



ABYC TE-30 July, 2009

**Electrical Division Standard
Electrical Project Technical
Committee**

The ABYC Standards and Technical Information Reports for Small Craft are the product of a consensus of representatives of government, industry and public sectors. It is intended solely as a guide to aid manufacturers and the marine community in the design, construction, equipage and maintenance of small craft.

ABYC reviews each standard at least every five years at which time it may be reaffirmed, revised, or withdrawn. ABYC welcomes any written comments on the Standards and Technical Information Reports.

ABYC TE-30

ELECTRIC PROPULSION SYSTEMS



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This list represents the membership at the time the Committee was balloted.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of ABYC or any document developed by the committee on which the member serves.

This Standard was developed under procedures accredited as meeting the criteria for American National Standards. The Project Technical Committee that approved the Standard was balanced to ensure that individuals from competent and concerned interests have had an opportunity to participate.

This Standard, which is the result of extended and careful consideration of available knowledge and experience on the subject, is intended to provide minimum performance requirements.

ABYC's Project Technical Committee meetings are open to the public. All inquiries regarding standards activity, interpretations, or meeting attendance should be directed to the ABYC Technical Department at comments@abycinc.org.

ABYC and its committees do not "approve", "certify", or "endorse" any item, construction, or proprietary device.

REQUEST FOR INTERPRETATIONS

Upon written request the Electrical PTC will render an interpretation of any requirement of the Standard. The request for interpretation should be clear and unambiguous. Requests should be presented to the PTC in a manner in which they may be answered in a yes or no fashion.

The committee reserves the right to reconsider any interpretation when or if additional information which might affect it becomes available to the PTC. Persons aggrieved by an interpretation may appeal to the Committee for reinterpretation.

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TE-30 ELECTRIC PROPULSION SYSTEMS

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TE-30 - ELECTRIC PROPULSION SYSTEMS

BACKGROUND

High-voltage electrical propulsion systems are becoming more common in the boating industry. System voltages over 50 VDC and 300 VAC typically may have harmful or lethal levels of electrical current. It is important to protect persons from exposure to these hazards.

ABYC E-11, *AC and DC Electrical Systems on Boats*, is limited to the design, construction and installation of direct current systems that operate at a potential of 50V or less and alternating current electrical systems operating at frequencies of 50 or 60 Hz and less than 300V ("extra low voltage"). Emerging technologies for system voltages and frequencies greater than those allowed by E-11 are increasing in use, especially for electrical propulsion systems. The standards used by other industries, such as automotive, and light rail have led to confusion regarding the propriety and applicability of these standards to the marine industry, especially in light of our unique environmental conditions.

This Technical Information Report is a compilation of the key safety requirements of commonly used national and international standards related to voltages and frequencies in excess of those covered by E-11, as well as recommendations for the design, construction, and installation of electrical systems and components used in high voltage electric propulsion systems.

INTENT

This technical information report addresses AC and DC electrical systems used on boat's alternating current (AC) systems operating at more than 300 VAC, but less than 1000 VAC, and direct current (DC) systems operating at more than 50 VDC but less than 1000 VDC, including battery banks, motors, and controllers for the purpose of propulsion.

REFERENCES

The following publications form a part of this report or are used in the creation of this report. Unless otherwise noted the latest version of referenced standards shall apply.

ABYC - American Boat & Yacht Council, Inc., 613 Third Street, Suite 10, Annapolis, MD 21403. Phone: 410-990-4460, Fax: 410-990-4466. Website: www.abycinc.org

[ABYC E-11, AC and DC Electrical Systems on Boats](#)
[ABYC P-23, Steering and Propulsion Controls for Jet Boats](#)
[ABYC P-27, Electric/Electronic Steering Control Systems](#)

NFPA – National Fire Protection Association, Referenced Orgs 1 Batterymarch Park, Quincy, Massachusetts 02169-7471 Phone: 617-770-3000 Fax: 617-770-0700
Website: www.nfpa.org

NFPA 70: National Electrical Code

IEEE Corporate Office 3 Park Avenue, 17th Floor New York, N.Y. 10016-5997 Phone: 212-419-7900
Fax: 212-752-4929

IEEE 45 Recommended Practice for Electric Installations on Shipboard

IEC – International Electrotechnical Commission, 3, rue de Varembe, PO Box 131, CH – 1211 GENEVA 20, Switzerland. Phone: +41 22 919 0211. Fax: +41 22 919 03 00. Website: www.iec.ch

IEC 60533 Electrical and Electronic Installations in Ships - Electromagnetic Compatibility
IEC 61000 Electromagnetic compatibility (EMC)

IEC 60945 Maritime Navigation and Radiocommunication Equipment and Systems - General Requirements - Methods of Testing and Required Test Results

SAE - Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096-0001. Phone: 724-776-4841. Fax: 724-776-5760. Website: www.sae.org.