GÜNLÜ EVRAK

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Konu : Uluslararası Sefer Yapan Gemilerin Limanlarda Sahil Elektrik Bağlantılarındaki Emniyetli Uygulamalar Yönergeleri Hk

Sirküler No :860

SAYIN ÜYEMİZ,

İlgi : Uluslararası Deniz Ticaret Odasının (ICS) 03/12/2019 tarihli ve MC(19)98 sayılı yazısı.

Uluslararası Deniz Ticaret Odası (ICS) tarafından gönderilen ilgi yazıda, IMO Gemi Sistemleri ve Ekipmanları Alt Komitesine (Ship Systems and Equipment-SSE) sunulmak üzere hazırlanmış "Uluslararası Sefer Yapan Gemilerin Limanlarda Sahil Elektrik Bağlantılarındaki Emniyetli Uygulamalar Yönergeleri" raporuna yönelik ICS bildirimi Ek'te sunulmaktadır.

Söz konusu yorum raporu hakkındaki görüş ve önerilerinizin ICS'e iletilmek üzere 16 Aralık 2019 tarihi mesai bitimine kadar Odamıza (iletisim@denizticaretodasi.org.tr) gönderilmesi hususunda bilgilerinizi ve gereğini arz rica ederim.

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3 December 2019 **MC(19)98**

To: MARINE COMMITTEE

Copy: Environment Sub-Committee
Construction & Equipment Sub-Committee
All Full and Associate Members (for information)

DRAFT COMMENTING SUBMISSION TO SSE 7 COMMENTING ON THE REPORT OF THE CORRESPONDENCE GROUP ON THE DEVELOPMENT OF GUIDELINES ON SAFE OPERATION OF ONSHORE POWER SUPPLY (OPS).

Action required: Members are invited to review the attached draft submission for SSE 7 which comments on the report of the Correspondence Group on the Development of guidelines on safe operation of onshore power supply (OPS) service in port for ships engaged on international voyages (document SSE 7/11). Members are invited to submit comments and their support (or otherwise) for the draft document to the undersigned, not later than Tuesday 17 December.

Members will be recall that SSE 6 re-established the correspondence group which had been developing guidelines for safe operation of onshore power supply (OPS) systems. ICS has participated in the work of the correspondence group, the report of which is attached at **Annex A**. Given the increasing member State interest in OPS, including mandating its use in the case of China (ICS circular MC19(65)), the Secretariat considers that IMO guidelines which provide uniform global guidelines for safe operation of OPS would greatly assist industry.

During the work of the correspondence group certain members of the group considered that the decision of SSE 6 to develop operational guidelines should preclude references to technical standards, in particular IEC/IEEE 80005-1:2019, and have further called for a number of important sections of the draft guidelines to be deleted on the basis that equivalent guidance is provided in IEC/IEEE 80005-1:2019. Notwithstanding the apparent contradiction in both calling for all references to IEC/IEEE 80005-1:2019 to be

deleted whilst simultaneously calling for sections of the draft guidelines to be deleted where they address matters included within the IEC standard, the Secretariat does not agree that the decision to develop operational guidelines precludes references to technical standards. If they are to be fit for their intended purpose and useful to industry, it is considered that guidelines for safe operation of electrical systems, especially high voltage (HV) electrical systems need to reference applicable technical standards and technical aspects which are an inherent and indivisible element of safe operation. Also, given the inherent heightened risks where two safe systems of work interact to manage cross boundary safety precautions (i.e. the safety management systems of the ship and of the port/terminal), a global regulatory framework to manage this interface in the form of IMO guidelines would be highly beneficial.

The Secretariat has therefore prepared a commenting document, which is attached at **Annex B**. Members are therefore invited to review the draft commenting document and provide any comments along with their support (or otherwise) for the submission to the undersigned (john.bradshaw@ics-shipping.org) by **Tuesday 17 December 2019**.

John Bradshaw
Technical Director

Attachments:
Annex A – Report of the Correspondence Group on the Development of guidelines on safe operation of onshore power supply (OPS) service in port for ships engaged on international voyages
Annex B – Comments on the report of the Correspondence Group

INTERNATIONAL MARITIME ORGANIZATION

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SUB-COMMITTEE ON SHIP SYSTEMS AND EQUIPMENT
7th session
Agenda item 11

SSE 7/11
27 November 2019
Original: ENGLISH
Pre-session public release: ☒

DEVELOPMENT OF GUIDELINES FOR COLD IRONING OF SHIPS AND CONSIDERATION OF AMENDMENTS TO SOLAS CHAPTERS II-1 AND II-2

Report of the Correspondence Group

Submitted by China

SUMMARY

Executive summary:	This document provides the report of the Correspondence Group on the Development of guidelines on safe operation of onshore power supply (OPS) service in port for ships engaged on international voyages
Strategic Direction, if applicable:	2
Output:	2.8
Action to be taken:	Paragraph 18
Related documents:	MSC 98/20/7; SSE 5/13, SSE 5/13/1, SSE 5/13/2, SSE 5/17, SSE 5/WP.7; SSE 6/11, SSE 6/WP.7 and SSE 6/18

General

1 In consideration of document MSC 98/20/7 (China) at MSC 98, the Committee agreed to include a new output in the 2018-2019 biennial agenda and the provisional agenda for the Sub-Committee on Ship Systems and Equipment (SSE) 5 on "Development of guidelines for cold ironing of ships and of amendments to SOLAS chapters II-1 and II-2, if necessary" (MSC 98/23, paragraph 20.36).

2 Having considered the documents submitted by interested Member States and recommendations of the Drafting Group, SSE 6 agreed to re-establish the Correspondence Group on the Development of guidelines on safe operation of onshore power supply service in port for ships engaged on international voyages (the draft Guidelines) for further consideration and discussion under the coordination of China (SSE 6/18, paragraph 11.11).

List of participants

3 Representatives of the following Member States participated in the Group:

CANADA
CHINA
GERMANY
JAPAN
NORWAY
REPUBLIC OF KOREA
SINGAPORE
SWEDEN
TURKEY
UNITED KINGDOM
UNITED STATES

a representative from the following Associate Member of IMO:

HONG KONG, CHINA

and the following non-governmental organizations in consultative status:

INTERNATIONAL CHAMBER OF SHIPPING (ICS)
CRUISE LINES INTERNATIONAL ASSOCIATION (CLIA)
INTERNATIONAL HARBOUR MASTERS' ASSOCIATION (IHMA)
INTERNATIONAL TRANSPORT WORKERS' FEDERATION (ITF)

Sincere appreciation is extended to the participants' contribution and cooperation.

Terms of reference

4 The Correspondence Group was instructed, taking into account the comments made and decisions taken at SSE 6 (SSE 6/18, paragraph 11.11), to:

.1 further develop the draft Guidelines on safe operation of onshore power supply (OPS) service in port for ships engaged on international voyages, limited to operational requirements, based on the draft text set out in the annex to document SSE 6/11, taking into account document SSE 6/11/1; and

.2 submit a report to SSE 7.

Progress made on the development of the Guidelines

5 Based on the draft Guidelines (SSE 6/11) and comments made by participants, the Group improved the draft Guidelines after three rounds of discussions.

6 In compliance with the instructions from SSE 6, the draft Guidelines was further developed limited to operational requirements and the Group further refined the structure of the draft Guidelines.

