



AIMPE

Engineers

Australian Institute of
Marine and Power

HEAD OFFICE

AIMPE Members [all Vessels, including Offshore & FPSO]

5 July 2007

Dear Members

Electrical Safety

All electrical work ashore must, on safety grounds and under State legislation, be performed by a qualified Electrician.

However, those State laws don't clearly apply to ships. Nor have they been replicated federally.

This did not matter when there were Electricians on ships or whilst the industry agreement [made in the MIDC documents around 1990] to train all Engineers in the AEE ["Automation, Electronic & Electrical"] Course were being honoured such that electrical work was only being done by those Engineers who had completed that course.

Your Institute must now warn you that the situation has changed and having regard to your personal safety and your legal liability your Institute recommends:-

1. that on safety grounds no individual member perform electrical work [other than on extra low voltage < 50Volt A.C. equipment] unless the individual is either a qualified Electrician or has satisfactorily completed the AEE Course; and
2. that on safety grounds Chief Engineers and other Engineers in supervisory positions direct that no person under their supervision/control is to perform electrical work [other than on extra low voltage < 50Volt A.C. equipment] unless the individual is either a qualified Electrician or has evidence that he/she has satisfactorily completed the AEE Course.

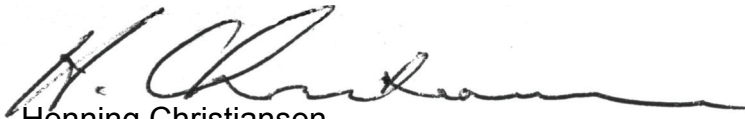
Commonsense must be used; on the one hand you don't need any electrical qualification to change a light bulb but on the other hand even possession of AEE training is NOT EQUIVALENT TO BEING A TRADESMAN ELECTRICIAN!

Please hold an onboard meeting of AIMPE members to discuss this matter and to pass such resolutions as you consider appropriate [e.g. adopting the recommendations above] and advising your company of same.

Any feedback you care to give your Institute in relation to this matter would be appreciated, preferably through your normal Institute official with a copy to me [by email if possible].

Further background is attached for your consideration.

Yours fraternally



Henning Christiansen
FEDERAL SECRETARY

CC Branches

Background: Changes on Electrical Safety in the Maritime Industry

What has changed that you should now act to protect yourself?

- We have had one fatality whereby a Trainee was electrocuted; that is one too many, yet MISA shipowners are becoming lax in providing AEE training; an increasing number of Engineers are untrained in this area, yet are being asked to do the same electrical work as those who are trained.

- Some companies are introducing a number of foreign workers [under S457 Visas or similar] and we understand no effort has been made to provide them with AEE training

- Shipowners/operators are required generally under the 'duty-of-care' inherent in employment law, to provide their employees with a safe workplace and a 'safe-system-of-work'. This is underscored by Marine Orders Part 58 which formalises the requirement on the ship-operator, *and supervisors*, to ensure that every ship to have a codified 'safe-system-of-work' consistent with the ISM Code. That 'safe-system-of-

Marine Orders Part 61 SAFE WORKING ON BOARD SHIPS

5.1.1 The owner of a ship must provide such arrangements, equipment, instructions and training as are necessary to ensure that work on board the ship is carried out in a safe manner, and in particular in relation to:

- (a) general safety considerations;
- (b) dealing with emergencies and emergency equipment;
- (c) dealing with the carriage of dangerous goods;
- (d) safe access to the ship and safe movement about the ship;
- (e) entering and working in enclosed or confined spaces;
- (f) manual lifting and carrying;
- (g) use of tools and materials;
- (h) welding flame cutting and other hot work;
- (i) painting;
- (j) working aloft or over the side;
- (k) **working with electricity and electrical equipment;**
- (l) working with dangerous and irritating substances and radiations;
- (m) upkeep of wire and fibre ropes;
- (n) anchoring, docking and mooring;
- (o) working on deck or in cargo spaces;
- (p) working in machinery spaces;
- (q) working in galleys, pantries and other food handling areas;
- (r) safety in living accommodation;
- (s) safety issues associated with particular vessel types.

