iMélange

December 2024

Happy New Year

Monthly Magazine of The Institute of Marine Engineers (India)

The Institute of Marine Engineers (India)

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- Assessment, Examination and Certification of Seafarers ***Course Id – 1062*** (OFFLINE) – (12 Days) - 13th January 2025/ 17th March 2025
- Advanced Training for Ships using Fuels covered within IGF code ***Course Id – 5312*** (OFFLINE) – (5 Days) - 28th Jan 2025 / 10th Feb 2025 / 18th Mar 2025
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- ENGINE ROOM SIMULATOR MANAGEMENT LEVEL (5 DAYS) COURSE FOR MEO CLASS II (OFFLINE) – 2nd Jan 2025/ 27th Jan 2025/ 1st Feb 2025/ 24th Feb 2025/ 1st Mar 2025/ 26th Mar 2025/ 1st Apr 2025/ 25th Apr 2025/ 2nd May 2025/ 27th May 2025
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From the Editor's Desk

Dear Esteemed Readers,

As the year draws to a close, December invites us to celebrate milestones achieved, embrace the lessons learned and envision the horizon ahead. In this festive spirit, we present the year-end edition of iMélange, capturing the dynamic pulse of the maritime world and the enduring bonds that unite us.

Taking center stage this month was the **World Maritime Technology Conference (WMTC)**, a prestigious international event held in the first week of December. Bringing together global societies, this gathering underscored the imperative of advancing marine engineering and sustainability. The exchange of ideas and collaborations fostered here will undoubtedly shape a more resilient maritime future.

Equally significant was the **MSC 109 Meeting at IMO Headquarters**, where critical policy decisions were deliberated to fortify maritime safety, environmental stewardship, and operational efficiency. Being a part of this global dialogue was a privilege, reaffirming the power of collective action in navigating industry challenges.

In Mumbai, the IME(I) Mumbai Branch Webinar on **"Shipping Markets and Data"** delivered a wealth of knowledge on navigating market dynamics in today's data-driven world. Shortly after, the much-anticipated **Green Shipping Conclave 2025** was announced. Scheduled for 11th January 2025, this event promises to bring thought leaders together to strategize on building a climate-resilient maritime sector. Preparations are underway to ensure it serves as a springboard for actionable insights and innovation.

Meanwhile, in Kolkata, the **Future of Maritime Innovation Seminar** spotlighted cutting-edge technologies redefining marine engineering. The Chandigarh Chapter, in collaboration with MNOA, also made waves with an engaging debate and interactive event that inspired forward-thinking among attendees.

The **Chairman of IME(I), Mumbai Branch** addressed aspiring marine engineers during a seminar held at Chennai, sharing insights and experiences to encourage the next generation of professionals. These exchanges highlighted the importance of fostering dialogue and mentorship within the maritime community.

Seafarers were at the heart of the **ISWAN Seminar 2024**, which emphasized the importance of support, empowerment, and connection for the workforce that anchors the industry.

From technical insights in **Chilling Insights: Part II** on shipboard refrigeration to the launch of new industry-focused courses by IME(I) Mumbai Branch and MarinArch, this edition encapsulates the strides made in innovation and education.

As we bid farewell to 2024, let's carry forward the spirit of collaboration, resilience and progress into 2025. Your engagement and feedback have been the foundation of our journey and we eagerly await your insights at *editornewsletter@imare.in* by **7th January 2025.**

Wishing you all a joyful holiday season and a prosperous New Year!
May 2025 bring fresh opportunities, greater achievements and smoother sailing for us all.

SUNIL KUMAR
Honorary Editor – iMélange

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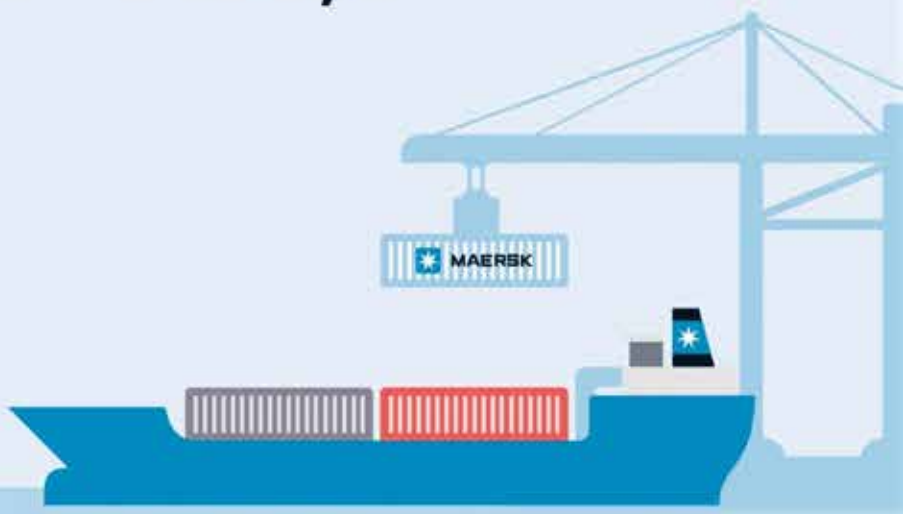

