

Technical Meeting on "Industry 4.0 for Marine Engineers"

The Institute of Marine Engineers India (IMEI) Vizag branch organised a technical meeting in the Seminar Hall of the Marine Engineering Department, A.U. College of Engineering, Andhra University. The meeting featured a presentation by **Dr. Giri Rajasekhar Gunnu**, Professor of Practice in the Department of Marine Engineering at Andhra University, focusing on the significant advancements of Industry 4.0 in marine engineering, particularly marine machinery.



Presentation Overview

Part 1: Introduction to Industry 4.0 Dr. Gunnu began by emphasising the importance of Industry 4.0 for marine engineers. He provided an insightful overview of the evolution from Industry 1.0 to 4.0 and highlighted key technologies driving this transformation. The discussion covered:

- The impact and challenges of adopting Industry 4.0 technologies.
- Concepts such as Maritime 4.0, Shipyard 4.0, Shipping 4.0, and Port 4.0.

- The role of cyber-physical systems in data exchange within the industry.

Dr. Gunnu also shared publication trends in Maritime 4.0 from 2011 to December 2021 and trends in Digital Twin Technology literature from 2010 to 2022. He elaborated on how Digital Twin Technology can be applied within the maritime industry.

Part 2: Marine Machinery Maintenance In the second segment, Dr. Gunnu discussed the role of IoT sensors and devices in marine machinery and existing predictive maintenance techniques for asset management.

Part 3: Condition-Based Predictive Maintenance The final part of the presentation illustrated condition-based predictive maintenance using a motor as an example. Key topics included:

- Detecting classic faults in rotating machines such as unbalance, misalignment, mechanical looseness, and normal conditions.
- The role of signal processing techniques.
- The application of supervised and unsupervised machine learning approaches for predictive maintenance.



Dr. Gunnu's presentation was highly informative, providing valuable insights into the advancements and applications of Industry 4.0 technologies in marine engineering. His expertise and comprehensive coverage of the subject matter were greatly appreciated by all attendees. He also enlightened the audience about current IMO regulations and those set to come into force.

The session was well attended by Chairman **Dr. V.V.S. Prasad**, members of the Institute of Marine Engineers, and faculty and students of the Marine Engineering Department, Andhra University College of Engineering. The meeting concluded with the National Anthem.