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Call for Papers for the Special Session on

HYBRID ELECTRIC AND HYDROGEN-BASED MARINE PROPULSION AND ENERGY MANAGEMENT: FROM SHIPS AND AUVS TO DOCKING STATIONS

Organized and co-chaired by

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Technical Outline of the Session and Topics

The maritime sector is progressively adopting hybrid electric propulsion, hydrogen and fuel-cell technologies, and advanced energy management strategies to address efficiency and electrification challenges in ships, autonomous underwater vehicles (AUVs), and marine docking infrastructures. Recent studies show that hybrid architectures combining fuel cells, batteries, and supercapacitors, together with renewable energy-powered docking stations integrating offshore wind, electrolyzers, hydrogen storage, and battery systems, can improve energy efficiency, operational flexibility, and mission duration. These docking platforms are being studied and prototyped as autonomous microgrids capable of managing variable renewable generation and fluctuating marine loads. Energy management and system coordination remain central challenges, requiring rule-based, optimization-based, and data-assisted or learning-based strategies to ensure appropriate power sharing, fuel consumption reduction, battery lifetime preservation, and DC/AC grid stability under dynamic operating conditions. Building on these developments, this special session provides a focused forum on system architectures, modeling, control, energy management, and experimental validation for low-emission and energy-efficient maritime applications, covering ships, AUVs, and offshore charging and refueling infrastructures.

Topics of the session include, but are not limited to:

- Hybrid electric and hydrogen-based propulsion systems for ships and marine vehicles;
- Energy management of fuel cell, battery, and supercapacitor hybrid systems;
- Energy management strategies for electric ships and autonomous underwater vehicles;
- Marine docking stations and port microgrids for charging and refueling;
- Power electronics, DC/AC microgrids, and experimental validation for marine energy systems.

Timeline for Authors

All the instructions for paper submission are available on the conference website. Please visit www.iecon2026.org or scan the QR code for the timeline.