

TC 18 - ELECTRICAL INSTALLATIONS OF SHIPS AND OF MOBILE AND FIXED OFFSHORE UNITS and SC18A CABLES AND CABLE INSTALLATIONS

IEC (International Electrotechnical Commission)

TC18 (Technical Committee 18)

SC18A (sub committee 18A)

NOTE: The following presentation is an extract from SMB/3248/R
"STRATEGIC POLICY STATEMENT" for TC18 and SC18A

Mario Dona

TC31 liaison with TC18 / MT18
February 2009

IEC
SMB/3248/R
STRATEGIC POLICY STATEMENT

IEC/TC or SC	Secretariat	Date
TC18 and SC18A	NORWAY and FRANCE	2006-03-27

TC 18 - ELECTRICAL INSTALLATIONS OF SHIPS AND OF MOBILE AND FIXED OFFSHORE UNITS and SC18A CABLES AND CABLE INSTALLATIONS

A: Background

Date of establishment: TC18 - 1927.

- The IEC Committee of Action, during its meeting in Bellagio in 1927, decided to nominate a specific Advisory Committee to study the questions relating to the standardization of electrical installations in ships.
- This decision was taken as a result of a proposal made by the Netherlands National committee to undertake the said study. The British National committee was asked to act as Secretary and the President was authorized to designate the National Committees to be invited to take part in the work.
- The complete history of TC18 up to its 60th. Anniversary is recorded in a book entitled "TC18 1935 to 1995 60 Years" written by Mr Kees Donkervoort and presented to the Committee at its Plenary meeting in Stockholm in 1996.

Scope

- “To prepare standards for electrical installations of ships and of mobile and fixed offshore units, incorporating good practice and co-ordinating as far as possible existing regulations and IEC Publications.
- The standards will form a code of practical interpretation and amplification of the requirements of the International Convention on Safety of Life at Sea, a guide for future regulations may be prepared by Administrations, and a statement of practice for use by builders and appropriate organizations.
- The standards will chiefly concern:
 - a) factors promoting the safety of ships and of mobile and fixed offshore units;
 - b) factors promoting safety of life.
- The standards will foster inter-changeability of parts and ease of procuring equipment by indicating standards of ratings, types, dimensions, quality, test methods, etc., whether or not these are influenced by regulations, and will thus facilitate interchanges between purchaser and supplier.”
- The scope has been proposed to be changed according to the decisions taken in the TC18 meeting in Delft 2005 and to include the scope and mandate of SC18A.

TC18 Current Maintenance Teams and Working groups

- MT1 Maintenance of IEC 60092-101, -201, -202, -204, -401 and IEC 61363
- MT2 Maintenance of IEC 60092-301, -303, -304, -305, -306 and -307
- MT3 Maintenance of IEC 60092-502 and -506
- MT4 SOLAS (Safety of Life at Sea). MT4 inform all MT on relevant IMO changes was disbanded. To be covered by the other MTs.
- MT16 Maintenance of IEC 60092-504 to be disbanded.
- MT18 Maintenance of IEC 61892-1, -2, -3, -5, -6, and -7. PT in developing the IEC 61892-4.
- MT21 Maintenance IEC 60533.
- MT22 Maintenance of IEC 60092-507.
- MT24 Maintenance of IEC 60092-501 and -503, Part 503 in maintenance and to be followed up by MT1.
- MT25 Maintenance of IEC 60092-302 and -508 to be disbanded. Technical contents to be covered by MT2.
- The MTs was rearranged based upon the proposal from the Ad Hoc Group for Rearrangement without any technical changes into a more simple form of the IEC 60092-series (PT3) set up at the TC18 meeting in Firenze 2001.

TC18 future Maintenance Teams will be as follows:

- MT1 Maintenance of the Part 1 Section 1 of the general standard IEC 60092-1.
- MT2 Maintenance of Part 1 Section 2 of the general standard of IEC 60092-1.
- MT3 Maintenance of IEC 60092-502/-506
- MT18 Maintenance of IEC 61892-1/61892-3/-61892-5/-61892-6/-61892-7
- MT21 Maintenance IEC 60533
- MT22 Maintenance of IEC 60092-507
- MT24 Maintenance of IEC 60092-501/60092-503.