7 Paragraph 1.2.1.2 was deleted after discussion because IEC/IEEE 80005-2:2016 was a technical standard of data communication for monitoring and control, instead of a necessary reference to OPS operation.

8 Considering that the OPS connection should not be allowed when the OPS system was incompatible between ship-side and shore-side, and the safe operation of OPS connection was the main goal of the Guidelines, paragraph 4.3.4 was deleted after discussion.

9 The Group considered that the equipment related to OPS system layout listed in annex 1 to the draft Guidelines was not of universal nature and given that universal adaptability was the ultimate goal of the development of the Guidelines, annex 1 and paragraph 1.2.2 were deleted after discussion.

10 Annex 2 "OPS communication form" was divided into two parts, i.e. "OPS communication" (Checklist prior to arrival) and "OPS communication" (Checklist before Connection).

11 The Group agreed that the personnel qualification should be submitted to the Sub-Committee on Human Element, Training and Watchkeeping (HTW) for further discussion.

Issues to be further considered

12 Some participants suggested to delete IEC/IEEE 80005-1:2019, as it was a technical standard and the Guidelines was limited to operational requirements of OPS. Other members believed that the standard should be retained because it was an important reference for the safe operation of OPS. Considering that the Group has not reached a consensus, further discussion is needed on this matter.

13 Some participants suggested to delete "Section 2 Verification and Testing", as it was performed before the OPS connection and had been covered by IEC/IEEE 80005-1:2019, while other participants preferred to retain this section, for it was an integral part of OPS connection operation, which made the Guidelines more coherent and easy to apply. Considering that the Group has not reached a consensus, further discussion needs to be continued.

14 Some participants suggested to delete paragraphs 3.2.1.3 to 3.3.8 in "Section 3 Operation", however, other participants considered that those regulations were direct provisions relating to the safe operation of OPS and should be retained. Considering that the Group has not reached a consensus, further discussion needs to be continued.

15 Some participants suggested that the operation procedure of the low-voltage and high-voltage shore connection system in "Section 3 Operation" should be consistent. Other participants believed that the operation of high-voltage shore connection system should be different from that of low-voltage shore connection system. Considering that the Group has not reached a consensus, further discussion would be required.

16 Some participants suggested to delete the "Operation Flow Chart for OPS Connection" in annex 3 to the draft Guidelines, as such information should be included in more detail in the OPS manual. Whereas other participants recommended retaining the flow chart which provided a visual summary of the safe operation of OPS connection. Considering that the Group has not reached a consensus on this matter, further deliberation would be necessary.

17 More information on the progress made and pending issues are contained in the annex to this document.

Action requested of the Sub-Committee

18 The Sub-Committee is invited to:

.1 note the progress made on development of the Guidelines; and

.2 establish an experts' group at this session for further discussion on the issues above, as approved by MSC 101 (MSC 101/24, paragraph 14.27), with a view to finalization of the work item.

***

ANNEX

DRAFT GUIDELINES ON SAFE OPERATION OF ON-SHORE POWER SUPPLY (OPS) SERVICE IN PORT FOR SHIPS ENGAGED ON INTERNATIONAL VOYAGES

Introduction

With increasing requirements on marine environmental protection, the application of onboard clean energy solutions has been continuously promoted. The Paris Agreement has set arrangements for global response to climate change after 2020, in line with which, many States have developed specific implementation plans.

IMO has always focused on ship energy conservation and emission reduction. The application of on-shore power supply (OPS) (alternative maritime power (AMP), cold ironing, shore-side electricity and on-shore power supply, high or low voltage shore connection, respectively) is gradually expanding. These Guidelines have been developed to promote safe operation of OPS service in port on ships.

Taking into account that the OPS system in port for vessels are installed and applied internationally and recognizing that a safe operation of the OPS system requires special consideration, the Guidelines have been developed to facilitate both ship and shore side.

The Guidelines are not intended to prohibit other measures of onboard clean energy application.

1 General

1.1 Application

1.1.1 This document is intended to provide Guidelines ~~have been developed to provide an international operational standard~~ for the safe operation of OPS service in port on ships engaged on international voyage. For tankers the provisions in these Guidelines may be specially considered. The Guidelines do not apply to the electrical power supply during docking periods, e.g. dry docking and other out of service maintenance and repair.

1.2~~3~~ Terms and definitions

1.2~~3~~.1 *On-shore power supply (OPS) system* is the equipment that supplies on-shore power to ships berthing in port, including ship-side installations and shore installations.

1.2~~3~~.2 *Ship-side installations* are those onboard systems that are designed to accept shore power, typically involving incoming power receptacles and plugs, shore connection switchgear, and protections, transformer (if applicable), incoming switchgear and protections at the main switchboard, power cables (herein refer to as cables), automation, cable monitoring system and associated instrumentation.

1.2~~3~~.3 *Shore installations* is the equipment that is installed at quay or port for OPS, typically involving switchgear and protections, transformers, frequency convertors (if applicable), output power receptacles and plugs, ~~cables~~ cable management and associated instrumentation.

1.2~~3~~.4 *Cable management system* is all the equipment designed to control, monitor and handle the flexible and control cables and their connection devices.

1.2~~3~~.5 *High voltage (HV)* is nominal voltage in range above 1,000 V AC and up to and including 15 kV AC.

1.2~~3~~.6 *Low voltage (LV)* is nominal voltage up to and including 1,000 V AC.

1.2~~3~~.7 *Emergency shutdown* is manual and/or automatic shutdown in critical situations. The shutdown initiated when the ship moves past the maximum range of allowable motion up/down forward, aft or outward from the dock and which initiates OPS disconnection on shore.

1.2~~3~~.8 *The first connection* refers to the OPS connection on ship's first call at a shore supply point.

1.2~~3~~.9 Operation includes all activities necessary to permit the electrical installation to function. These activities include matters as switching, controlling, monitoring and maintenance as well as both electrical and non-electrical work.

1.2~~3~~ **General**

[1.2~~3~~.1 Technical requirements for the OPS system are based on following standard or other equivalent standards:

.1 IEC/IEEE 80005-1:2019: Utility connections in port – Part 1: High Voltage Shore Connection (HVSC) Systems – General requirements;]

~~.2 IEC/IEEE 80005-2:2016: Utility connections in port — Part 2: High and low-voltage shore connection systems – Data communication for monitoring and control.~~

~~1.2.2 Example for a general OPS system layout can be found in annex 1.~~

1.2.~~3~~2 The safety of ships, personnel and power supply systems should be ensured by the shore-side and the ship-side during the establishment of a connection of the ship supply, during all operations, in the event of a failure, during disconnection and when the systems are not in use.

1.2.~~4~~3 A compatibility assessment of the OPS system should be available (see IEC/IEEE 80005-1 and flow chart 21 in annex ~~3~~2) to verify the possibility of connecting the ship electrical system to the shore~~'s~~ installations.

1.2.~~5~~4 An equipotential bonding between the ship~~'s~~ hull and shore grounding electrode should be established ~~before the OPS connection~~.

1.2.~~6~~5 Both shore and ship sides should verify the design features of the OPS system and complete an OPS communication form (see annex ~~2~~1) prior to the ship's arrival and connection at a shore supply point.

1.2.~~7~~6 Communication

.1 a voice communication link, e.g. communication devices or other equivalents, should be provided to facilitate the communication between the operational personnel from the shore and ship side ; and

.2 a data communication link ~~has already been established~~ if provided between shore and ship-side installations, the link should be reliable.

