assist equipment installers and owners/operators to achieve reduced risk operation.

For installers (electrical contractors), this includes:

- Control gear enclosures – to be metal (preferably steel) and placed in a well-ventilated area avoiding contact with combustible material;
- Control gear 'over current' protection – install suitable over current protection for each control gear/ lamp set;
- Where lamps are required to operate continuously – install circuit components to ensure a 15 minute 'off cycle' every seven days of continual operation; and
- Prevent continual restriking – install 'timed igniters'.

For installation owners/operators, this includes:

- The stated manufacturers' maintenance is to be carried out; and
- Group relamping prior to the end of the rated lamp life is to be carried out.

It is important that electrical contractors provide the appropriate manufacturer supplied information to the installation owner/occupier so they too are aware of these concerns.

Cooking appliance functional switch causes an unsafe installation

Clause 4.3.11 of AS/NZS 3000:2000 "Wiring rules" requires that a functional switch be provided for a circuit to a fixed or stationary cooking appliance. Suitable switches are available for this purpose.

It is essential that accessory manufacturers' connection instructions be followed. Failure to follow a manufacturer's connection instructions may lead to an unsafe installation.

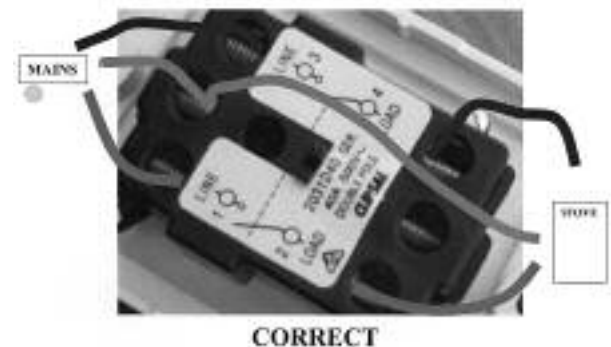
In a recent incident, an electrician connected a popular brand functional switch without reference to the manufacturer's instructions. He mistakenly connected the final sub circuit earthing conductor through the switch by connecting it to the "earth" terminal and the "loop" terminal – there is no connection between the earth terminal and loop terminals. He also connected the active and neutral conductors to the "line" terminals, thus utilising the switch as a double pole switch.

It was later discovered that the cooking appliance was not earthed and was unsafe. The electrician clearly did not check that the cooking appliance was earthed. Testing of the continuity of the earthing conductor would have identified this fault immediately.

This particular switch is designed to switch two active (line) conductors. The switch also has a "loop" terminal to join the neutral conductors and an "earth" terminal to join the earthing conductors.



This is how the switch was incorrectly connected



This is how the switch should have been connected

This incident highlights the importance of:

- reading and following manufacturers' instructions;
- reading and understanding the markings on terminals of electrical accessories and equipment; and
- carrying out adequate checking and testing of the electrical work.

Prosecutions for breaches of Legislation 1 February 2005 to 30 June 2005

<i>Breach</i>	<i>Name (and suburb of residence at time of offence)</i>	<i>Licence No.</i>	<i>Fine (\$)</i>	<i>Court Costs (\$)</i>
<i>Carried out electrical work without holding an electrical workers licence Regulation 19(1) E(L)R</i>	<i>David Lloyd (Edgewater)</i>	NA	1,000.00	388.45
<i>Carried out electrical work without holding an electrical licence Regulation 19(1) E(L)R</i>	<i>Gordon Elam (Maddington)</i>	NA	750.00	345.00
<i>Carried out substandard electrical work Regulation 49(1) E(L)R</i>	<i>Bradley Morrissey (Bullsbrook)</i>	EW 116418	1,000.00	568.90
<i>Permitted unsafe wiring or equipment to be connected Regulation 50A E(L)R</i>	<i>Bruce McKenna (Pannawonica)</i>	EW 112879	650.00	420.70
<i>Submitted a Notice of Completion in relation to work not carried out Regulation 52(3) E(L)R</i>	<i>Coral Coast Electrical (West Perth)</i>	EC 004245	4,500.00	310.45
<i>Failed to report an accident Regulation 63 E(L)R</i>	<i>Mark Daley (Bullsbrook)</i>	NA	100.00	217.70
<i>¹ The supply authority connected the electricity supply without ensuring that all service apparatus was installed and maintained in a safe condition Regulation 242 ER</i>	<i>Western Power Corporation T/As Western Power (Perth)</i>	NA	15,000.00	343.45
	<i>Western Power Corporation T/As Western Power (Perth)</i>	NA	15,000.00	683.45
	<i>Western Power Corporation T/As Western Power (Perth)</i>	NA	15,000.00	343.45
	<i>Western Power Corporation T/As Western Power (Perth)</i>	NA	13,000.00	1,500.00
	<i>Western Power Corporation T/As Western Power (Perth)</i>	NA	15,000.00	343.45
	<i>Western Power Corporation T/As Western Power (Perth)</i>	NA	15,000.00	343.45
<i>The network operator did not ensure that each prescribed Corporation T/As activity was, so far as was reasonable and practicable, carried out in such a way as to provide for the safety of persons Regulation 10 E(SS&SS)R</i>	<i>Western Power Western Power (Perth)</i>	NA	10,000.00	7,500.00

Legend:

NA	Not applicable (no licence held)
ER	Electricity Regulations 1947
E(L)R	Electricity (Licensing) Regulations 1991
E(SS&SS)R	Electricity (Supply Standards & System Safety) Regulations 2001

¹ The multiple prosecutions of Western Power Corporation were for offences at Tuart Hill, Wyndham, Port Hedland, Narrogin, East Victoria Park and Willagee.

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