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LIMITE

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WORKING DOCUMENT

From:	General Secretariat of the Council
To:	Working Party on Shipping
N° Cion doc.:	WK 14938/25
Subject:	Preparation of IMO/SSE 12 (London, 9-13 March 2026) – Draft Union submission to the 12th session of the International Maritime Organization's Sub-Committee on Ship Systems and Equipment providing input to the work plan for development of Interim guidelines for the safety of ships using Battery Energy Storage Systems – Presidency compromise proposal

In view of the Shipping Working Party meeting on 24 November 2025, delegations will find attached a Presidency compromise proposal.

Changes compared to the previous version are indicated in **bold underline** (added text) and ~~strikethrough~~ (deleted text).

Reservation: the Shipping Working Party is willing to discuss and possibly agree to the draft submission. However, this should not be taken as a precedent concerning joint submissions or positions on non-mandatory interim guidelines which may be developed in the future in areas of Union competence.

General scrutiny reservation: all delegations.

Deadline for submission to IMO: 5 December 2025.

**DEVELOPMENT OF A SAFETY REGULATORY FRAMEWORK TO SUPPORT THE
REDUCTION OF GHG EMISSIONS FROM SHIPS USING NEW TECHNOLOGIES AND
ALTERNATIVE FUELS**

**Input to the work plan for development of Interim guidelines for the safety of ships
using [Battery] [Electric] Energy Storage Systems**

**Submitted by Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia,
Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania,
Luxembourg, Malta, Netherlands (Kingdom of the), Poland, Portugal, Romania,
Slovakia, Slovenia, Spain, Sweden and the European Commission**

SUMMARY

Executive summary: This document provides information and proposes a way forward for the development of interim guidelines for the safety of [battery] [electric] energy storage systems as instructed by MSC 110 and a plan for organising the work.

Strategic direction, if applicable: 3

Output: 3.8

Action to be taken: Paragraph {39}

Related documents: FP 55/8/4, MSC 97/INF.8, HTW 10/6/7, HTW 11/7/3, MSC 109/INF.7, MSC 109/6/2, MSC 109/WP.9, MSC 109/WP.9/Add.1, MSC 110/6/5, MSC 110/21, MSC 110/WP.9

Introduction

1 In the context of the development of a safety regulatory framework to support the reduction of GHG emissions from ships using new technologies and alternative fuels, at MSC 110, the Committee assigned the tasks listed in annex 4 to MSC 110/WP.9 to the SSE Sub-Committee. Priority was given to the **tasks regarding new development of interim guidelines for the safety of ships using battery energy storage systems (lithium-ion batteries, supercapacitor energy storage technology, swappable traction lithium-ion battery containers)** and supercapacitors and to updates to the FSS Code concerning alcohol fires.

2 In this context, the Committee agreed to invite interested Member States and international organizations to submit relevant documents for consideration at SSE 12 regarding the prioritized tasks.

3 The Committee also requested the preparation of a work plan for the assigned tasks, taking into consideration the Sub-Committee's existing work plan, and recommended the SSE Sub-Committee to consider the establishment of a correspondence group, if deemed necessary.

4 This document builds on existing information, industry and national recommendations on the safety of lithium-ion battery energy storage systems and supercapacitors, **for example faradaic or electrochemical supercapacitors**, to propose a scope and structure of the interim guidelines and a plan for organising the work of the Sub-Committee on this topic.

Demand by stakeholders and fleet uptake

5 Based on the order books¹, the number of battery ships in operation is expected to increase by 40% within the next couple of years. An analysis of the market development from 2008 to 2022 and assuming that batteries will be part of the solution for the adoption of future fuels in the path to decarbonisation², it is anticipated that by 2050, approximately 18.2% (in terms of the number of ships) of the global merchant fleet will be equipped with batteries, almost 39,000 ships. The current rate of battery installations shows an annual growth in installed capacity of 16%. Additionally, the annual global demand for maritime batteries in 2030 is forecasted to reach 916 MWh, and 11,955 MWh by 2050.