Subcommittee 18A: CABLES AND CABLE INSTALLATIONS

- Terms of reference of SC18A
- Within the scope of TC18, to prepare standards for electric cables and their installations.

SC18A Current and future Maintenance Teams and Working groups

- MT 1 Maintenance of IEC 60092-350, -351, -352 and -359
- MT 2 Maintenance of IEC 60092-353, -354, -373, -374, -375, -376, -377 and -390

Number of publications Issued (Current)

- TC18 26
- SC18A 11

Number of Projects in Development.

	Maintenance	New
• TC18	8	1
• SC18A	2	0

• List of participating "P" members

- **TC18** 20 members include Canada; China; Denmark; Finland; France; Germany; Italy; Japan; Netherlands; Norway; Poland; Portugal; Romania; Russian Federation; Sweden; USA; UK; Yugoslavia and Korea.
- **SC18A** 19 members as TC18 above with the addition of Spain.

Liaisons and Dependencies

- IEC/ TC17 Switchgear and control gear
- IEC/SC31J Classification of hazardous areas and installation requirements
- IEC/TC64 Electrical installations and protection against electric shock
- IEC/TC77 Electromagnetic compatibility
- IEC/TC80 Maritime Navigation and Radio communication Equipment/Systems.
- ISO/TC8 Ships and Marine Technology.
- ISO/TC67 Materials, Equipment and Offshore Structures for Petroleum and Natural Gas Industries.
- ISO/TC188 Small Craft.
- IMO International Maritime Organization.
- IACS International Association of Classification Societies (IACS/EL).
- IEEE/IMIC Institution of Electrical and Electronic Engineers/International Marine Industry Committee

B: Environment

B1 Business environment

Ships

- Currently the most important technical developments in the shipbuilding industry relate to the increasing extensive use of computer hardware and software control and monitoring systems resulting in distributed machinery control. The introduction of additional and more sophisticated passenger/crew safety systems including addressable fire alarm and low level lighting systems, also passenger and crew address systems.
- For this reasons, fire performances as Fire Retardancy, Fire resistance, Low smoke, No corrosivity, Halogen free materials are more requested.
- There is a growing awareness of the effects of electromagnetic interference and much discussion and effort is going into the development of comprehensive EMC standards.
- The industry is experiencing a return to electric propulsion systems which has resulted from the development of power electronics. A move to variable speed auxiliary drives is also being seen for the same reasons.
- As the electrical power requirements of modern ships continues to increase there is a trend to higher operating voltages for power consumers, propulsion and machinery auxiliaries.
- In economic terms the investment in the electrical equipment and installation on new ships continues to increase as a percentage on the overall value of the vessel.
- Ship owners, Builders, Insurers and other Authorities are interested in consistent standards for electrical installations and shipboard cables, IEC 60092 series of standards satisfies this requirement.
- The philosophy applied above to the requirements for ships is equally applicable to the offshore Industries and therefore TC18 is striving to complete IEC 61892 which is a seven part standard specifically for the international offshore industry.
- It should be noted that TC18 has established a formal relationship with the IMO with the scope to collaborate with this Organization in the field of electrical systems on board of ships and offshore units.

B: Environment - continued

B.2 Market demand

- The IEC 60092 series of standards for which TC18 is responsible is referenced in the IMO – Safety of Life at Sea Convention (SOLAS).
- SOLAS is applicable to all commercial seagoing ships of 500 gross tonnes and above, thus the standards are used extensively internationally. For commercial ships below this level the mandatory requirements for electrical installation is usually set by the National Flag State Authority where the ship is registered. Many such Authorities world-wide rely on the IEC 60092 standards in preference to developing their own standards.
- The IEC 60092 series of Standards are employed world-wide by ship owners, ship builders/repairers, Underwriters, Lawyers and Statutory Authorities.
- The TC and SC have representation from most of the industries and Authorities that it serves.
- Obtaining participation on the committee and working groups is not easy.
- As stated above the Standards often replace the Statutory Authority documents which are the only competing documents.
- As technology continues to advance there will remain a need for the TC/SC to produce new standards and to maintain the existing ones.

