

IEEE Power and Energy Society Entity Annual Report 2025

Entity: Marine Systems Coordinating Committee (MSCC)
Website: <https://ewh.ieee.org/cmtc/pes/msc/>
Chair: CDR Dwight Alexander, USN (RET), PE, SMIEE
Vice-Chair: Prof. John Prousalidis
Secretary: Prof. Federico Silvestro
Immediate Past Chair: Paul Bishop

1. Significant Accomplishments:

- After the rebooting in October 2020, during 2021-2024 we campaigned to both re-connect with former members and recruit new members.
- The new edition of ESTS was held August 6-8, 2025 in Washington DC, USA (<https://ests.mit.edu/>). The Organizing Committee approved the organization of a special session related to MSCC fields of interest on the second day of the conference (August 7th). The panel session entitled “Treating sustainable electrification in the maritime sector” was moderated by Dr. John Prousalidis. Panelists were: Professor Chris Hodge (IMarEST), Professor Anna Stefanopoulou (University of Michigan), Mr Rudi Schubert (IEEE-SA), Dr Harish Suryanarayana (ABB), Mr Perry Haymon (Hii).
- In parallel, a number of tutorial-webinars are under discussion; most of them relevant to IEEE 45 standards family (Recommended Practice for Electrical Installations Shipboard) developed and maintained by the IEEE Industrial Applications Society (IAS) Petroleum & Chemical Industry Committee (PCIC). The MSCC members work closely with IAS/PCIC on the IEEE 45 family of recommended practices.
- Activities of WG’s: (1) IEEE 45.3 (Systems Engineering) the document successfully balloted and published, (2) IEEE 45.7 (Switchboards) has been approved in 2024 and work is in process; (3) finally, the PAR of IEEE 45.5 () has been approved and work started in December 2025 is in process.
- MSCC had a meeting within PESGM (July 26-31, Dallas, Texas) on July 28th; this meeting acted as a brainstorming gathering and helped collecting many ideas to shape the strategy of upcoming years where electrification of the maritime sector will predominate.
- Communication with other PES-technical and coordinating committees (and other organizations) has started since MSCC’s charter aligns with their interests (see below); e.g., classification societies, International Organizations, other Institutes.

2. Benefits to Industry and PES Members from the Committee Work:

As a Coordinating Committee, MSCC provides the interdisciplinary expertise of marine electrical power engineering to the maritime industry (especially relevant now as increasing marine platform / vessel electrification is being incorporated to address a myriad of specific technical issues for platform / vessel performance) taking advantage of the work and outcome of other Committees more dedicated to general

electrical engineering disciplines (e.g., T&D, ODSP). Certain standards closely coupled to the MSCC (e.g., IEEE-45 Series, IEEE 1662, IEEE 1709, IEEE 1826, and IEC/ISO/IEEE 80005) are well recognized by the maritime community as extremely useful, while new challenges are always emerging. Moreover, IEEE-SA having recognized the great interest in the maritime sector and in late 2021 launched an Industry Connection Activity entitled “Sustainable Maritime” (ICA-013-22) encompassing all topics of MSCC that could be further cultivated in a more innovative manner. Within this context, starting from early 2023, MSCC and ICA-013-22 have run in parallel. Last but not least, a new Task Force comprising young professionals dedicated to investigating and studying e.g. via simulations modern challenges in the maritime industrial sector.

3. Benefits to Volunteer Participants from the Committee Work:

The Volunteer Participants can both raise issues and work to develop solutions to marine electrical power problems. Despite the fact that most members come from the industry vice academia and have less free time to devote, their participation will prove beneficial due to the easy and efficient collaboration with other industry, academic and government experts around the world who share similar thoughts and face similar challenges in the maritime business.

4. Recognition of Outstanding Performance:

- *Dr. Norbert Doerry, for his contribution to amending IEEE 45.3 and 45.5*
- *Mr. Moni Islam, for his contribution to keep incentivizing people to get involved within MSCC activities and for his contribution to amending IEEE 45.7.*
- *Professor Fabio D’Agostino for being a most successful liaison between MSCC and ESTS Conference*

5. Coordination with Other Entities (PES Committees, CIGRE, standards, etc.):

As already mentioned, the ‘Coordinating’ role of MSCC seems to be substantial and critical. There is a strong interest to face challenges related to electrical engineering in the marine sector (not necessarily limited to power but also to communication, control, cyber-security, big-data, IoT, blockchain, etc.) that many entities have expressed their interest to either attend via delegates (e.g., classification societies like ABS, LRS, RINA, BV, DNV).

Updating the IEEE Industry Applications Society (IAS) Petroleum and Chemical Industry Committee (PCIC) IEEE 45 Series had significant progress. Having as a background the successful completion of the amendments of IEEE 45.1 (Design) and 45.2 (Control Systems), IEEE 45.3 (Systems) completed balloting in early 2025, while the IEEE 45.7 (Switchboards) Working Group continues their update. Moreover, there has been a strong interest in accelerating the work of IEEE/IEC/ISO 80005 (work on shore side electricity run by JWG 28). Finally, some MSCC work (e.g., on DC distribution or on electrification of maritime transportation) has been useful in the IEEE European Power Policy Committee in the preparation and/or amendment of policy documents related to challenges emerged due to the decarbonization.

The Work done within MSCC is closely related to the new initiative within IEEE entitled “Alternate Energy and Storage”.

6. New Technologies of Interest to the Committee:

Technologies related to environmental friendly shipping such as:

- Earthing / Grounding in ships and ports
- Smart grids in ships and ports
- AC and DC ship-to-shore interconnection
- Corrosion and cathodic protection in ships and ports in view of shore-ship interconnection
- Medium voltage DC distribution in ships
- Frequency converters dedicated to ship-to-shore interconnection
- Renewable energy sources (RES) and energy harvesting techniques deployed at sea
- Grid forming capabilities in the port distribution networks
- Digital twinning of port and ship systems
- Exploitation of real time domain simulator to validate performance of ship or port electrification via Hardware in the Loop (HIL) processes
- Efficient submersible interconnections (for islands, or for offshore and near-shore RES plants).

7. Global Involvement

PES is looking to increase involvement with members from Regions 8, 9 and 10 (Africa, Europe, Middle East, Latin America, Asia and Pacific).

Total Number of committee members	Officers from regions 8,9 and 10	Subcommittee officers from regions 8, 9 and 10	Subcommittee members from regions 8,9, and 10
Officially 90 but about 35 active in 2025	The Vice chairman and the Secretary are from Region 8. In addition 4 representatives come from Region 8	<i>Subcommittees have not been activated.</i>	<i>Subcommittees have not been activated.</i>

8. Problems and Concerns:

Continuing relevance and participation in MSCC activities will be driven by convening the committee on a regular basis to discuss relevant topics of interest to the members. To this end the MSCC will formally convene (about twice per year) via telephone / WEB-conference. Decoupling MSCC meetings from specific IEEE sponsored symposiums could ensure the maximum number of participants can attend. The WEBEX account provided officially by IEEE-PES will be fully exploited.

9. Significant Plans for the Next Period:

- Continue recruiting new members
- Set the framework of collaboration with other entities
- Continue supporting IEEE 45 Series updates when coordination across IEEE communities.



- Trigger the discussions about new challenges which could result to new standards or updating existing ones. Within this frame, it is planned to organize webinars on related topics. For 2026, the hot topic selected has been “Port Electric Distribution Networks”

Submitted by:

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