6 In the absence of an international regulatory framework, specific rules and guidance by the classification societies and industry, regional guidance and national recommendations, have become available, such as:

.1 EMSA Guidance for Battery Energy Storage Systems.³

.2 The Norwegian Maritime Authority's safety notices on battery fires with subsequent gas explosion (SM 3-2019 and SM 4-2021), protecting battery systems against humid, salty air and seawater intrusion (SM 2-2023), and the Guidelines on requirements for training in chemical storage (maritime battery systems) on board Norwegian ships (RSV 7-2023).

.3 The Swedish Transport Agency (STA) guidelines for battery and hybrid electrically propelled ships published in 2018, titled: "Transportstyrelsens riktlinjer för batteri- och hybriddrivna fartyg" (TSG 2018-735, updated in 2023 TSG 2023-1338).

.4 The Danish Maritime Authority's (DMA) guidelines on battery installations submitted for information to IMO in 2016 in document MSC 97/INF.8.

.5 The requirements for battery installations published by the MCA (Maritime and Coastguard Agency, UK) in 2016: "Electrical Installations - Guidance for Safe Design, Installation and Operation of Li-ion Batteries" (MGN 550).

.6 The Italian Coast Guard Headquarters (ITCG HQs) *Circular No. 35/2025 titled "Instructions to Recognized Organizations for the approval of Alternative Design and Arrangements (AD&A) studies for ships using alternative fuels and low or zero emission technologies"*.

.7 Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 concerning batteries and waste batteries.

¹ [Alternative Fuels Insight \(AFI\) | Veracity by DNV](#) consulted on 17/07/2025

² Current Status of Maritime Batteries and Future Outlook, Syb ten Cate Hoedemaker, Maritime Battery Forum, Rotterdam/Netherlands

³ [Ship Safety Standards - Battery Energy Storage Systems \(BESS\) - EMSA - European Maritime Safety Agency](#)

7 Electric Energy Storage Systems are already in use on board ships for main propulsion, auxiliary services or peak shaving and boosting purposes, as well as blackout prevention. According to the Alternative Fuels Insight (AFI) platform there are more than 1,000 battery-powered ships in operation worldwide, either domestically or in international waters. To put it in perspective, the number of battery-powered ships exceeds the combined number of LNG and methanol vessels. By application, 19% of the ships in operation are pure-electric and 81% operate in a hybrid configuration. Lithium-ion-based cell chemistries are used in 99% of ships in operation, with 76% of those using a lithium nickel manganese cobalt oxide (NMC) and 14% using lithium-iron phosphate (LFP).

Proposed scope of the interim guidelines

8 The statistics presented in 7, suggest that the primary focus of the work should address installations of Battery Energy Storage Systems (BESS) made of lithium-ion with liquid electrolyte technology, eventually identifying specific requirements for NMC and LFP as appropriate. Other ~~other~~ **battery** technologies, such as sodium-based, or solid states solutions ~~and may be considered at a later stage.~~ Furthermore, other energy storage technologies, such as supercapacitors, ~~as appropriate.~~ **Supercapacitors** raise distinct safety considerations that, for clarity and accuracy, should be addressed in ~~a~~ separate sections. Nevertheless, the co-sponsors support these to be included within the same set of guidelines for energy storage systems ensuring a comprehensive and unified resource on the subject as suggested in Annex 4 of MSC 110/WP.9.

9 The size of the batteries in terms of amount of energy stored, is often used by class societies and in the existing safety recommendations to determine their applicability. In some cases, the intended use of the batteries is also a factor. The co-sponsors consider that the amount of energy stored onboard is the primary safety concern, not its intended use, therefore a lower energy content limit for a BESS to fall under the scope of this work should be established. The most commonly used capacity threshold lays at 20 kWh which is considered practical and appropriate to consider for SOLAS vessels. In operational practice, larger vessels likely require battery capacities above this threshold.