[2 Verification and testing

2.1 Tests at the first call at a shore supply point:

~~.1 both shore and ship sides should cross review the initial tests reports before the tests at the first call at a shore supply point. The initial tests should meet IEC/ISO/IEEE 80005-1 requirements; and~~

.~~2~~ the following ~~tests~~ should be performed as an integration test by shore and ship-sides before the OPS connection:

.1 visual inspection;

.2 power frequency test for switchgear assemblies and voltage test for cable;

.3 insulation resistance measurement;

.4 measurement of the grounding resistance;

.5 secondary function test of the protection devices;

.6 function test of the interlocking system;

.7 function test of the control equipment;

.8 equipotential monitoring test;

.9 phase-sequence test;

.10 function test of the cable over tension alarm system;

.11 integration tests to demonstrate that the shore and ship-side installations work properly together; and

.12 function test of the emergency stops.

The tests in paragraphs 2.1.~~2.~~2 to 2.1.~~2.~~4 should be performed only if either of the installations, shore or ship-side, has been out of service or not in use for more than 30 months.

There should be a suitable cross boundary safety system that is jointly controlled by the ship and shore persons in charge (PIC). This should include appropriate procedures for ensuring the integrity of any isolations, such as a "lock out/tag out" system.

2.2 Tests at repeated calls of a shore supply point:

. 1 If the time between port calls (the same shore supply point) does not exceed 12 months and if no modifications have been performed either on the shore or ship-side installations, or both, the following verification should be conducted:

.1 visual inspection;

.2 confirmation that no earth fault is present;

.3 statement of voltage and frequency;

.4 an authorized switching and connection procedure;

.5 function test of the cable over tension alarm system; and

.6 function test of the emergency stops;

There should be a suitable cross boundary safety system that is jointly controlled by the ship-side and shore-side PIC. This should include appropriate procedures for ensuring the integrity of any isolations, such as a "lock out/tag out" system; and

.2 If the time between port calls (the same shore supply point) exceed 12 months then the tests in paragraph 2.1.1 to 2.1.12 ~~2.1.2.1, 2.2.1.5, 2.1.2.6, 2.1.2.10, and 2.1.2.12~~ should be conducted.]

3 Operation

3.1 Personal protective equipment

Personnel working on handling, connection and operation of OPS systems should wear the personal protective equipment (PPE) as required by national regulations (shore side) or by the ISM Code (ship side).

[3.2 High Voltage (HV)

3.2.1 Connection

3.2.1.1 Both shore and ship sides should specify responsibilities and assignments.

3.2.1.2 Shore power transfer via parallel and via a blackout connection should follow the flow chart 2 and chart 3 in Annex ~~3~~2, respectively. The detailed procedures include:

.1 a safety inspection, which in turn should include:

.1 the identification of access to restricted areas;

.2 a verification of the locations of the communication devices, i.e. walkie-talkie and telephone, fire-fighting equipment and first aid devices;

.3 a verification of the PPE of the personnel involved; and

.4 a confirmation that the shore-side electrical power sub-station circuit breaker is open and earthed, as well as a visual inspection.

The shore-side should conduct the inspections, as provided in sub-paragraph .1 to .4 and the ship-side should conduct the inspections, as provided in sub-paragraph .1 to .3;

.2 cross check of the communication equipment in accordance with the rows "Communication Method", as set out in the Annex ~~2~~1 Form;

.3 operation of the cable management system:

.1 ensure the power cables are de-energized;

.2 turn on the cable management system and deploy the cable(s);

.3 plug in cable and secure the cable grip; and

.4 activate the cable monitor systems to automatically observe the cable tension and length, and adjust, as necessary; and

.4 simulation of the "safety circuit pilot loop operation" by shore and ship sides to confirm the appropriate breakers will trip.

3.2.1.3 When shore power transfer via cable management systems are installed on shore, the shore-side should provide the cables to the ship-side according to the requirements of

3.2.1.2.3.1, 3.2.1.2.3.2 and 3.2.1.2.3.4, and the ship-side should operate according to the requirements of 3.2.1.2.3.3.

3.2.1.4 When shore power transfer via cable management systems are installed on a ship, the ship-side should provide the cables to the shore-side according to the requirements of 3.2.1.2.3.1, 3.2.1.2.3.2 and 3.2.1.2.3.4 and the shore-side should operate according to the requirements of 3.2.1.2.3.3.

3.2.2 Supply of power

3.2.2.1 ~~Parallel supply of power~~ Where the shipboard generator is intended to run in parallel with the shore power for a short period of time for the purpose of connecting to the shore power, the operation procedure should follow the flow chart 2 in Annex ~~3~~2. The procedures may include but not limited to the followings:

.1 the ship-side should send the signal of "permission to close the breaker" to the shore-side and confirm that the power connection circuit breakers are in the "~~connected~~ closed" position; and

.2 the shore power transfer by the ship-side should be as follows:

.1 load should be synchronized and transferred between the shore supply and the ship source(s) of electrical power following their connection in parallel;

~~.2 the ship electrical system should be connected in parallel to the shore-side electrical power;~~

.~~3~~2 the ship-side should gradually reduce the load for the ship's generators and transfer the load to the shore system; and

.~~4~~3 once the ship's generators have reduced the load sufficiently, the generator breaker should be opened and the engine generator can then be shut down.

3.2.2.2 ~~Blackout supply of power~~ Where load transfer is executed via blackout, operation procedure should follow the flow chart 3 in annex ~~3~~2, in accordance with paragraph 3.2.2.1.1.

3.2.3 Disconnection

3.2.3.1 Shore power disconnection via parallel connection from the OPS should follow flow chart 4 in annex 3. The detailed procedure should include:

.1 a safety inspection, which in turn should include:

~~.1 the identification of access to restricted areas;~~

.1 a verification of the locations of communication devices, i.e. walkie-talkie and telephone, fire-fighting equipment and first aid devices; and

.2 a verification of the PPE of the personnel involved;

.2 the shore power transfer by the ship-side, which should be as follows:

.1 ship-side should switch on ship generator(s);

.2 load should be synchronized and transferred between the shore supply and ship source(s) of electrical power, following their connection in parallel; and

.3 the ship-side should gradually ramp up ~~of~~ the ships generators and ramp down of the shore system;

.3 the ship-side requires disconnection from the OPS;

.4 the ship-side should send the signal of "permission to open the breaker" to the shore-side and confirm that the power connection breaker is in the "disconnected" position;

.5 the cable should be unplugged;

.6 if applicable, monitor cable should be disconnected to avoid a fault of equipment; and

.7 the operation of the cable management system should be conducted, i.e. the shore cable should be collected and stored as per the procedures for the cable management system.

3.2.3.2 Shore power disconnection via a blackout connection should follow flow chart 5 in annex ~~3~~2, in accordance with paragraph 3.2.3.1, except for paragraphs 3.2.3.1.2.2 to 3.2.3.1.2.3.

3.2.3.3 When the shore power disconnection via cable management systems is installed on shore, the shore-side should provide the cables to the ship-side according to the requirements of 3.2.3.1.6 and 3.2.3.1.7 and the ship-side should operate according to the requirements of 3.2.3.1.5.

3.2.3.4 When the shore power disconnection via cable management systems is installed on a ship, the ship-side should provide the cables to the shore-side according to the requirements of 3.2.3.1.6 and 3.2.3.1.7 and the shore-side should operate according to the requirements of 3.2.3.1.5.