5.1.2 The master of a ship must be satisfied that:

- (a) the equipment is maintained in working order and readily available for use; and
- (b) the specified training has been carried out.

work' must "...safeguard against all identified risks..." which clearly must include electrical work.

In particular, Section 6.2 of the ISM Code which states: "The company should ensure that each ship is manned with qualified, certificated and medically fit seafarers in accordance with national and international requirements". and 6.5 of the Code states that: "The company should establish and maintain procedures for identifying any training which may be required in support of the Safety Management System and ensure that such training is provided for all personnel concerned".

- Marine Orders Part 61, Sections 5.1.1 & 5.1.2 are reproduced [right]. On its face it appears that this recent reluctance by shipowners to provide the AEE training is a *breach* of 5.1.1 (k)
- Further to the above point, the ship's master may be in *breach* on each occasion that he/she allows an Engineer to sign-on who is going to be required to do work that might include electrical work, but does not have the AEE training.
- Ship-manager's responsibility is further underscored by Section 11(6) of the Occupational Health and Safety (Maritime Industry) Act 1993 which requires:-

"....An operator **must give employees the information, instruction, training and supervision necessary to enable them to perform their work** in a way that is safe and without risk to their health. An operator may provide information, instruction and training on a prescribed ship or prescribed unit. ..."

- Further to the above point, this imposes the same obligation on the Chief Engineer or other person having supervisory control over the requirement to do electrical work. Thus Chief Engineers or others in supervision can not permit someone to do electrical work whom has not been specifically trained in electrical work.
- The same obligation is imposed on each individual Engineer by the legal requirements on all individual employees, as set out below:-

Occupational Health and Safety (Maritime Industry) Act 1993

27 Duties of employees in relation to occupational health and safety

(1) An employee must, at all times while at work, take all reasonable steps to comply with the rest of this section. An employee who fails to take those steps contravenes this section.

Penalty: 50 penalty units.

(2) **An employee must ensure that he or she does not create a risk, or increase an existing risk (whether by doing something or failing to do something), to his or her own health or safety or to the health or safety of other persons** (whether employees or not) at or near the place where he or she is at work.

(3) An employee must cooperate with the operator, or with any other person, to the extent necessary to enable the operator or other person to fulfil a duty or obligation imposed on the operator or other person by or under this Act.

(4) If:

(a) equipment is supplied to the employee by the operator; and

(b) the equipment is necessary to protect the health and safety of the employee, or of other persons (whether employees or not) at or near the place at which the employee is at work;

the employee must use the equipment, and must use it in accordance with any instructions given by the operator consistent with its safe and proper use.

(5) The choice or manner of use of equipment may be agreed on between the operator and any relevant involved union or agreed on by a health and safety committee.

- the recent decision of the Queensland Government to initiate new Regulations in respect of both Commercial and Recreational vessels, forbidding persons from performing electrical work [other than on extra low voltage < 50Volt A.C. equipment] unless they are a qualified Electrician. Copies of those Regulations are attached.
- Finally, it should be stressed that this document is not about the industrial question of whether shipowners are living up to their undertaking in the MIDC process that all Engineers would be provided with AEE training. We could make that industrial argument to shipowners if we had time to argue about it.

However, having been made aware of the immediate safety issue for our members onboard all ships it is clear that this must be taken up by your Institute as a Safety & Professional matter.

This **urgent** issue is a matter for each individual member to be immediately informed about, consider carefully and then personally take the correct/safe decision to ensure your own personal safety as well as the safety of those around you.

I commend that you personally adopt the Institute's two recommendations and do not permit anyone to intimidate you away from your safety/professional decision.

If you have any questions or concerns please ring your usual Institute official, or myself [0419 400 324].