10 The interim guidelines should be made suitable to address fixed installations and swappable or containerized batteries. The co-sponsors consider the safety considerations are primarily common to the battery technology and the amount of energy stored rather than configuration. Therefore, functional requirements can be adapted to containerized, distributed or stationary installations onboard.

11 There should be a discussion whether the capacity threshold is set for the energy installed in single segregated compartments or the total onboard installation.

12 The interim guidelines should, in principle, apply to newbuilds and to new installations of [Battery] [Electrical] Energy Storage Systems [(BESS)] [(EESS)]⁴ in existing ships; however, the guidance should also include recommendations on whether and, if so, how BESS already installed in existing ships should be addressed.

⁴ Use of BESS/EESS to be harmonized once a decision on the way forward is taken by Member States.

13 The performance requirements and testing standards for the battery systems and, where suitable, existing industry standards for maritime batteries should be referenced. The International Electrotechnical Commission (IEC) is developing a new industry standard for maritime batteries that is planned to be published on 31st December 2026. A recent analysis by the European Commission's Joint Research Centre⁵ provides a comparative analysis of safety tests in various existing standards for the safety of stationary battery energy storage systems that may be applicable to maritime batteries.

14 The Sub-Committee should consider if at this stage there is enough information to account for the distinct safety concerns related to aging, wear and tear and best practices for the safe and effective reuse of second-life batteries or if their safety should be left out of the scope of the specific provisions in the guidelines.

Preliminary technical considerations

15 In this section few preliminary considerations are provided in an attempt to sketch some of the relevant elements around the installation of BESS on board of ships.

16 In line with recent IMO regulatory development principles, the work should be inspired by goal-based principles as per MSC.1/Circ.1394/Rev.2.

17 It should be considered the need for a specific section addressing the main technical and safety features of the BESS itself, firstly identifying the boundary of the system and then giving considerations to some of the most relevant and safety critical elements such as cells, modules, packs, Battery Management System (BMS), converters and inverters chargers, Uninterruptible Power Systems (UPS) and communication protocols.

18 Further considerations should be given to the integration of the BESS as a whole in the Energy Management System (EMS) and to its interaction with the crew (human element) in terms of information to be provided, alerts and alarms.

19 For fixed installations in ship spaces, consideration should be given to the energy content and whether systems other than the BESS are allowed in the space but also considerations related to storage (including battery room location and related aspects), alarm systems, and type approval.

20 The relevant chapter of fire safety should be carefully discussed in the light of the fact that BESS contains oxidant and oxidizers to sustain fire and pose re-ignition hazard. It has to be considered whether the fire safety strategy should be tailored to the service of the ship (ocean going or short sea passages).

21 Fire detection, containment and extinguishment requirements may be then considered in the light of service of the ship and of the overall fire safety strategy considering issues such as re-ignition suppression or denial, structural integrity and load bearing while distinguishing between fire safety systems built-in the BESS racks with those pertaining to the space of the ship.

22 The ventilation strategy of the battery space should be considered in normal and emergency situations in combination with the fire safety one, giving due considerations to elements such as the potential building-up of toxic atmosphere, the energy capability of the BESS, the built-in systems ventilation capabilities and other.

⁵ [Hildebrand, S., Eddarir, A. and Lebedeva, N., Overview of battery safety tests in standards for stationary battery energy storage systems, Publications Office of the European Union, Luxembourg, 2024, doi:10.2760/08079, JRC135870](https://publications.jrc.ec.europa.eu/publication/?id=JRC135870)

23 Consider the need for, at least, some high-level, functional requirements for electrical installation to address known electrical hazards such as short circuits, electromagnetic compatibility, harmonic distortion and others.

24 Thorough consideration should be given to the tests and acceptance criteria required for the BESS system (such as propagation test for the cells) as well as to those required on board jointly with a gas and explosion analysis.

25 Consideration should be given to the minimal set of procedures needed to safely run the BESS during normal and emergency operations as well as during recharging.