3.3 Low Voltage (LV)

3.3.1 The ship-side and shore-side should clarify the division of responsibilities.

3.3.2 A compatibility assessment of the OPS system should be carried out by the ship-side and shore-side prior to shore power connection.

3.3.3 The ship-side and shore-side should conduct safety inspection.

3.3.4 The ship-side and shore-side should establish communication.

3.3.5 When shore power supply condition is confirmed by the shore-side and the ship-side, warning signboard shall be fitted. The shore-side should turn on the main power supply after receiving the readiness signal.

3.3.6 The shore-side and the ship-side should check the phase sequence.

~~3.3.7 The shore-side should start the shore power system with the power off switching mode or electrified switching mode according to the procedures and complete the operation.~~

3.3.~~8~~7 Before the disconnection of the OPS via a blackout, the ship-side should notify the shore-side. The shore-side should cut off the power of the OPS system after the confirmation from both sides.]

3.4 Maintenance

3.4.1 The ship and shore sides should conduct the maintenance of each one's OPS equipment to ensure the assets are in normal working condition.

3.4.2 The maintenance of the ship equipment should be ~~conducted~~ recorded and the records should be kept on board.

3.4.3 The maintenance should include, but not be limited to, the following:

.1 electrical equipment maintenance and testing provisions;

.2 measurement of insulation resistance;

.3 equipment repairs (if necessary); and

.4 maintenance and repair records in the company's safety management system, as provided for in SOLAS chapter IX and the International Safety Management (ISM) Code.

4 Operation manual

4.1 Ships should be provided with a shipboard OPS operation manual.

4.2 Generally, the operation manual should include the procedures for OPS connection and disconnection and should be provided in both the working language and in English. All the necessary terms should be defined within the manual.

4.3 In particular, the operation manual should include, but not limited to, the following contents:

.1 a complete system description, including circuit diagrams, operation instructions and specification of set points of protection, monitoring and alarming devices of the ship ~~and shore~~ installations;

.2 qualification requirements of OPS operation personnel onboard;

.3 procedures for the OPS compatibility assessment;

.4 ~~alternative measures for incompatible OPS~~ operational restrictions (e.g. available power in ports), if any;

.5 ~~There should be a~~ suitable cross boundary procedures, including ~~safety system that is jointly controlled by the ship and shore persons in charge (PIC).This should include~~ appropriate procedures for ensuring the integrity of any isolations, such as a “lock out/tag out” system.

.6 step-by-step instructions for OPS connection and disconnection including equipotential bonding and load transfer;

.7 means to inhibit the starting of large loads that would result in failure, overloading or activation of automatic load reduction (if any) measures when a supply system is connected;

.8 procedures for setting the transfer time limit, which may be adjustable in order to match the ability for an external source of electrical power to accept and transfer load;

.9 emergency shutdown recognition and restoration, in relation to which:

.1 as a minimum, the following situations that could lead to emergency shutdown should be listed: loss of equipotential bonding, high cable tension or shortage of remaining cable length, “safety circuit pilot loop” failure, manual activation of the emergency stop system and disconnection of plugs while energized; and

.2 power restoration procedures for above-mentioned failures should be listed in detail.

.10 power restoration procedures when the ship loses OPS, providing:

.1 that the ship’s electrical power should be restored automatically to the state in which the ship ~~is~~ can be safely operated; and

.2 ~~failure~~ restoration procedures to support the ship’s operations in port;

.11 appropriate provisions for the storage of OPS equipment when not in use. Concerning storage, issues such as temperature, humidity, dirt or dust should be considered; and protection regarding the likelihood of physical damage to the cables, plugs, sockets and associated equipment should also be considered;

.12 a maintenance plan to establish periodic tests and maintenance procedures for the system; and

.13 a log book to monitor voltage, frequency and current when the OPS is in use; this may be satisfied by the ship’s alarm and monitoring system where the OPS parameters are monitored and recorded electronically.

[5 Personnel

5.1 Company, as defined in SOLAS Regulation IX/1.2, should ensure that onboard personnel involved in OPS operation is familiarized with onboard OPS system for safe operation in accordance with STCW Regulation I/14.

5.2 Company, as defined in SOLAS Regulation IX/1.2, should ensure that procedure for OPS operation is established in the ship’s SMS manual onboard.

5.3 A PIC onboard should be in charge of the ship-side installations in service. Electro-technical ratings should be permitted to perform the cable connection and other operational work related to the cable management system under the supervision of the PIC.

5.4 PICs of systems with a nominal voltage of 1kV and more should be:

.1 electro-technical officers holding a certificate of competency in accordance with the requirements of regulations III/6 of the STCW Convention; or

.2 chief engineer officers and second engineer officers on ships powered by main propulsion machinery of 3,000 kW propulsion power or more holding a certificate of competency in accordance with the requirements of regulations III/2 of the STCW Convention and who have completed training in accordance with section B-III/2 of the STCW Convention.

5.5 PICs of systems with a nominal voltage less than 1kV should be:

.1 electro-technical officers holding a certificate of competency in accordance with the requirements of regulations III/6 of the STCW Convention; or

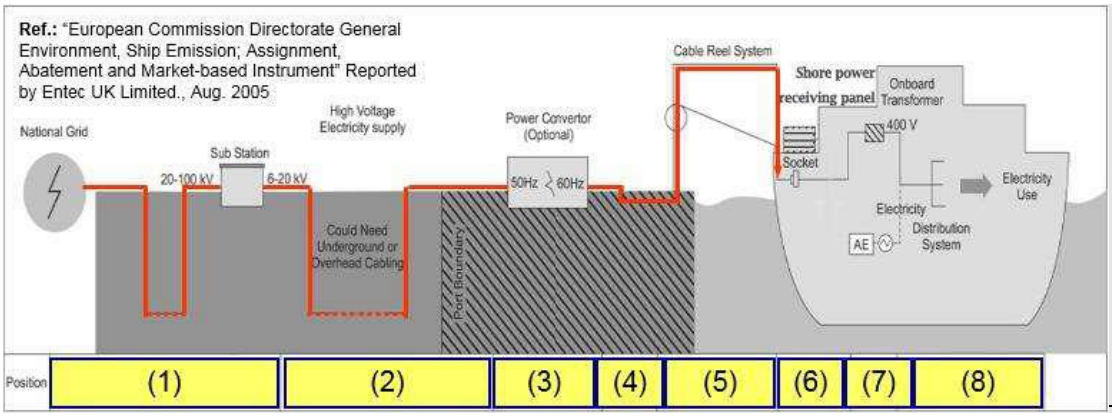
.2 chief engineer officers and second engineer officers on ships powered by main propulsion machinery of 750 kW propulsion power or more who, at least hold a certificate of competency in accordance with the requirements of regulations III/2 of the STCW Convention.

5.6 Electro-technical officers or chief engineer officers and second engineer officers that meet the requirements of paragraphs 5.2.2 and 5.3.2 should conduct onboard training for electro-technical ratings. Onboard training records should be adequately documented in the training record book by the PICs.

5.7 A PIC or a person designated by the PIC should be on duty during the OPS service following connection and power transfer. Only ~~appropriately~~ trained personnel and PICs should be involved with the physical connection, power transfer and OPS disconnection procedures.]