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Webinar Focuses on Data Insights for Shipping Markets

The Institute of Marine Engineers (India) Mumbai Branch successfully conducted a thought-provoking webinar on the topic "Shipping Markets and Data" on 30th November 2024. The session featured an expert presentation by **Dr. Satya Sahoo,** Assistant Professor of Shipping Management and Finance at the World Maritime University, Malmö.

The event commenced with opening remarks by **Ms. Sonali Banerjee,** an Executive Committee (EC) member of the IME(I) Mumbai Branch and the session moderator. Following this, the Chairman of the IME(I) Mumbai Branch, **Mr. David Birwadkar,** delivered a warm welcome address, highlighting the significance of the topic in today's dynamic maritime industry. Mr. Birwadkar also introduced Ms. Banerjee as the moderator, emphasising her trailblazing role as India's first female mariner.

Ms. Banerjee then introduced the distinguished speaker, Dr. Satya Sahoo, whose illustrious academic and professional background includes a Ph.D. in Finance, an MSc in Maritime Affairs and a Bachelor's degree in Marine Engineering. Dr. Sahoo, an alumnus of DMET, also has sailing experience with Fleet Management, making him exceptionally qualified to deliver insights on shipping markets.

Key Highlights of the Webinar

Dr. Sahoo provided a detailed analysis of the shipping industry's multifaceted nature, emphasising its characteristics:

1. **International Scope:**
   - A truly global industry governed by extensive international legislation.
   - Operates with numerous economic agents across borders, making it integral to world trade.
2. **Capital-Intensive Nature:**
   - High costs of entry and low barriers to exit, with varying entry thresholds in different sub-sectors.
3. **Competitiveness and Efficiency:**
   - A market-driven, cost-effective, and environmentally efficient mode of transport.
4. **Derived Demand:**
   - Freight rates are contingent on the transportation demand for commodities and goods.
5. **Volatility and Risk:**
   - The industry's inherent cyclicality, seasonality, and exposure to macroeconomic fluctuations pose significant challenges.

Dr. Sahoo elaborated on the technical considerations for shipping assets, covering dry bulk, wet bulk (tankers)

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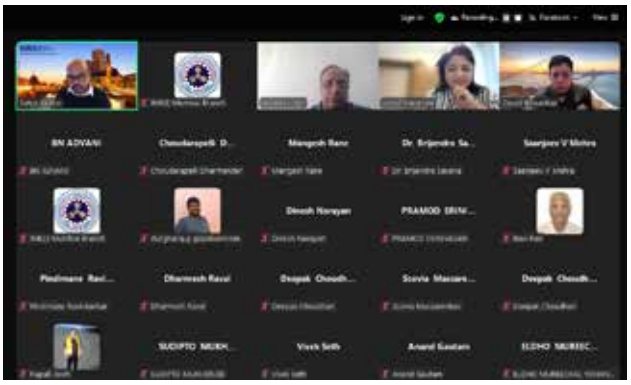


and container markets. He shed light on the commitment versus flexibility dichotomy in market operations and the unique characteristics of tramp and liner services.

In discussing shipping macroeconomics, Dr. Sahoo highlighted the interplay of demand and supply, noting how factors such as global economic growth, commodity trade and regulatory changes influence market dynamics. He also discussed the "Four Shipping Markets":

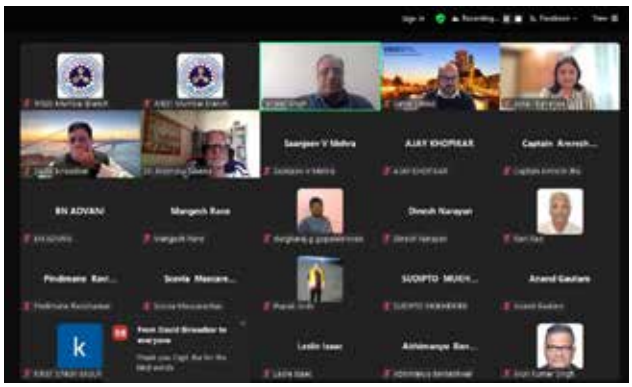
1. Freight Market
2. Recycling Market
3. Sale and purchase Market
4. Newbuilding Market

Dr. Sahoo underlined the importance of understanding fundamentals, macroeconomic drivers and timing for successful investments in the shipping industry.

