

INTERNATIONAL STANDARD

**Mobile and fixed offshore units – Electrical installations –
Part 5: Mobile units**

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INTERNATIONAL STANDARD

**Mobile and fixed offshore units – Electrical installations –
Part 5: Mobile units**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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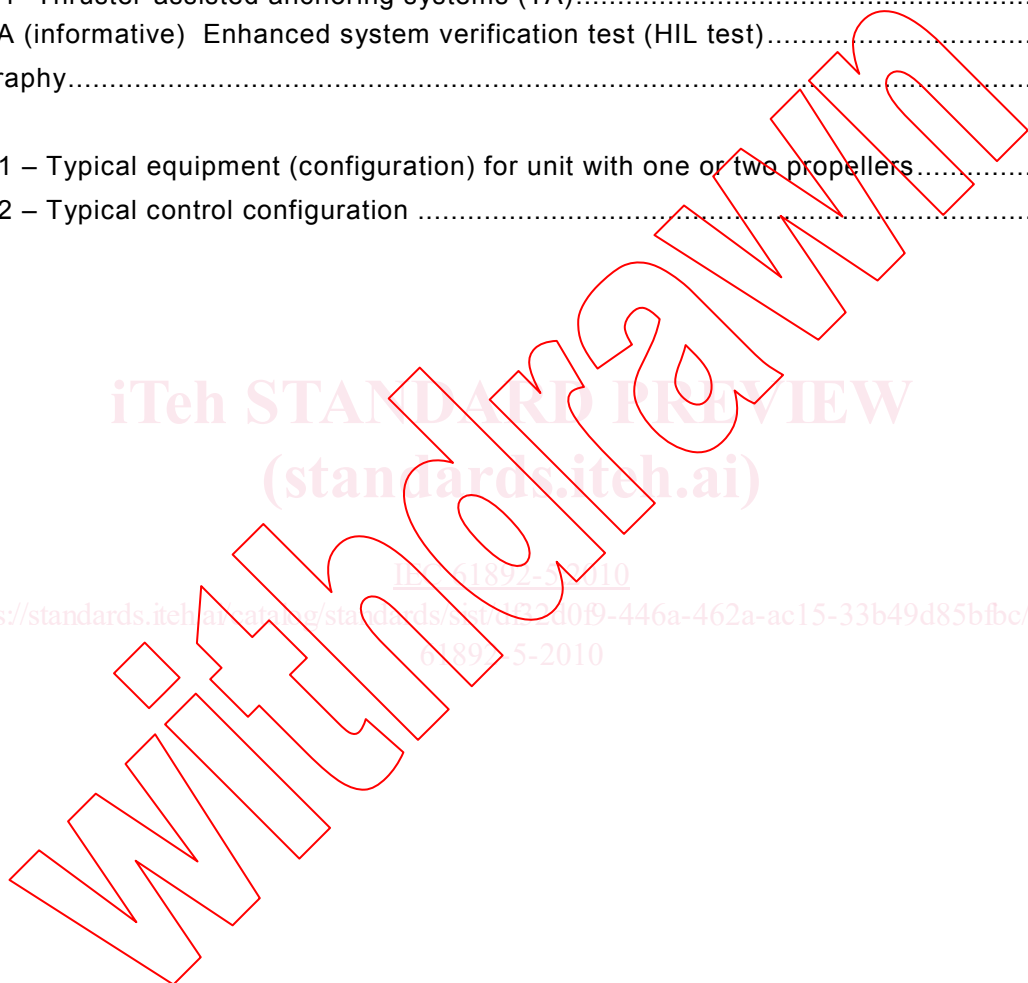
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MOBILE AND FIXED OFFSHORE UNITS –
ELECTRICAL INSTALLATIONS –****Part 5: Mobile units**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61892-5 has been prepared by IEC technical committee 18: Electrical installations of ships and of mobile and fixed offshore units.

This second edition cancels and replaces the first edition published in 2000. This edition constitutes a technical revision.

This second edition includes the following significant technical changes with respect to the previous edition:

- a) the requirement to d.c. generators has been deleted;
- b) the requirement to EMC has been rewritten;
- c) the requirement to power management system has been added;
- d) an informative annex regarding testing of DP systems has been added.