~~ANNEX 1~~

~~EXAMPLE FOR A GENERAL OPS SYSTEM LAYOUT~~



~~Key:~~

~~1~~	~~Connection to the grid of the power supply distribution network to be transformed at the local sub-station~~	~~5~~	~~Cable supporting tower or cable support facility (if necessary)~~
~~2~~	~~Power distribution from the local sub-station to the port terminal~~	~~6~~	~~Shore power receiving panel on board~~
~~3~~	~~Frequency converter (if necessary)~~	~~7~~	~~Transformer depending upon the ship's nominal voltage~~
~~4~~	~~Power supply to the connector at berth/ship for the power receiving cable from ship/berth~~	~~8~~	~~Power distribution onboard the ship~~

ANNEX ~~21~~

Part 1: **OPS COMMUNICATION** (Checklist prior to arrival), Sample FORMAT

No: Date:

Ship's name		Ship's IMO number	
Classification notation	□Yes notation □No	Classification society	
Company			
ETA		ETD	
Port of call		Berth	

	Shore-side	Ship-side
Voltage and the permitted tolerance		
Phase sequence		
Frequency (Hz)		
Capacity (kVA)		
Shore-side source impedance		———
Shore-side neutral grounding method		———
Type of plug/ socket	□plug type □socket type	□plug type □socket type
The length of the ship to shore connection cable (m)		
Connection location		
~~Communication method~~	~~□Direct verbal~~ ~~□Radio~~ ~~□Mobile phone or phone number~~ ~~□Others~~	~~□Direct verbal~~ ~~□Radio~~ ~~□Mobile phone or phone number~~ ~~□Others~~
~~Data communication~~	~~□Power failure signal~~ ~~□Fault switch signal~~ ~~□Grounding fault signal~~ ~~□ESD signal~~ ~~□Cable management system alarm signal~~ ~~□Other signals(specify)~~	~~□Power failure signal~~ ~~□Fault switch signal~~ ~~□Grounding fault signal~~ ~~□ESD signal~~ ~~□Cable management system alarm signal~~ ~~□Other signals(specify)~~
Any modification in the OPS system that may influence the validity of initial compatibility assessment exist	Yes□ (specify) No□	Yes□ (specify) No□

Other important information and contents to be confirmed by the ship-side in advance	(1)Did this ship make a successful shore connection according to this guidance in the past 12 months? Yes□; NO□（If “no”, reason）_____ ; (2)Did this ship make a successful shore connection in other berths of this port? Yes□, Berth’s number : No□ ; (3) ; (4) ;		
Other important information and contents to be ~~confirmed~~ communicated by the shore-side in advance	（1）_____ ; （2）_____ ;		
~~The signature of the ship-side~~		~~Date~~	
~~The signature of the shore-side~~		~~Date~~	

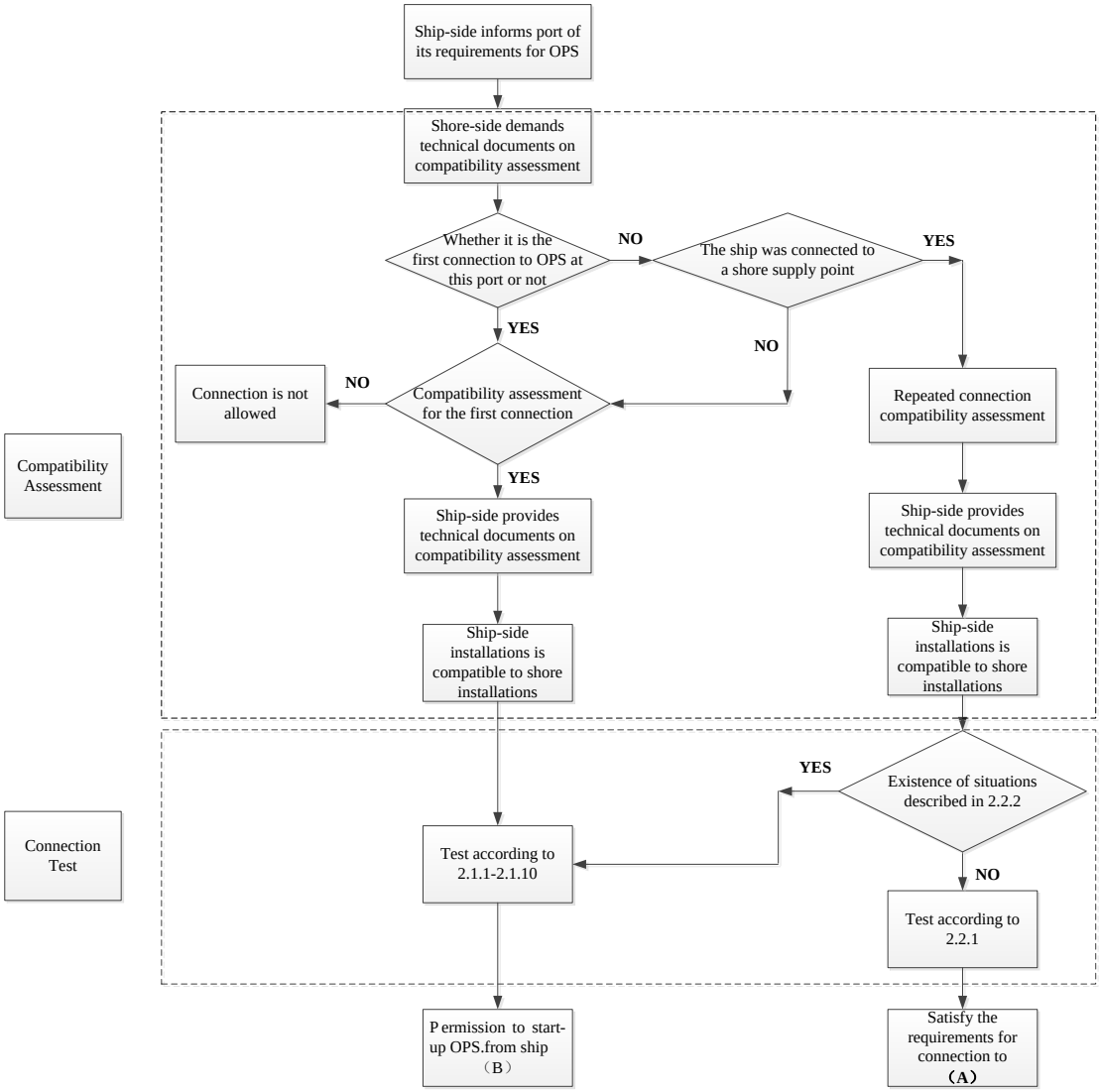
Note:
Contact person of the ship-side: Contact Number:
Contact person of the shore-side: Contact Number:

Part 2: OPS COMMUNICATION (Checklist before Connection), Sample FORMAT
No: Date:

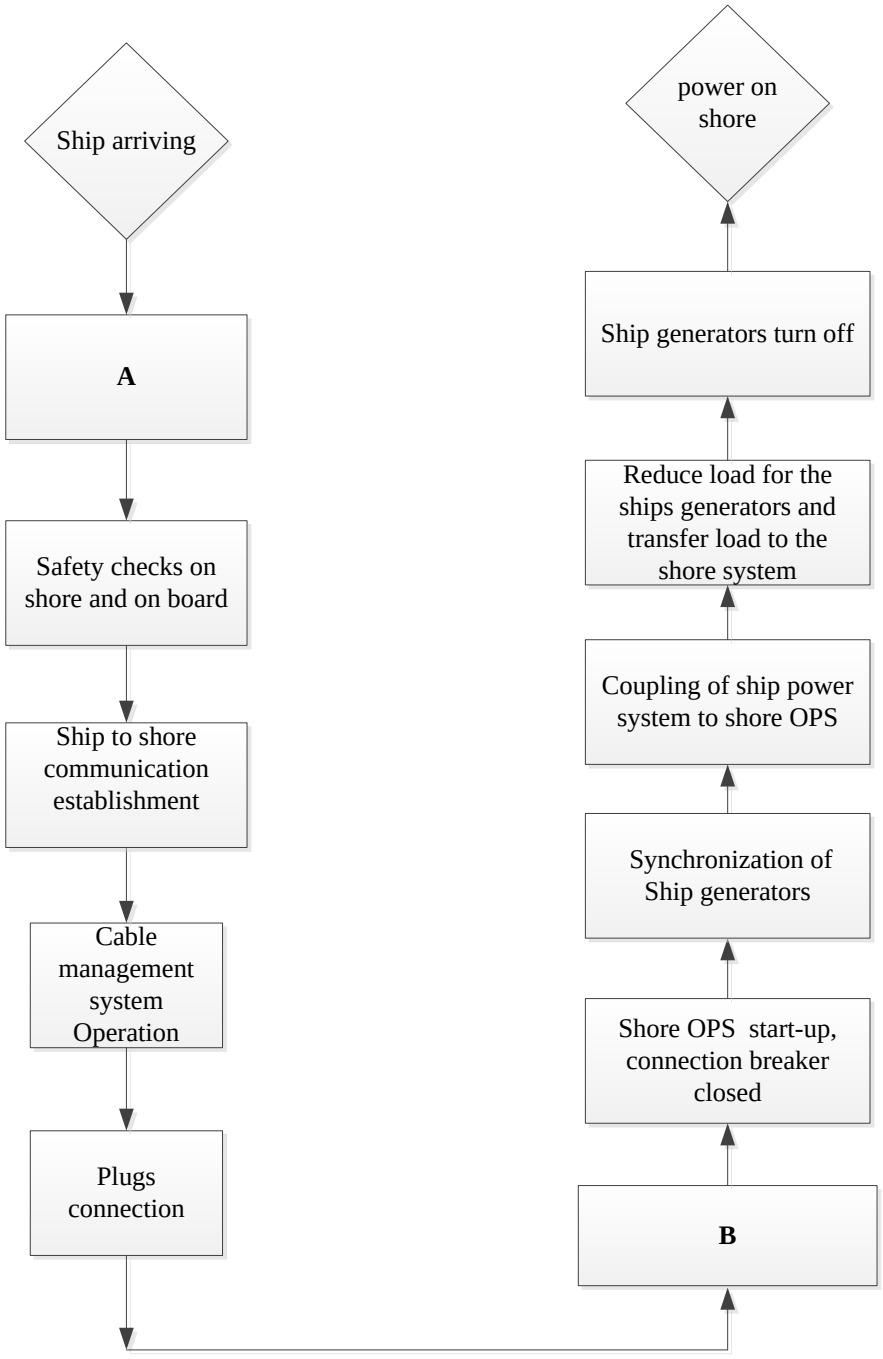
Ship's name		Ship's IMO number	
Company			
Time of Arrival		Time of Departure	
Port		Berth	
	Ship side	Shore side	
Nominal Voltage			
Frequency (Hz)			
Shore-Side Capacity (kVA)			
Communication method	□Direct verbal □Radio (channel/frequency: ….) □Mobile phone or phone number: …….. □Others	□Direct verbal □Radio □Mobile phone or phone number: …….. □Others	
Data communication （if provided）	□Power failure signal □Fault switch signal □Grounding fault signal □ESD signal □Cable management system alarm signal □Other signals(specify)	□Power failure signal □Fault switch signal □Grounding fault signal □ESD signal □Cable management system alarm signal □Other signals(specify)	
Person in Charge, Name: The signature of the ship-side		Date	
Person in Charge, Name: The signature of the shore-side		Date	
Note: Contact person of the ship-side: Contact Number: Contact person of the shore-side: Contact Number:			