26 In the light of the work that may be requested of other sub-committees, particularly the work concerning training and qualification should be considered.

27 Containerized batteries should, in general, apply the same principles as for the fixed installations. However, additional considerations would be needed such as securing to the ship structure, deck space for safe loading and unloading, maintenance free space, built-in detection, containment and fire-fighting system preventing outward expansions of the flames, interface with the systems of the ship, breaching for fire-fighting means, structural integrity and UPS protection for the BMS.

28 [For supercapacitors can be noted that the unique highly-porous electrode increases its surface area for holding a charge, resulting in much larger capacitance and energy density than other types of capacitors. Electrochemical capacitors differ from common electrolytic capacitors in that they store a charge at the liquid-solid interface of the electrodes when a potential is applied rather than in a solid dielectric material covering the surfaces of the electrodes. Some other common names for an electrochemical capacitor are “double layer capacitor”, “ultracapacitor”, “Electrochemical Double Layer Capacitor”, “supercapacitor”, and EDLC.]

29 Should the Sub-Committee decide to follow the GBS structure, it is suggested to consider that, at least, during the development of the regulatory framework each section is introduced by the list of the relevant hazards. Furthermore, it is suggested to specialize the risk-assessment section with the list of the minimal set of hazards to be addressed.

Proposed structure of the interim guidelines

30 Annex I includes a proposed structure of the interim guidelines for energy storage systems based on the above considerations.

31 The co-sponsors support the development of requirements using a goal-based approach that remains flexible to adjust to the technology as it evolves.

32 The interim guidelines should be drafted as supplementary to existing instruments.

Proposed considerations on the existing and future work plan

33 As suggested in MSC 110/WP.9, the co-sponsors would support to address the matter comprehensively under the same workstream (fixed on-board, containerized battery installations and supercapacitors) rather than splitting into parallel discussions.

34 The co-sponsors would support the establishment of a correspondence group at SSE 12 for the development of the interim guidelines and suggest the terms of reference as per Annex III.

35 The co-sponsors would consider 3 sessions necessary for the approval of the interim guidelines. Possible work plan below:

2026	2027	2028	2028	...	
SSE 12	SSE 13	SSE 14	MSC 115	...	
Output 3.8 BESS	Output 3.8 BESS	Output 3.8 BESS	Approval [of the Interim Guidelines]	Experience gaining	

Other useful references

36 Annex II proposing a preliminary set of definitions⁶ for establishing a common understanding of basic concepts concerning BESS. For supercapacitors, relevant sources are IEC 62933-1:2018, IEC 62933-5-2:2020, and ABS: *Use of Supercapacitors in the Marine and Offshore Industries*.

37 SEABAT project on the development of modular full electric maritime battery concept: [Homepage - SEABAT](#)

38 *Current Direct* project on the use of swappable containerized batteries: [Deliverables - Current Direct](#)

Action requested of the Sub-Committee

39 The Sub-Committee is invited to consider the information provided for the development of the work plan under this output related to the technologies listed in Annex 4 to MSC 110/WP.4.

⁶ From the EMSA Guidance for Battery Energy Storage Systems.

ANNEX I

Proposal for structure:

INTERIM GUIDELINES FOR THE SAFETY OF SHIPS USING [BATTERY] [ELECTRIC] ENERGY STORAGE SYSTEMS

1 INTRODUCTION

2 GENERAL

2.1 Scope of application

2.2 Definitions

2.3 Alternative Design

3 GOAL AND FUNCTIONAL REQUIREMENTS

3.1 Lithium-ion batteries

3.2 Supercapacitors

3.3 Others

3.4 Risk assessment

4 LITHIUM-ION BATTERIES

4.1 Battery Energy Storage System (BESS)

HAZARDS to address:

- Overall, BESS design does not provide sufficient protection to prevent injuries.
- Energy stored in BESS is not sufficient, not readily available for the intended use in relation to the task of the ship and the functions assigned to the BESS and/or does not consider the ageing of the equipment.
- The BESS does not provide for redundancy, continuity of power supply in normal and in emergency operations, when it is the sole source of power, or when its functions provide energy for the essential services foreseen in MSC.1/Circ.1572 Annex 5.
- BESS is not designed for interfacing with other ship's systems, nor for being maintained and operated in marine environment, taking in duly considerations electrical hazards.
- BESS is not able to sustain large amplitude ship motions.
- ...