The text of this standard is based on the following documents:

FDIS	Report on voting
18/1167/FDIS	18/1177/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The requirements specified in this International Standard are based on the Code for the Construction and Equipment of Mobile Offshore Drilling Units (1989 MODU CODE) published by the International Maritime Organization (IMO), and might include additional provisions.

A list of all the parts in the IEC 61892 series, under the general title *Mobile and fixed offshore units – Electrical installations*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this standard may be issued at a later date.

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INTRODUCTION

IEC 61892 forms a series of International Standards intended to ensure safety in the design, selection, installation, maintenance and use of electrical equipment for the generation, storage, distribution and utilization of electrical energy for all purposes in offshore units used for exploration or exploitation of petroleum resources.

This standard is based on equipment and practices which are in current use, but it is not intended in any way to impede development of new or improved techniques.

The ultimate aim has been to produce a set of International Standards exclusively for the offshore petroleum industry.



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MOBILE AND FIXED OFFSHORE UNITS – ELECTRICAL INSTALLATIONS –

Part 5: Mobile units

1 Scope

This part of IEC 61892 specifies the characteristics for electrical installations in mobile units, for use during transfer from one location to another and for use during the exploration and exploitation of petroleum resources.

It applies to all installations, whether permanent, temporary, transportable or hand-held, to a.c. installations up to and including 35 000 V and d.c. installations up to and including 1500 V.(a.c. and d.c. voltages are nominal values).

NOTE Attention is drawn to further requirements concerning electrical installations on such mobile offshore units contained in the MODU CODE of the International Maritime Organization (IMO).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60034-1, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60034-6, *Rotating electrical machines – Part 6: Methods of cooling (IC Code)*

IEC 60076 (all parts), *Power transformers*

IEC 60092-501:2007, *Electrical installations in ships – Part 501 Special features – Electric propulsion plant*

IEC 60092-504, *Electrical installations in ships – Part 504 Special features – Control and instrumentation*

IEC 60332-1-2, *Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame*

IEC 60332-3-22, *Tests on electric cables under fire conditions – Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A*

IEC 61000-6-2:2005, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments*

IEC 61378-1, *Convertor transformers – Part 1: Transformers for industrial applications*

IEC 61892-1, *Mobile and fixed offshore units – Electrical installations – Part 1: General requirements and conditions*

IEC 61892-2, *Mobile and fixed offshore units – Electrical installations – Part 2: System design*

IEC 61892-3, *Mobile and fixed offshore units – Electrical installations – Part 3: Equipment*

IEC 61892-6, *Mobile and fixed offshore units – Electrical installations – Part 6: Installation*

IMO-110E, IMO-111F and IMO-113S, *International Convention for the Safety of Life at Sea (SOLAS)*

IMO *Guidelines for vessels with dynamic positioning systems – see IMO/MSC/Circ. 645, Annex, International Maritime Organization*

IMO 904E, *Convention on the International Regulations for Preventing Collisions at Sea, International Maritime Organization (COLREG)*

3 Terms and definitions

For the purposes of this document the terms and definitions given in IEC 61892-1, IEC 61892-2, IEC 61892-3, IEC 61892-6 and the following apply.

3.1

auxiliary steering gear

equipment, other than any part of the main steering gear, necessary to steer the unit in the event of failure of the main steering gear but not including the tiller, quadrant or components serving the same purpose

3.2

dynamic positioning (DP) system

equipment necessary to provide means of controlling the position and heading of a mobile unit within predetermined limits by means of resultant vectored thrust

3.3

electric steering gear

power operated steering gear where an electric motor applies torque to the rudder stock through mechanical means only

3.4

electrohydraulic steering gear

power operated steering gear where a hydraulic pump, driven by an electric motor, applies torque to the rudder stock through hydraulic and mechanical means

3.5

main steering gear

machinery, rudder actuators, steering gear power units and ancillary equipment and the means of applying torque to the rudder stock (for example tiller or quadrant) necessary for effecting movement of the rudder for the purpose of steering the unit under normal service conditions

3.6

petroleum

complex mixture of hydrocarbons that occurs in the earth in liquid or gaseous forms

3.7

propulsion machine (electric)

rotating machine normally intended to provide propulsive power

**3.8
redundancy**

in an item, the existence of more than one means for performing a required function [IEC 60050-191:1990, 191-15-01]

**3.9
semiconductor convertor**

an electronic power converter with semiconductor valve devices [IEC 60050-551:1998, 551-12-42]

**3.10
steering gear control system**

equipment by which orders are transmitted from the navigating bridge to the steering gear power units

NOTE Steering gear control systems comprise transmitters, receivers, hydraulic control pumps and their associated motors, motor controllers, piping and cables, etc.