ANNEX ~~3~~2

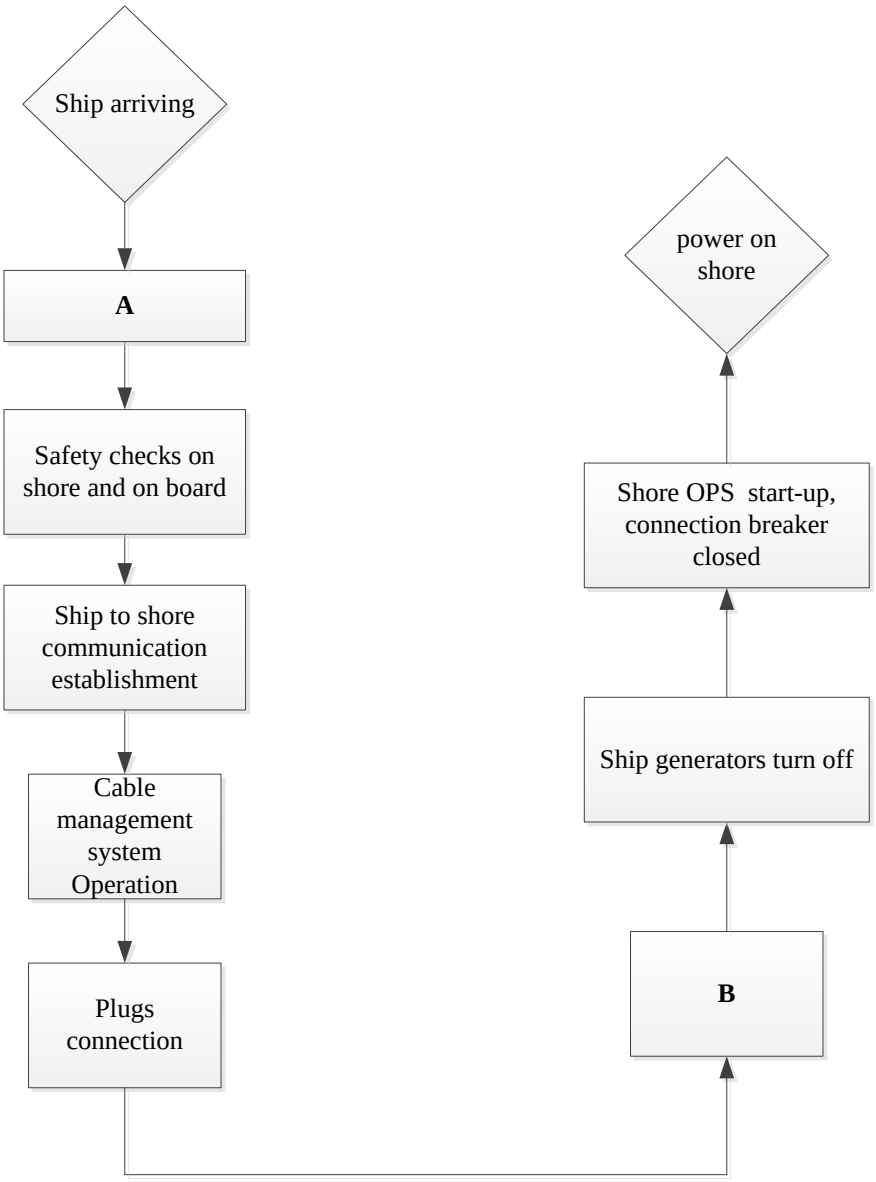
OPERATION FLOW CHART FOR OPS CONNECTION



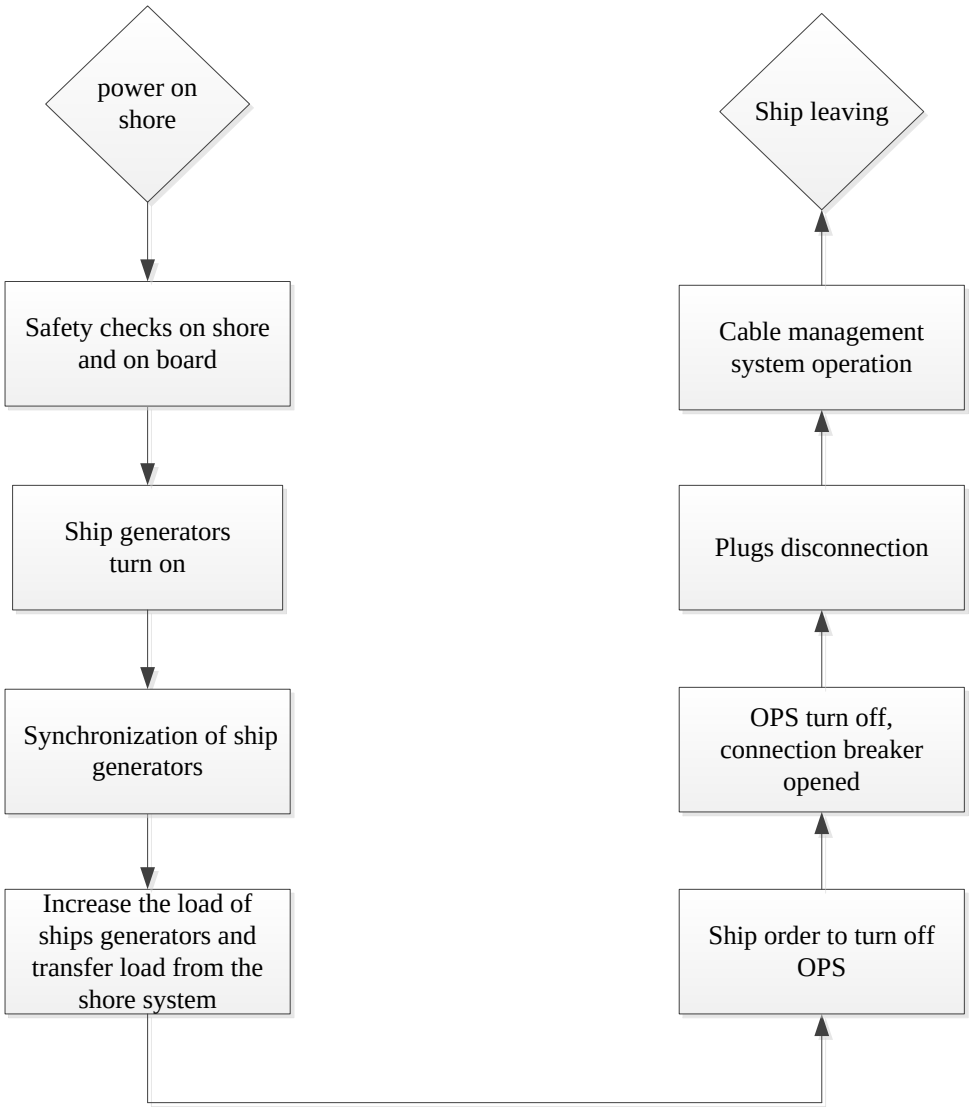
Flow chart 1 - Compatibility assessment before the ship’s OPS connection



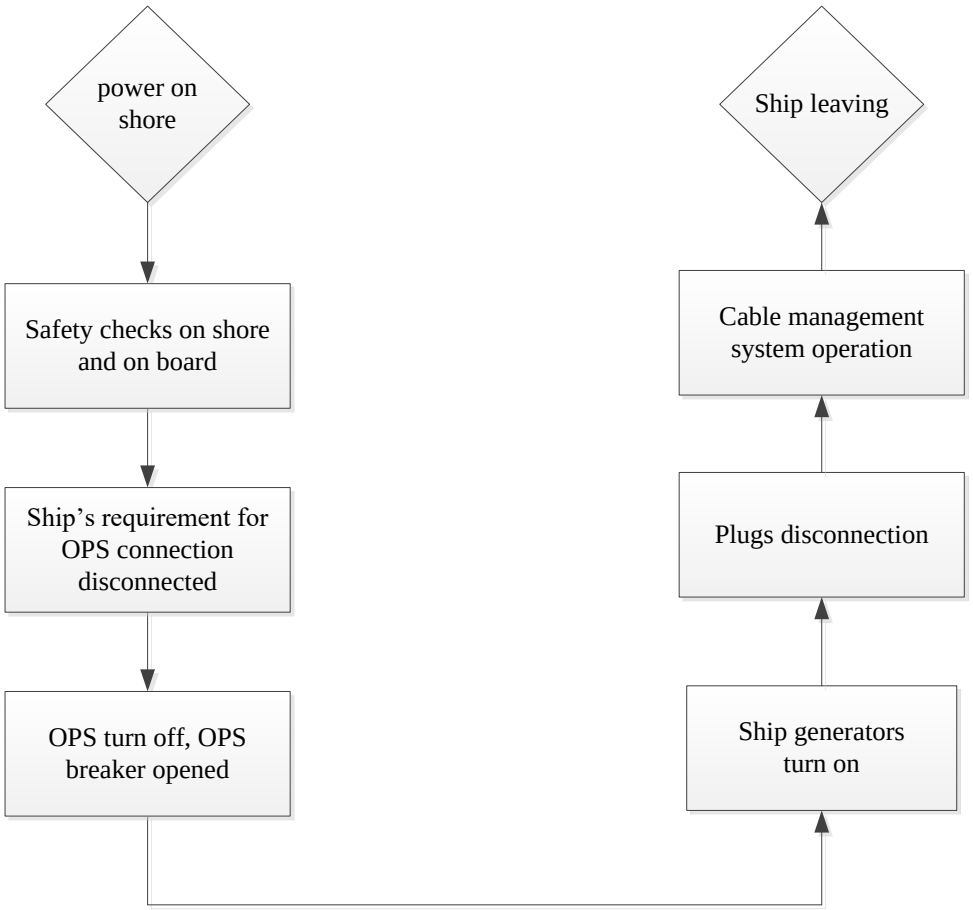
Flow chart 2 – Ship's connection to OPS upon arrival with shore power transfer via parallel connection



Flow chart 3 – Ship's connection to OPS upon arrival with shore power transfer via blackout



Flow chart 4 – Ship's disconnection from OPS ~~upon departure~~ with ~~shore~~ power transfer via parallel connection



Flow chart 5 – Ship's disconnection from OPS ~~upon departure~~ with ~~shore~~ power transfer via blackout

INTERNATIONAL MARITIME ORGANIZATION

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SUB-COMMITTEE ON SHIP DESIGN AND CONSTRUCTION
7th session
Agenda item 11

SSE 7/11/X
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DEVELOPMENT OF GUIDELINES FOR COLD IRONING OF SHIPS AND CONSIDERATION OF AMENDMENTS TO SOLAS CHAPTERS II-1 AND II-2

Comments on the report of the Correspondence Group (document SSE 7/11)

Submitted by …and ICS……

SUMMARY

Executive summary:	This document comments on the report of the Correspondence Group on the Development of guidelines on safe operation of onshore power supply (OPS) service in port for ships engaged on international voyages.
Strategic direction, if applicable:	2
Output:	2.8
Action to be taken:	Paragraph 18
Related documents:	SSE 7/11, SSE 6/18

1 This document is submitted in accordance with the provisions of paragraph 6.12.5 of the *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.1), and provides comments on the report of the report of the Correspondence Group on the Development of guidelines on safe operation of onshore power supply (OPS) service in port for ships engaged on international voyages.

2 At SSE 6 the Sub-Committee re-established the Correspondence Group on the Development of guidelines on safe operation of onshore power supply service in port for ships engaged on international voyages (the draft Guidelines) for further consideration and discussion under the coordination of China (SSE 6/18, paragraph 11.11).

3 The Correspondence Group was instructed to further develop the draft Guidelines, limited to operational requirements, based on the draft text set out in the annex to document SSE 6/11, taking into account document SSE 6/11/1; and to submit a report to SSE 7.

4 The report of the Correspondence Group is provided in document SSE 7/11 (China).

5 This submission comments on the report of the Correspondence Group and provides recommendations to address those issues for which the group was unable to reach a consensus.

Discussion

6 [ICS][The co-sponsors] welcomed the decision of the Sub-Committee to develop the draft Guidelines and thank [our][their] the members of the Correspondence Group, especially the coordinator of the group. Cold ironing/onshore power supply (OPS) can reduce emissions of NOx, SOx and PM in port areas, and may contribute to lowering GHG emissions in ports where electricity is supplied from low carbon sources. Some countries and ports are promoting the use of OPS, including mandatory measures in some areas. [ICS][The co-sponsors] recognise the value of OPS in improving local air quality in ports and lowering GHG emissions, however successful implementation of OPS globally has faced a number of challenges arising from an absence of global standards and guidelines for safe operation of OPS. The draft Guidelines are necessary to promote the safe use of OPS and facilitate greater use of OPS.

7 The Correspondence Group was unable to reach agreement on a number of important issues, including inter alia, whether to:

- include references to IEC/IEEE 80005-1:2019;
- retain or delete "Section 2 Verification and Testing";
- retain or delete paragraphs 3.2.1.3 to 3.3.8 in "Section 3 Operation"; and
- retain or delete the "Operation Flow Chart for OPS Connection" in annex 3 to the draft Guidelines.

This document provides recommendations to assist the Sub-Committee in resolving these outstanding issues with a view to facilitating completion of the draft Guidelines.

8 These outstanding issues have arisen in part because of the terms of reference agreed at SSE 6 which were to focus “only on operational matters for consideration by the Sub-Committee” (SSE 6/18, paragraph 11.9). [ICS][The co-sponsors] support the decision of SSE 6 to develop operational guidelines only, however this does not preclude references to technical standards or to technical matters which are essential for the safe operation of OPS. Guidelines for safe operation of electrical systems, especially high voltage (HV) electrical systems need to reference applicable technical standards and technical aspects which are an inherent and indivisible element of safe operation in order to be fit for their intended purpose.

9 The draft Guidelines are intended to facilitate safe use of OPS at a global level. Technical compatibility is critical to the safe operation of electrical systems and apparatus. As such [ICS][the co-sponsors] consider that IEC/IEEE 80005-1:2019 needs to be referenced in the draft Guidelines since it provides necessary technical requirements to facilitate compatibility between equipment provided to ships and ports/terminals.

10 Section 2 of the draft Guidelines includes essential tests and checks which should be completed when making the first connection between ship and shore OPS equipment, and at subsequent port calls, including a general requirement that “*There should be a suitable cross boundary safety system that is jointly controlled by the ship-side and shore-side PIC. This should include appropriate procedures for ensuring the integrity of any isolations, such as a*

"lock out/tag out" system". This section 2 provides essential requirements for the safe operation of OPS and must be retained. The provision of equivalent requirements in IEC/IEEE 80005-1:2019 has been used to support the argument that this section be deleted, however it has also been proposed that references to this standard be removed from the draft guidelines. It is contradictory to call for the removal of references to IEC/IEEE 80005-1:2019 at the same time as calling for the removal of safety critical checks from the draft Guidelines on the basis that they are addressed in IEC/IEEE 80005-1:2019. It might be acceptable to include a general reference IEC/IEEE 80005-1:2019 in the introductory paragraphs followed by references to specific sections of that standard for essential tests and checks in the appropriate sections of the document, however [ICS][the co-sponsors] would prefer to retain both the reference to IEC/IEEE 80005-1:2019 and the draft Section 2.

11 Sections 3.2.1.3 to 3.3.8 include guidance on the following matters, inter alia:

- cable management, and clarification of responsibilities according to whether the OPS connection uses a cable provided by the ship or by the shore facility;
- transfer of load from ships generators to OPS, and subsequent disconnection from OPS; and
- requirements for low voltage (LV) systems.

These elements are essential components of safe operation of OPS.

12 The flow charts for OPS connection provided in annex 3 to the draft Guidelines provide a good visual summary which some readers may find a useful aid when using the document. Although not essential, they are nevertheless a useful aid and it is recommended that they be retained.

Analysis

13 The draft Guidelines are intended to promote consistency and the safe use of OPS at a global level. One of the principal barriers to the greater use of OPS globally has been inconsistent standards, both technical and for the safe operation of OPS. If member States intend to further promote (and in some cases mandate) the use of OPS then it is essential to agree global guidelines for the safe operation of OPS systems.

14 The nature of OPS means that systems are subject to two safety management systems, that of the ship and that of the port/terminal. In any risk management system, cross boundary interfaces of this nature present a heightened risk and require careful management. This is recognised in land-based electricity regulations where there are additional safety requirements for cross boundary interfaces. The cross-boundary interface between ship and shore when using OPS necessitates a common, global, regulatory framework.

15 As highlighted in paragraphs 8 – 11 of this document, the references and sections of the draft Guidelines which some members of the Correspondence Group have proposed to delete include, inter alia:

- compatibility between ship and shore OPS systems;
- essential checks when making the first connection between ship and a shore connection to which the ship has not previously connected;
- transfer of load and disconnection;
- cable management; and
- cross boundary safety management.

Deleting these references and sections would negate the value of the draft Guidelines. It should be noted that IEC/IEEE 80005-1:2019 is not a regulatory document and is insufficient to ensure the global safe operation of OPS.

16 The decision of SSE 6 to develop operational guidelines for OPS does not preclude references to technical standards where this is necessary to ensure safe operation of OPS. If the draft Guidelines are intended to ensure safe operation of OPS then the references and sections considered in paragraphs 8 – 11 must be retained.

Proposal

17 The Sub-Committee should agree to retain the following references and sections of the draft Guidelines:

- references to IEC/IEEE 80005-1:2019;
- section 2 - verification and testing;
- paragraphs 3.2.1.3 to 3.3.8; and
- the operation flow chart for OPS connection in annex 3 to the draft Guidelines.

Action request of the Sub-Committee

18 The Sub-Committee is invited to note the comments provided in paragraphs 6 to 17 and proposals in paragraph 17 of the document and take action as appropriate.