Non sibi sed omnibus



Henning Christiansen
FEDERAL SECRETARY



MARINE INFORMATION BULLETIN

RECREATIONAL CRAFT

ELECTRICAL STANDARDS AND LICENSED ELECTRICIANS

PURPOSE

This bulletin has been raised to answer questions asked by boat owners and other persons involved with boats about the standards applying to electrical installations on recreational boats and work that must be performed by licensed electrical workers.

Monitoring of recreational craft has revealed substandard electrical installations and electrical work apparently performed by unlicensed persons.

Boat owners are reminded that they must engage the services of an electrical contractor for any mains voltage (230 V or 240 V) work on their boats.

DEFINITIONS

electrical contractor licence

is a licence issued by the Electrical Safety Office authorising a person to conduct a business or undertaking that includes the performance of electrical work

electrical work licence

is a licence issued by the Electrical Safety Office authorising an individual to perform electrical work

electrical mechanic licence authorises the holder to perform all electrical work

electrical fitter licence authorises the holder to perform all electrical equipment work

electrical work

is generally, work at voltages above ELV. Electrical work includes testing and supervising electrical work

voltages

extra low voltage (ELV): means voltage of 50 Volts or less alternating current (a.c.) RMS or 120 V or less ripple-free direct current (d.c.)

low voltage (LV): means voltage greater than extra low voltage but not more than 1000 V a.c. RMS or 1500 V ripple-free d.c.

THE QUESTIONS

What are my responsibilities regarding the electrical installation on my boat?

Under the *Transport Operations (Marine Safety) Act 1994* owners and other persons involved with boats have a general safety obligation regarding the condition of ships, including the condition of a boat's electrical installation.

Low voltage electrical installations and electrical equipment on ships in Queensland must comply with the requirements of the Electrical Safety Act 2002 (ESA).

The ESA provides that only licensed electricians may perform electrical work. A licensed electrician must ensure that electrical work is in accordance with **Australian/New Zealand Standard 3000** known as the **wiring rules** (AS/NZS 3000).

How can I meet my responsibilities regarding the electrical installation on my boat?

Complying with the electrical standards and ensuring that electrical work on boats is performed by a licensed electrician is a way for owners and other persons involved with a boat's electrical systems to meet their general safety obligations.

What standards apply to electrical installations on boats?

The electrician you employ must ensure that the LV installation complies with the wiring rules.

A standard related to the wiring rules, **AS/NZS 3004 – Electrical installations – Marinas and pleasure craft at low voltage**, provides extra guidance related to LV installations on recreational boats.

Another related standard is the **National Standard for Commercial Vessels – Part C Construction – Subsection 5B Electrical, Edition 2** (NSCV C 5B Ed 2), published by the National Marine Safety Committee in 2005. This is a commercial vessel standard that is also suited to electrical installations on recreational craft. This standard provides additional requirements and variations to AS/NZS 3000 necessary to reflect the requirements of the marine industry and the particular environment on ships while satisfying the safety requirements of section 1 of AS/NZS 3000.

AS 1799 – Small pleasure boats code, Part 3 – Engineering, Section 8 Electrical installation provides for extra-low voltage direct current installations on pleasure craft. This standard, published in 1985, is now superseded but is still available and will give guidance to the basic requirements for a good ELV installation.

Will the electrical installation on an imported boat comply?

Imported craft complying with IEC/ISO standards, classification society rules or other known standards will comply with the fundamental safety requirements of section 1 of AS/NZS 3000. However, compliance with section 1 of AS/NZS 3000 is mandatory and some issues of conflict between these other standards and AS/NZS 3000, AS/NZS 3004 or NSCV C 5B Ed 2 can occur. For example, issues such as cable colour codes in LV installations of American built ships will require resolution on a case by case basis in consultation with the Electrical Safety Office before acceptance for compliance.

Any person selling an imported boat, including an import agent, must ensure that the electrical equipment on board complies with Queensland legislation. Prescribed electrical equipment includes such items as circuit breakers, switches, safety switches, refrigerators and microwave ovens. Information about the requirements for approval of electrical equipment and examples of identifying approval marks on electrical equipment is available on the Electrical Safety Office website.