B: Environment - continued

B.3 Trends in technology and trade

Shipping

- The trends in shipping are to a continuance of the current ship types coupled with the introduction of larger container and passenger ships, the introduction of High speed vessels of a variety of types and sizes with the accompanying requirements for reduction in weight of all installed machinery and systems including the electrical installation.
- The increase in the size of vessels and of the installed electrical load in leading to the use of higher voltage systems. The return to electric propulsion systems coupled with the advances in solid state power devices and the need for variable speed auxiliary drives has lead to more strict control of EMC which is reflected in the extensive updating of the TC's EMC standard.
- SC18A is developing a new standard (Guidance on the selection of cables for telecommunications and data transfer including radio-frequency cables) including fibre optic cables.

Offshore Units

- Most of the technical comments above apply equally to offshore units including the requirements of SOLAS in respect of some mobile units.
- At the request of the offshore industries of many countries, work commenced many years ago on a system standard for offshore units. The work is now proceeding at a fast pace.
- TC18 is developing a seven part standard - IEC 61892, Part 1, Part 2, Part 3, Part 5, Part 6 and Part 7 are published. Part 4 is under development (CDV-stage).
- SC18A is merging IEC 60092-351 and -359 in including Mud resistant material for sheathing.

B: Environment - continued

B.4 Ecological environment

- TC18 is primarily concerned with the installation of electrical equipment, the ultimate disposal of the installation on board the ship or offshore unit is beyond the scope of the committee.
- SC18A is primary concerned with the manufacturing and installation of shipboard cables equipment.
- However, the committees is conscious of the need to protect the environment and thus strive to ensure that the materials employed in the installations are ecologically friendly and cause the minimum of pollution possible.

C: Work Programme

C.1 Current work

TC18 Priorities

- The priorities for TC18 are to maintain the IEC 60092 suite of standards up to date and to complete the current work as early as possible.
- The main new work agreed is to develop a general standard, IEC 60092-1, for electrical installations in ships. The maintenance of the standards involved in IEC 60092-1 continues according to the approved maintenance cycles.

SC18A Priorities

- Review of IEC 60092-350 and -353.
- New standard for cables for telecommunications and data transfer including radio-frequency.
- Merge IEC 60092-351 and -359

C: Work Programme - continued

C.2 Resources/infrastructure needed

- TC18 currently has reduced the number of MTs from 10 to 7, see item A above. Its Sub Committee SC18A has one MT by the merging their two MTs onto a single MT2.

See section E for proposed maintenance plan

C.3 Safety aspects

(only for committees which do not have a reference to safety in their scope)

D: Future Work

- To complete the current work load, deal with the items referred to in the priorities stated above and to ensure that the IEC 60092 suite, 61892 suite and other standards the TC18 is responsible for are kept up to date as indicated in the maintenance plan. The committee will also review the developing technologies relating to the industries served and ensure that their needs are served. When new work is proposed or a need is identified the committee will react as necessary.

E: Maintenance cycle

Publication No	Date of publication	Review Date	Maintenance result due	Responsibility (Maintenance Team)
TC 18 Maintenance				
IEC 60092-501 Ed 4.0	1984-09	2002	2006	MT24
IEC 60092-503 Ed 1	1975-01	2002	2006	MT24
IEC 60092-504 Ed 4.0	2005-03	2005	2006	MT16
IEC 60092-507 Ed 2.0	2000-02	2003	2006	MT22
IEC 61892-3 Ed 1	1999-02	2002	2006	MT18
IEC 61892-5 Ed 1	2000-08	2003	2006	MT18
IEC 61892-6 Ed 1	1999-02	2002	2006	MT18
IEC 61892-7 Ed 1	1997-05	2002	2006	MT18
SC 18A Maintenance				
IEC 60092-350 Ed 2	2001-06	2005	2006	MT2
IEC 60092-370 TS	New			PT