**3.11
steering gear power unit (electric steering gear)**

electric motor and its associated electrical equipment used to operate the steering gear

**3.12
steering gear power unit (electrohydraulic steering gear)**

electric motor and its associated electrical equipment and connected pump used to operate the steering gear

4 General requirements

4.1 Protection against flooding

In every mobile unit in which electric power is used for the services necessary for the safety of the unit, the generators, switchgear, motors and associated control gear for such services, with the exception of machinery in the platform of semi-submersibles, shall be so situated or arranged that they continue to operate satisfactorily in the event of partial flooding by bilge water above the tank top in the space in which they are situated.

4.2 Rotating machines

Rotating machines shall be installed to minimise the effects of motion. The design of bearings of all machines and the arrangement for their lubrication shall be adequate to withstand the motions encountered in heavy weather and operation for prolonged periods at the list and trim specified in Clause 5 without the spillage of oil.

4.3 Conductors, equipment and apparatus

Conductors, equipment and apparatus shall be placed at such a distance from each magnetic compass or shall be so disposed that the interfering external magnetic field is negligible; that is, the total singular deviation shall not exceed 30 min when any combination of circuits is switched on and off.

4.4 Main switchboards

The main switchboard shall be subdivided into at least two parts. The subdivision may be effected by removable links, circuit-breakers or other suitable means so that the main generators and any supplies to duplicated services which are directly connected to the busbars are, as far as is practicable, equally divided between the sections.

4.5 Precautions against vibration and mechanical shock

Machines, equipment and apparatus shall be unaffected by vibration and shock likely to arise under normal service. Screws and nuts securing current-carrying parts shall be effectively locked so that they cannot work loose by vibration. The locking of screws and nuts securing noncurrent-carrying parts is recommended where necessary.

4.6 Axes of rotation

For units where the requirements to dynamic conditions, as specified in 5.5 apply, horizontal rotation machines shall to the extent possible be installed preferably with the shaft in the fore-and-aft direction. Where a machine is installed athwartship, it shall be ensured that the design of the bearings and the arrangements for lubrication are satisfactory to withstand the rolling specified in Clause 5. The manufacturer shall be informed when a machine for installation athwartship is ordered.

5 Limits of inclination of the unit

5.1 Authority requirement

Dependent upon the outcome of all studies relevant to the intact and damaged stability of the unit, the appropriate authority may require or permit deviations from the angles stated in 5.2, 5.3 and 5.4.

5.2 Machines, equipment and apparatus – General

All machines, equipment and apparatus shall operate satisfactorily under all conditions with the unit upright and when inclined up to the following angles from the normal:

- for column stabilized units, 15° in any direction;
- for self-elevating units, 10° in any direction;
- for surface units, 15° either way in list and simultaneously trimmed 5° by the bow or stern.

5.3 Propulsion machinery

Main propulsion machinery and all auxiliary machinery essential to the propulsion and safety of the mobile unit shall be capable of operating under the static conditions specified in 5.2 and the following dynamic conditions:

- for column stabilized units, 22° 30' in any direction;
- for self-elevating units, 15° in any direction;
- for surface units, 22° 30' rolling and simultaneously pitching 7° 30' by the bow or stern.

5.4 Emergency machinery

Emergency machines, equipment and apparatus fitted in accordance with requirements from the appropriate authority for emergency plant shall operate satisfactorily under all conditions with the unit upright and when inclined up to the following maximum angles from the normal:

- for column stabilized units, 25° in any direction;
- for self-elevating units, 15° in any direction;
- for surface units, 22° 30' about the longitudinal axis and/or when inclined 10° about the transverse axis.

5.5 Dynamic condition

Where required by the appropriate authority, dynamic condition limits shall apply as follows: