

IEEE Power and Energy Society Entity Annual Report

2023

Entity: Marine Systems Coordinating Committee (MSCC)
Website: <https://ewh.ieee.org/cmte/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 2021-2023 we campaigned to both re-connect with former members and recruit new members.
- The most closely related IEEE Technical Conference is the Biennial Electric Ship Technology Symposium (ESTS) held August 1-4, 2023, in Washington DC (USA) (<https://ests.mit.edu/>). On August 1st, a tutorial was given by Dr. John Prousalidis (entitled “Supporting Sustainability in the Maritime Sector”). Additionally, a special plenary panel session (entitled on “Sustainable Ports”, at the opening of the Conference, August 2nd, 2023) on “Sustainable Maritime” issues was conducted. The panel plenary session was chaired by Dr. John Prousalidis with Mr. Rudi Schubert participating along with panelists: Prof. Fabio D’ Agostino, University of Trieste, Mr. Jim Andriotis, Cavotec sa, Prof. Daniele Bosich, University of Trieste, Prof. Jian Shi, University of Houston. Synergies with many other participants (from USA and Europe) were noted.
- Similarly, the new edition of ESARS-ITEC (after COVID pandemic) was held March 28-31, 2023 in Venice, Italy (<https://www.esars.eu/esars2023/>). We contacted the Organizing Committees of both conferences and organized a series of special and panel sessions related to MSCC fields of interest. One special paper session entitled ‘Sustainable Maritime’ was conducted on March 31st (with 8 papers presented with Dr. John Prousalidis co-chairman), while on March 29th a panel session entitled “Port Electrification” was moderated by John. Panelists were Mr. Anastasios Manos, CEO of HEDNO (the Greek DSO) and Mr. Luca LoSciavo, Deputy Director of ARERA (the Italian Regulating Authority of Energy). The session was joined by Mr. Damiano Landi of Terna (the Italian TSO), and Ms. Maria-Elena Perretti of CDP (the State-owned Investment bank of Italy). The maritime sector energy market models was the main subject of discussion.
- 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 45.1 (Design) concluded and the draft document successfully balloted and published, (2) the balloting process of the draft 45.2 (Controls) has been finalized; (3) the PAR for 45.3 has been approved in early December 2023, so the WG on 45.3 will begin its work; (4) finally, updates to 45.8 (Cables) is in process.

- 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. Besides other committees within PES, the Ocean Engineering Society (OES) and the OU of Smart Cities have expressed their interest for a closer cooperation. Several meetings of organizational nature have taken place via Tele / WEB-conference tools, which have been efficient in facilitating communication.

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/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 in late 2022 has launched an Industry Connection Activity entitled “Sustainable Maritime” (ICA-013-22) recognized 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.

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. Mohamed Belkhayat, Ms. Marie Lawson, Mr. Geoff Lowe for leading amending IEEE 45.2.*
- *Professor Julie Chalfant, Andy Lemmon, Dani Opila for organization ESTS 2023. Special tribute to Misha Steurer, co-chairman of ESTS who passed away a couple of weeks after ESTS.*
- *Dr. Norbert Doerry, for his contribution to amending IEEE 45.1.*
- *Mr. Moni Islam, for his contribution to keep incentivizing people to get involved within MSCC activities.*
- *Professor Giorgio Sulligoi for organizing ESARS-ITEC 2024 in Venice (Italy).*

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. Both IEEE 45.1 (Design) and 45.2 (Control Systems) successfully completed balloting. Both IEEE 45.1 (Design) and 45.2 (Control Systems), accomplished a substantial update in several sections. Moreover, there has been a strong interest in IEEE/IEC 80005, collaboration with IEC committees have been cultivated to some extent. 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.

6. New Technologies of Interest to the Committee:

Technologies related to environmental friendly shipping such as:

- Smart grids in ships and ports
- AC and DC ship-to-shore 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
- 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). Please provide the following information.

| 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 2022 | 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 tele-/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



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- 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.

Submitted by:

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John Prousalidis (IEEE/MSCC Vice Chairman)

Federico Silvestro (IEEE/MSCC Secretary)

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