4.1.1 Cells, modules, packs

HAZARDS to address:

- Internal cell failure causing thermal runaway.
- Temperature control for cells and modules is not adequate.
- Means to prevent or mitigate internal short circuits, mechanical and electrical hazards are not implemented.
- Means to manage the thermal runaway propagation are not provided.

- ...

4.1.2 Uninterruptible Power Supply (UPS)

HAZARDS to address:

- *Loss of BESS safety functions due to loss of power.*
- *Configuration and available uninterruptible power supply is not able to maintain the functioning of the BESS's safety functions.*
- ...

4.1.3 Battery Management System (BMS)

HAZARDS to address:

- *Overcharge and over discharge are uncontrolled.*
- *High temperature during charging and discharging operations is not monitored and no measures implemented in case of overtemperature.*
- *BMS is not protected from unscheduled power interruptions.*
- *Interaction between the BMS and EMS is faulty leading to non-report of alarms and alerts, incorrect assessment of power demand and others.*
- *Cyber resilience is not ensured*
- ...

4.1.4 Other Components

HAZARDS to address:

- *Communication protocol fails to deliver, where needed, alarms and alerts messages.*
- *Communication protocols are compromised for the failure of a single node of the network.*
- *Converters and inverters-chargers do not operate as an integrated system, not providing for electrical protection and parameters within the range and tolerances of the BESS.*
- *Use out of operational tolerances and consequent system failures are not reported.*
- ...

4.1.5

4.2 BESS on-board arrangements

4.2.1 BESS spaces

HAZARDS to address:

- *Mechanical impact damaging the battery space.*
- *Battery gassing, fire and/or explosion originating inside the battery space.*
- *Water ingress, leakages and condensation in the battery space.*
- *External factors to the BESS determining unsafe conditions inside the battery space (such as fires, outside temperature).*
- *Overall degradation of the system and its performances due to environmental conditions.*
- ...

4.2.2 Fire Safety

HAZARDS to address:

- *Fire from other sources inside the battery space reaches the battery.*
- *Battery generated fires due to thermal runaway are not detected at inception.*
- *Fire re-ignition.*
- *Extinguishing means generate explosive, toxic and/or corrosive chemical compounds.*
- *External factors to the BESS determining unsafe conditions inside the battery space (such as fires, outside temperature).*
- *....*

Detection:

- *Thermal runaway is not detected at early stage and no consequential fire safety measures are taken.*
- *Detection technology is not able to detect fire inception from the relevant active conditions (e.g. High air speed impairing detection capabilities).*
- *...*

Containment:

- *Smoke and fire from outside the battery space determines unsafe conditions inside the battery space.*
- *Structural integrity is endangered by loss of containment.*
- *...*

Extinguishment:

- *Re-ignition of the fire in the battery space.*
- *Extinguishing means are not able to reach the fire.*
- *Extinguishing means generate explosive, toxic and/or corrosive chemical compounds.*
- *...*

4.2.3 Ventilation / HVAC

HAZARDS to address:

- *Overtemperature.*
- *Accumulation of toxic and explosive battery off-gases.*
- *Accumulation of smoke due to a fire.*
- *High level of humidity and condensation.*
- *....*

4.2.4 Electrical safety

HAZARDS to address:

- *External short circuits (high temperature, high humidity, others).*
- *Arc-flash.*
- *Faulty electrical protection of the system (over current, over and under voltage) and network.*
- *Earth fault.*
- *Electromagnetic incompatibility.*
- *Harmonic distortion.*
- *Mechanical impact (vibration levels exceeded, others).*
- *...*