What about maintenance and repairs to the electrical installation on a boat?

Maintenance and repairs to LV electrical installations on boats is electrical work and may only be performed by a licensed electrician.

FURTHER INFORMATION

Marine safety legislation is available on the Maritime Safety Queensland website at www.msq.qld.gov.au.

Copies of the *Electrical Safety Act 2002*, the *Electrical Safety Regulation 2002*, *Codes of Practice* and other publications regarding obligations for electrical safety and electrical equipment are available as downloads at the Electrical Safety Office website at www.eso.qld.gov.au or from:

Electrical Safety Office
Department of Industrial Relations
Level 6, Neville Bonner Building
75 William Street

GPO Box 69
Brisbane Qld 4001
Tel. 1300 362 320

The National Standard for Commercial Vessels is available for free download at the National Marine Safety Committee's website at www.nmsc.gov.au.

Australian Standards are available from SAI Global Ltd. SAI Global can be contacted by phone on 13 12 42, by email at sales@sai-global.com and their website is www.saiglobal.com.

CONTACT INFORMATION

If you require further information about this Marine Information Bulletin, please contact:

Ken Gray
Maritime Safety Branch
Telephone: 07 3120 7352
Fax: 07 3120 7355

Other Marine Information Bulletins covering various topics relating to the safe operation of ships may be obtained from the Maritime Safety Queensland website at www.msq.qld.gov.au and from the following Marine Operations Centres.

Airlie Beach (07) 4946 2200
Bundaberg (07) 4131 8500
Cairns (07) 4052 7400
Gladstone (07) 4973 1200
Mackay (07) 4944 3700

Mooloolaba (07) 5477 8425
Pinkenba (07) 3860 3500
Southport (07) 5539 7300
Townsville (07) 4726 3400



MARINE INFORMATION BULLETIN

COMMERCIAL SHIPS

ELECTRICAL STANDARDS AND LICENSED ELECTRICIANS

PURPOSE

This bulletin has been raised to answer questions asked by ship owners, operators and masters, ship designers and builders, marine surveyors and others involved with commercial ships regarding the standards applying to electrical installations on ships and work that must be performed by appropriately licensed electrical workers. Monitoring of commercial ships has revealed substandard electrical installations and electrical work not covered by certificates of compliance and apparently performed by unlicensed persons.

DEFINITIONS

electrical contractor licence

is a licence issued by the Electrical Safety Office authorising a person to conduct a business or undertaking that includes the performance of electrical work

electrical work licence

is a licence issued by the Electrical Safety Office authorising an individual to perform electrical work

electrical mechanic licence authorises the holder to perform all electrical work

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electrical work

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extra low voltage (ELV): means voltage of 50 Volts or less alternating current (a.c.) RMS or 120 V or less ripple-free direct current (d.c.)

low voltage (LV): means voltage greater than extra low voltage but not more than 1000 V a.c. RMS or 1500 V ripple-free d.c.

THE QUESTIONS

What are my responsibilities regarding electrical installations on ships?

Owners and masters, accredited persons and others involved with ships have general safety obligations under sections 40 and 41 of the *Transport Operations (Marine Safety) Act 1994* (Act) regarding the condition of ships, including the condition of the electrical installation.

The *Transport Operations (Marine Safety—Designing and Building Commercial Ships and Fishing Ships) Standard 2006*, made under the Act, provides guidance on complying with the general safety obligations imposed under the Act. This standard requires that a ship's electrical installation and electrical work onboard must comply with the provisions of the *Electrical Safety Act 2002* (ESA).

The ESA provides that a person must not perform or supervise electrical work unless the person is the holder of an electrical work licence. Also, a person must not conduct a business or undertaking that contracts for the performance of electrical work other than under a contract of employment unless the person is the holder of an electrical contractor licence. A licensed electrician must ensure that electrical work is in accordance with **Australian/New Zealand Standard 3000** known as the **wiring rules** (AS/NZS 3000).