Appendix – Reference Standards

IEC 60092-101	Electrical installation in ships. Definitions and General requirements
IEC 60092-201	Electrical installation in ships. System Design - General
IEC 60092-202	Electrical installation in ships. System Design - Protection
IEC 60092-204	Electrical installation in ships. Electric & electro-hydraulic steering gear
IEC 60092-301	Electrical installation in ships. Generators & Motors
IEC 60092-302	Electrical installation in ships. Low voltage switchgear & control gear
IEC 60092-303	Electrical installation in ships. Transformers for power & lighting
IEC 60092-304	Electrical installation in ships. Equipment. Semiconductor convertors
IEC 60092-305	Electrical installation in ships. Equipment. Accumulator batteries
IEC 60092-306	Electrical installation in ships. Equipment. Luminaires and accessories
IEC 60092-307	Electrical installation in ships. Equipment. Heating & cooling appliances
IEC 60092-350	Electrical installation in ships. General construction & test methods of power, control & instrumentation cables

Appendix – Reference Standards

IEC 60092-351	Electrical installation in ships. Insulating materials for shipboard & offshore units – power, control, instrumentation, telecom & data cables
IEC 60092-352	Electrical installation in ships. Choice and installation of electrical cables
IEC 60092-353	Electrical installation in ships. Single & multicore non radial field cables
IEC 60092-354	Electrical installation in ships. Single & 3 core power cables – 6kV/30kV
IEC 60092-359	Electrical installation in ships. Sheathing materials for shipboard power & telecommunication cables.
IEC 60092-370	Electrical installation in ships & of mobile & fixed offshore units. Guidance on selection of cables
IEC 60092-373	Electrical installation in ships. Shipboard telecommunication & radio frequency cables.
IEC 60092-374	Electrical installation in ships. Shipboard telephone cables for non essential services
IEC 60092-375	Electrical installation in ships. Shipboard telecommunication & radio frequency cables, general instrumentation etc
IEC 60092-376	Electrical installation in ships. Cables for control & instrumentation circuits - 150/250V
IEC 60092-377	Electrical installation in ships. 150/250V screen cables for instrumentation and control

Appendix – Reference Standards

IEC 60092-390	Electrical installation in ships. Cable penetrations – Fire type test procedure
IEC 60092-401	Electrical installation in ships. Installation & test of complete installation
IEC 60092-501	Electrical installation in ships. Special features. Electric propulsion plant
IEC 60092-502	Electrical installation in ships. Tankers. Special features.
IEC 60092-503	Electrical installation in ships. Special features. AC supply systems – Voltage range 1kV to 11kV
IEC 60092-504	Electrical installation in ships. Special features. Control & Instrumentation
IEC 60092-506	Electrical installation in ships. Special features. Ships carrying specific dangerous goods and materials hazardous only in bulk
IEC 60092-507	Electrical installation in ships. Pleasure craft
IEC 60092-508	Electrical installation in ships. Switchgear and control gear – 1kV to 11kV
IEC 60533	Electrical & Electronic installations in ships. Electromagnetic compatibility

Appendix – Reference Standards

IEC 612892-1	Mobile & Fixed offshore units. Electrical installations. General requirements and conditions
IEC 612892-2	Mobile & Fixed offshore units. Electrical installations. System Design
IEC 612892-3	Mobile & Fixed offshore units. Electrical installations. Equipment
IEC 612892-4	Mobile & Fixed offshore units. Electrical installations. Cables
IEC 612892-5	Mobile & Fixed offshore units. Electrical installations. Mobile Units
IEC 612892-6	Mobile & Fixed offshore units. Electrical installations. Installation
IEC 612892-7	Mobile & Fixed offshore units. Electrical installations. Hazardous Areas