4.2.5 Protection of the battery system

HAZARDS to address:

- *Mechanical impact damaging the battery.*
- *Battery exposed to non-design environmental conditions (temperature, humidity, etc.).*
- *Battery exposed to hazardous external factors such as fire or flooding.*
- *...*

4.3 Containerised battery systems

4.4 Monitoring and alarms

[4.5 Operations and training

4.5.1 Shore-side battery charging

4.5.2 Handling containerized batteries]

5 SUPERCAPACITORS

6 OTHER [SPECIFIC] PROVISIONS

ANNEX II

This Annex provides a preliminary set of definitions. These definitions are solely for establishing a common understanding at the beginning of our discussion. References for existing definitions include the documents listed in paragraph 6.

The final list of definitions will be established upon completion of the work.

Terms and Definitions

[Electrical Energy Storage (EES)

Installation able to absorb electrical energy, to store it for a certain amount of time and to release electrical energy during which energy conversion processes may be included.

Electrical Energy Storage System (EESS)

Grid-connected installation with defined electrical boundaries, comprising at least one electrical energy storage, which extracts electrical energy from an electric power system, stores this energy internally in some manner and injects electrical energy into an electrical power system and which includes energy conversion equipment and related ancillary equipment.]

Definitions relevant to Battery Energy Storage Systems

Battery cell

The basic functional unit in a battery constituted by electrodes, electrolyte, active materials (such as lithium and cobalt), separators if applicable, container and terminals. A 'secondary battery cell' can receive, store, and deliver electrical energy through chemical energy storage within its internal components.

Battery Energy Storage System (BESS)

A rechargeable battery with internal storage specifically designed to store and deliver electric energy into the grid, which includes battery modules, packs, electrical interconnections, means of isolation, cooling system (as appropriate), battery management system and other safety features.

Battery Management System (BMS)

Electronic system that controls, manages, detects, calculates electric and thermal functions of the battery system and provides communication between the battery and upper-level control systems. It monitors the state of the battery and protects the battery from operating outside its safe operating area. (In EMSA battery Guidance and

Battery module

An assembly of battery cells electrically connected which includes a monitoring circuitry and may include protective devices.

Battery pack

An energy storage device comprising one or more electrically connected cells or modules. The battery pack can include protective housing, protective devices and control and monitoring systems in communication with the battery management system. A battery pack can be used as stand-alone unit when a battery management system is integrated in the pack.

Battery room

Dedicated space where the Battery Energy Storage System is installed.

Battery space

A ship's space not exclusively dedicated to Battery Energy Storage System.

Battery string

A number of cells or modules connected in series with the same voltage level as the battery system.

Battery Thermal Management System (BTMS)

System that regulates the temperature of the batteries within the range specified by the manufacturer. *Note:* for the purpose of these guidelines BTMS has to be understood as the system built-in the battery case or rack and it should not to be confused with the ship-board HVAC system.

Cell balancing

Passive and/or active techniques that redistribute charges between battery cells to maintain equivalent state-of-charge of every cell.

Energy Management System (EMS)

Integrated system that provides information and manages the flow of energy in a Power System looking to safety, function, and operating modes. It collects energy measurement data from the field and makes it available for information through graphics, online monitoring tools, and energy quality analysers.

Hazardous area

Means an area in which an explosive and/or toxic gas atmosphere is or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of equipment.

Lithium-ion cell

Cell where electrical energy is derived from the insertion/extraction reactions of lithium ions or oxidation/reduction reaction of lithium between the negative electrode and the positive electrode.

Off-gas

The gas released by the battery cells during an abnormal incident, constituted by thermal runaway exhaust gas such as vaporised electrolyte.

Power Management System (PMS)

An electronic system to control the power production, distribution and load calculations of the ship ensuring that power capacity is line with demand at any time. The PMS integrates all sources of energy production and consumption, and controls all associated sub-systems such as the electrical main distribution line, prime movers, energy storage systems, propulsion, and main consumers.

Rated capacity

The total number of ampere-hours (Ah) that can be withdrawn from a fully charged battery under reference conditions. Error! Bookmark not defined.

State of charge (SoC)

A measurement of the amount of energy left available in a battery pack or system in a specific point in time expressed as a percentage of rated capacity. It provides information on how long the battery can perform before it needs to be charged or replaced.

State of health (SoH)

A measure of the general condition, including state of safety, and performance of a rechargeable battery compared to its initial condition.

Thermal runaway

The condition of accelerated increase of temperature by self-heating, where the rate of heat generation within a battery component, typically larger than $>80\text{ }^{\circ}\text{C}$ or $1\text{ }^{\circ}\text{C/s}$, exceeding its heat dissipation capacity.

Venting

The operation of release of excessive internal pressure from a cell/battery as intended by design to prevent rupture of the case or explosions. or upon release of toxic gases or smoke.

Definitions relevant to supercapacitors**Electrochemical capacitor or Supercapacitor**

An electric energy storage device where an electrical charge is stored as a result of non-Faradaic processes at one or both of the electrodes.

Supercapacitor Cell

The basic electric energy storage unit inside of a supercapacitor system, which contains an assembly of electrodes, electrolyte, separator, and current collectors.

Supercapacitor energy storage systems (SCESS)

Electrical energy storage system with accumulation subsystem based on supercapacitor cells. SCESS includes one or more supercapacitor cells/modules/packs with Supercapacitor Management System, ancillary devices, and protective components.

Supercapacitor Cell String

A number of supercapacitor cells or modules connected in series to achieve a large voltage level of the supercapacitor system.

Supercapacitor Module

A group of supercapacitor cells connected together in a series and/or parallel configuration with or without protective devices and monitoring circuitry.

Supercapacitor Pack

Energy storage device that is composed of one or more supercapacitor cells or modules electrically connected. It has monitoring circuitry that provides information to a supercapacitor energy storage system.

Supercapacitor Management System

A supervision system that contains control, monitoring, balancing, and protective functions of the supercapacitor energy storage system. It monitors and/or manages its state, calculates secondary data, reports that data, and/or controls its environment to influence the supercapacitor's safety, performance, and/or service life.

Supercapacitor room

Dedicated space where the Supercapacitor Energy Storage System is installed.

Supercapacitor space

A ship's space not exclusively dedicated to Supercapacitor Energy Storage System.

Supercapacitor Cell Balancing

The mechanism of forcing all supercapacitor cells within a supercapacitor module to have identical voltages. Cell balancing is achieved by means of a “balancing circuit” (usually implemented as part of the Supercapacitor management system). Without a balancing circuit, one or more cells (as a result of different internal equivalent series resistances) may become undercharged or overcharged, either of which can lead to a failure of the capacitor module. Supercapacitor cell balancing is not an instantaneous process and requires a period of time before cell voltages are balanced.

Supercapacitor - State of Charge (SOC)

Available capacity in a supercapacitor cell/module expressed as a percentage of rated capacity.

Supercapacitor - State of Health (SOH)

An indication of the general condition of a supercapacitor cell/module compared to its ideal conditions. The unit of SOH is expressed as a percent Number.

ANNEX III

Suggested Terms of Reference for the correspondence group proposed to be established at SSE 12

.1 Agree on an initial structure of the interim guidelines suitable to address the relevant gaps and barriers to fixed on-board lithium-ion batteries, containerised batteries and supercapacitors as listed in MSC 110/WP.9 Annex 4.

.1 on the basis of MSC 109/WP.9, commence the work on the Interim Guidelines for battery energy storage systems and for supercapacitors for maritime applications;

.2 advise the Sub-Committee on the need to consult other relevant sub-committees;

.3 convene remote meetings using a suitable platform in order to consider any of the terms of reference, as necessary, for further progress the work; and

.4 submit a written report to SSE 13.