How can I meet my responsibilities regarding the electrical installation on ships?

Complying with the electrical standards and ensuring that electrical work on ships is performed by a licensed electrician is a way for owners and other persons involved with ship's electrical systems to meet their general safety obligations.

Certificates of compliance issued by accredited ship designers and marine surveyors are required for first commercial or fishing ship registration and for any new electrical work.

What standards apply to electrical installations on ships?

Licensed electricians must ensure that electrical work is in accordance with the wiring rules.

Certain electrical installations may not be covered in detail by AS/NZS 3000 in regard to particular installation methods, materials, arrangements or circumstances of use. AS/NZS 3000 section 1.6 allows for alternative arrangements to accommodate electrical installations where cover by the wiring rules is incomplete. Alternative arrangements will be deemed suitable provided they satisfy the fundamental safety principles of section 1 of AS/NZS 3000 and will result in a degree of safety not less than that which would be achieved by compliance with AS/NZS 3000.

The **National Standard for Commercial Vessels – Part C Construction – Subsection 5B Electrical Edition 2** (NSCV C 5B Ed 2) was published by the National Marine Safety Committee on 1 December 2005. This standard was developed to promote greater reliance on AS/NZS 3000 Electrical Installations. NSCV C 5B Ed 2 provides additional requirements and variations to AS/NZS 3000 necessary to reflect the requirements of the marine industry and the particular environment on ships while satisfying the safety requirements of section 1 of AS/NZS 3000.

NSCV C 5B Ed 2 supersedes the first edition and the design and installation of electrical systems on new ships, and new work on existing ships, should comply with this new edition of the electrical subsection of the NSCV rather than, the now obsolescent, electrical part of

the USL Code.

Existing installations commenced prior to the introduction of NSCV C 5B Ed 2 may continue to be assessed under the USL Code electrical provisions provided safety is not compromised and no new work is involved.

Will the electrical installation on an imported ship comply?

Imported ships complying with IEC/ISO standards, classification society rules or other known standards will comply with the fundamental safety requirements of section 1 of AS/NZS 3000. However, compliance with section 1 of AS/NZS 3000 is mandatory and some issues of conflict between these other standards and AS/NZS 3000 or NSCV C 5B Ed 2, for example, cable colour codes in LV installations of American built ships, will require resolution on a case by case basis by Maritime Safety Queensland in consultation with the Electrical Safety Office before acceptance for compliance.

Any person selling an imported ship, including an import agent, must ensure that the electrical equipment on board complies with Queensland legislation. Prescribed electrical equipment includes such items as circuit breakers, switches, safety switches, refrigerators and microwave ovens. Information about the requirements for approval of electrical equipment and examples of identifying approval marks on electrical equipment is available on the Electrical Safety Office website.

Does a ship under 6 metre in length need to comply?

A ship under 6 metre in length of class 1F, 2C, 2D or 2E operating in smooth or partially smooth waters, or within 15 nautical miles from land, may be registered if the application is accompanied by a statement of positive flotation and a statement that the ship is suitable for its intended use. Owners, operators and accredited persons are reminded that the need for licensed electricians and the standards apply to LV electrical installations on all ships.

What about maintenance and repairs to the electrical installation on a ship?

Maintenance and repairs to LV electrical installations on ships is electrical work and may only be performed by a licensed electrician.

FURTHER INFORMATION

Marine safety legislation is available on the Maritime Safety Queensland website at www.msq.qld.gov.au.

Copies of the *Electrical Safety Act 2002*, the *Electrical Safety Regulation 2002*, *Codes of Practice* and other publications regarding obligations for electrical safety are available as downloads at the Electrical Safety Office website at www.eso.qld.gov.au or from:

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Level 6, Neville Bonner Building
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GPO Box 69
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Tel. 1300 362 320

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Australian Standards are available from SAI Global Ltd. SAI Global can be contacted by phone on 13 12 42, by email at sales@sai-global.com and their website is www.saiglobal.com.

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