

Managing Electrical Safety on Boats

Note

Throughout this document there are several specific terms with which you should be familiar, and they are defined in the dictionary below. These terms are identified in *italics* where they first appear.

Introduction

The Queensland *Electrical Safety Act 2002* (the Act) is directed at eliminating the human cost to individuals, families and the community of death, injury and destruction that can be caused by electricity.

The Act and its subordinate legislation, the *Electrical Safety Regulation 2002* (the Regulation), set out the obligations that employers, employees, workers, designers, manufacturers, importers, and persons in control of *electrical equipment* must meet in order to comply with the requirements of the law.

The fundamental principle of the legislation is to set requirements in law to ensure that *electrical installations* and electrical equipment are *free from electrical risk*. This means that for a person or property, the electrical risk is as low as can be reasonably achieved having regard to the likelihood of harm and the likely severity of harm.

What is this guide about?

Following enquiries from marine industry stakeholders this document has been prepared to assist relevant obligation holders to manage electrical safety. It provides information to help:

- clarify your electrical safety obligations;
- identify *prescribed electrical equipment*;
- identify *non-prescribed electrical equipment*; and
- identify appropriate ways to control electrical safety risk.

As the regulator of outcome based legislation, the Electrical Safety Office is not in a position to provide a determination or comment on compliance, or to provide legal interpretations. This document is intended as a guide to the practical application of the electrical safety legislation and is provided as an information source only. It should not be treated as advice on the circumstances in any particular case. The material in the guide does not have any legal status.

In addition, this guide does not alter any other regulatory requirements under the Act for electrical work. For example, a person performing electrical work on a marine craft must comply with provisions for safe electrical work.

Application

This guide applies to marine craft being sold or hired to the general public. For example recreational craft sold for private use or craft chartered or hired.

Because of the focus on prescribed electrical equipment, which is typically household type, this guide is not intended to apply to marine craft being used solely for commercial purposes (e.g. fishing trawlers and supply ships). However electrical safety obligations and requirements may still apply to these craft.

Obligations under the Electrical Safety Act 2002

The Act imposes obligations on persons who may affect the electrical safety of others by their acts or omissions.

For example, an importer of electrical equipment has an obligation to ensure that the electrical equipment is safe. This includes ensuring that the equipment is designed to be *electrically safe* and is tested and examined to ensure it is electrically safe.

A person may have electrical safety obligations in more than one capacity. For example, a person who conducts a business or undertaking that includes manufacturing of marine craft may hold electrical safety obligations as an employer and as a designer, manufacturer, importer and supplier of electrical equipment. Obligation holders are required to determine, achieve and maintain compliance in each capacity.

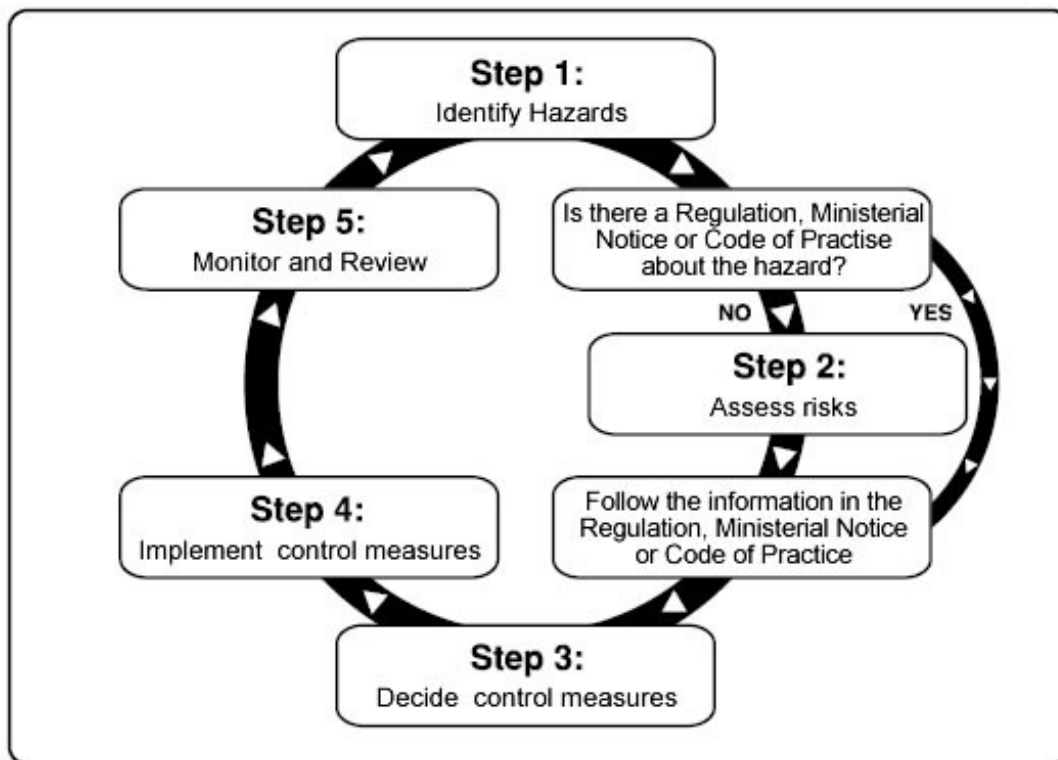
How can you meet your obligations for electrical safety?

Under the Act, there are three ways obligation holders can meet their obligation for electrical safety. These ways are through regulations, ministerial notices, or codes of practice. Where applicable, obligation holders must comply in the following manner to discharge obligations:

- If there is a regulation prescribing a way of discharging your electrical safety obligation, you will fail to meet your obligation if you contravene the regulation.
- If there is a ministerial notice about meeting an electrical safety obligation in relation to an electrical risk, you will fail to meet your obligation if you contravene the ministerial notice.
- If there is a code of practice about meeting an electrical safety obligation, you will fail to meet that obligation if you:
 - contravene the code, or act in a way inconsistent with the code; and
 - do not follow a way that is at least as effective as the code of practice.

Where there is no regulation, ministerial notice or code of practice advising how to meet your electrical safety obligation under the circumstances, you should be able to demonstrate that you chose an appropriate way, took reasonable precautions and exercised proper diligence to discharge the safety obligation.

The risk management approach is an appropriate way to make a judgment about the risks associated with hazards and implement appropriate control measures.



You can manage electrical safety by:

- identifying the hazards;
- assessing the risk that may result because of the hazards;
- deciding on control measures to prevent or minimise the level of the risk;
- implementing control measures; and
- monitoring and reviewing the effectiveness of the measures.

The risk management hierarchy of control measures begins with the most preferred measure, eliminating the hazard, then substituting, redesigning equipment or process, isolating the hazard, using administrative controls, and using personal protective equipment. The least preferred measure is last in the hierarchy. You should begin selecting control measures at the top of the hierarchy, and only select lower order control measures when the higher order control measures are not possible.

Requirements for electrical equipment

Prescribed electrical equipment

A person who sells or hires *prescribed electrical equipment* must comply with section 100(1) of the Regulation. In summary the Regulation requires all prescribed electrical equipment to be approved prior to being hired or sold. To be approved the equipment must be shown, through a test report from an approved testing entity, to comply with the safety requirements of the relevant standard as in force when the approval is given.

Prescribed electrical equipment means the electrical equipment listed in schedule 3 of the Regulation if it meets the regulatory definitions as listed in AS/NZS 4417.2 Appendix E. Prescribed electrical equipment commonly found on craft includes safety switches, circuit breakers and battery chargers.

One of the key defining criteria for prescribed electrical equipment is whether it is 'household type or household use'. For instance a refrigerating appliance will fall within the regulatory definitions if it is a 'household type' and cools and stores food. The Electrical Safety Office applies the definition of 'household type' to mean equipment manufactured for intended or likely use in a domestic environment. The application of 'household type or household use' criteria to electrical equipment found in marine craft is consistent with the previous and continuing regulatory application to electrical equipment found in caravans.

Typically 'household type or household use' electrical equipment is stand alone and could be immediately operated as supplied if connected to a suitable power supply. The means of connection may be by flexible cord and plug or by direct connection to fixed wiring. The equipment is usually taken on board the craft for connection to the electrical installation without further manufacture or electrical work assembly processes required. This does not preclude electrical equipment that may need building into an enclosure as per manufacturers' installation instructions to prevent access to live parts.

Examples of electrical equipment commonly found on marine craft which the ESO consider 'household type or household use' and therefore prescribed electrical equipment include, but are not limited to, bread toasters, microwave ovens and refrigerators.

It is important that the regulatory definitions are read in their entirety and attention paid to the inclusions and exclusions within the definitions. For instance an appliance connector is defined as:

An electrical device which –

- a) Is for attachment to a flexible cord; and
- b) Makes a detachable connection between the conductors of the cord and the pins or contacts of any low voltage appliance or equipment of a type intended or generally used for household applications:

But does not include –

- c) A connector within the scope of AS/NZS 3123; or
- d) A plug or socket-outlet within the scope of AS/NZS 3131.

Non-prescribed electrical equipment

A person who sells non-prescribed electrical equipment must comply with section 120 of the Regulation. Generally speaking all non-prescribed electrical equipment must comply with the safety criteria of AS/NZS3820 (*Essential safety requirements for low voltage electrical equipment*). This would include, but not be limited to:

- a test report showing compliance to the relevant Australian product standard;
- if no relevant Australian product standard exists, a test report showing compliance to another relevant standard such as AS/NZS3350.1, AS/NZS60335.1 or AS/NZS 3100;
- a certificate of approval issued as per relevant Australian/NZ legislation;
- another method consistent with clause 5 of AS/NZS 3820

Equipment listed in schedule 3 of the Regulation which does not meet the regulatory definitions of AS/NZS 4417.2 Appendix E is non-prescribed. For example:

- appliance connectors or cord extension sockets that fall within the scope of AS/NZS3123¹;
- plugs or socket-outlets within the scope of AS/NZS 3131¹;
- cord extension sockets and outlet devices with a rating greater than 20A;
- television receivers without a single cathode tube, such as plasma screen and LCD devices; and
- water heaters with a capacity less than 4.5l or greater than 680l, or instantaneous types that do not have live parts in contact with the water.

Electrical installations

Some equipment through a process of onboard electrical work and manufacture, conducted by appropriately qualified persons who ensure the final assembly is electrically safe, become an electrical installation. Examples include, but are not limited to:

- a refrigeration system that is build onboard with a separate compressor connected to one or more condenser units in one or more cooled cavities (freezer, ice maker or fresh food refrigerated compartments); or
- a power supply system/battery charger manufactured onboard using a transformer, separate rectification assembly and separate voltage regulation parts.

¹ Verification that equipment falls with the scope of AS/NZS 3123 or AS/NZS 3131 would be demonstrated by having a suitable test report to either standard or its equivalent international electrotechnical (IEC) standard.

Individual pieces of electrical equipment that make up the installation may be either prescribed or non-prescribed and each should be managed accordingly.

Further Sources of Information

Electrical Safety Office

Telephone: 1300 650 662

Telephone (outside Queensland): 07 3225 2000

Email: equipmentsafety@deir.qld.gov.au

Maritime Safety Queensland

MSQ is a government agency attached to Queensland Transport responsible for:

- improving maritime safety for shipping and small craft through regulation and education;
- minimising vessel-sourced waste and responding to marine pollution;
- essential maritime services such as pilotage for regional ports and aids to navigation; and
- encouraging and supporting innovation in the maritime industry.

Marine safety legislation and other useful information is available at

www.msq.qld.gov.au

Standards Australia

Australian Standards are acceptable standards for electrical equipment, installations and other issues. They are published and distributed by SAI Global. To obtain further assistance contact SAI Global through their Customer Service Centre:

Telephone: 131 242

Fax: 1300 65 49 49

Overseas Telephone calls (02) 8206 6010

Overseas Faxes (02) 8206 6020

Email: sales@sai-global.com

Web shop: www.sai-global.com/

Dictionary

“electrical equipment” means any apparatus, appliance, cable, conductor, fitting, insulator, material, meter or wire—

- used for controlling, generating, supplying, transforming or transmitting electricity at a voltage greater than extra low voltage; or
- operated by electricity at a voltage greater than *extra low voltage*; or
- that is, or that forms part of, a cathodic protection system.

However, electrical equipment does not include any apparatus, appliance, cable, conductor, fitting, insulator, material, meter or wire forming part of a vehicle if—

- it forms part of a unit of the vehicle that provides propulsion for the vehicle; or
- its source of electricity is a unit of the vehicle that provides propulsion for the vehicle.

‘Vehicle’ means any means of transport by land, air or water.

“electrical installation” means a group of items of *electrical equipment*.

However, a group of items of *electrical equipment* is an electrical installation only if—

- all the items are permanently electrically connected together; and
- the items do not include items that are works of an electricity entity; and
- electricity can be supplied to the group from the works of an electricity entity or from a generating source.

An item of *electrical equipment* can be part of more than one electrical installation.

Please note—an item of electrical equipment connected to electricity by a plug and socket outlet is not permanently electrically connected.

Examples of an electrical installation—

- *the switchboard, wiring, lighting, motors, controls and other electrical equipment permanently connected for an irrigation plant*
- *the switchboard, wiring, lighting, socket outlets and other electrical equipment permanently connected for a dairy.*

“electrical risk” means—

- in relation to a person, the risk to the person of death, shock or injury caused directly by electricity or originating from electricity; or
- in relation to property, the risk to the property of—
 - damage caused by a cathodic protection system; or

- loss or damage caused directly by, or originating from, electricity.

“electrically safe” means—

- for a person or property, that the person or property is free from *electrical risk*;
- for *electrical equipment* or an *electrical installation*, that all persons and property are free from *electrical risk* from the equipment or installation;
- for the way *electrical equipment*, an *electrical installation* or the works of an electricity entity are operated or used, that all persons and property are free from *electrical risk* from the operation or use of the equipment, installation or works;
- for the way electrical work is performed, that all persons are free from *electrical risk* from the performance of the work;
- for the way a business or undertaking is conducted, that all persons are free from *electrical risk* from the conduct of the business or undertaking; and
- for the way *electrical equipment* or an *electrical installation* is installed or repaired, that all persons are free from *electrical risk* from the installing or repairing of the equipment or installation.

“electrical safety” for a person or property, means the person or property is *electrically safe*.

“extra low voltage” means voltage of 50V or less AC RMS, or 120V or less ripple-free DC.

“free from electrical risk” for a person or property means that the *electrical risk* to the person or property is as low as reasonably achievable, having regard to the likelihood of harm and the likely severity of harm.

“non-prescribed electrical equipment” means *electrical equipment* of a type that is not prescribed.

“prescribed electrical equipment” means the *electrical equipment* listed in schedule 3 of the Regulation if it meets the defining standard as listed in AS/NZS 4417.2 Appendix E.

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