The webinar emphasised the role of shipping as the backbone of globalisation, enabling specialisation and cost-efficient transportation of goods. Dr. Sahoo demonstrated how the industry facilitates international trade by overcoming geographic and economic barriers.

The session concluded with a lively Q&A segment, where attendees sought clarification and shared their perspectives on various topics. Ms. Sonali Banerjee provided a concise summary of the discussion, highlighting the takeaways for maritime professionals and stakeholders.

The Vice Chairman of IME(I) Mumbai Branch, **Mr. Ranjit Singh,** delivered the vote of thanks, expressing gratitude to Dr. Sahoo for his enlightening presentation and the audience for their active participation.



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Green Shipping Conclave 2025: A Step Towards Climate Resilience

In recognition of the magnitude of the Climate change challenges and the global ambition to expeditiously follow the deadlines set by International Maritime Organisation to decarbonise shipping, The Directorate General of Shipping (DGS) in collaboration with the Institute of Marine Engineers (India), Mumbai branch is holding the prestigious Green Shipping Conclave 2025 on 11th January at MCA Club, BKC Mumbai.

The Director General of Shipping, **Shri Shyam Jaganathan (IAS)**, while applauding the initiatives taken emphasised that the global shipping must rise to the occasion and take necessary action towards decarbonisation and green shipping solutions. The conclave will bring together Industry Leaders, Policy makers and all Stakeholders to discuss the latest advancements in technologies & alternative fuels, sustainable port operations and the financial mechanisms that will help in accelerating the transition.

The full day's conclave will have panel discussions and presentations by the luminaries and experts from the Indian and international Maritime Sector. As India asserts its leadership in global maritime decarbonisation efforts, this conclave aspires to provide a dynamic platform for shaping up the practical strategies and fostering cross country innovations.

Conclave is followed with the glittering and entertaining Annual Day function of the Mumbai Branch of the Institute of Marine Engineers (India) at the MCA Lawns.

Leadership Perspective on Green Shipping

It is with great pleasure that I extend my warm wishes to the Green Shipping Conclave 2025, organized by the Directorate General of Shipping in collaboration with the Institute of Marine Engineers (India). This Conclave reflects the Directorate's commitment to addressing climate change and environmental sustainability in the maritime industry.

The maritime sector, as a key enabler of global trade, must take decisive action towards green shipping solutions. The Government of India aligns with the global vision of achieving net-zero emissions by 2050, aiming to foster dialogue and innovation for this transformation through initiatives like this Conclave.

This Conclave gathers industry leaders, policymakers, and technologists to discuss advancements in alternative fuels, green ship technologies, sustainable port operations, and financial mechanisms. India, with its commitment to sustainability, is poised to lead green shipping on a global scale.

As you participate in the discussions, I encourage creative and collaborative efforts toward a sustainable future in maritime shipping.

Shri Shyam Jagannathan, I.A.S.

Director General of Shipping & Additional Secretary to the Govt. of India

As Chief Surveyor with the Government of India, I am honoured to join the efforts towards a sustainable and greener maritime industry. The Green Shipping Conclave is an essential platform for collaboration, and I am thrilled to see experts and visionaries gather to drive advancements in eco-friendly technologies.

Our commitment to green shipping is unwavering, and we aim to make significant strides in reducing the environmental impact of the maritime sector. Through innovative approaches and sustainable practices, we can set a benchmark for responsible shipping globally.

Together, let us work towards a cleaner, greener future for the industry, ensuring that our seas remain vibrant and productive for generations to come.

Shri Ajithkumar Sukumaran

Chief Surveyor-cum-Addl. DG (Engineering)

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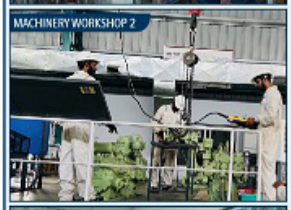
1. Advanced Training for Liquified Gas Tanker Cargo Operations	-	27 - 31
2. Engine Room Simulator - Management Level	16 - 20	-
3. Engine Room Simulator - Operational Level	09 - 11	06 - 08, 15 - 17
4. High Voltage Safety & Switch Gear Course (at Operational Level)	-	30
5. Refresher And Updating Training Course For All Engineers	-	20 - 22

Value Added Courses	December 2024	January 2025
1. Practical Marine Electrical (Basic) - Module 1	09 - 13, 16 - 20	06 - 10, 13 - 18
2. Practical Marine Electrical (Advance) - Module 2	09 - 11, 24 - 27	06 - 08, 20 - 22, 27 - 29
3. Electronics for Marine Engineers - Module 4	12 - 13, 30 - 31	09 - 10, 23 - 24
4. Instrumentation, Process Control & Programmable Logic Controllers - Module 5 & 6	16 - 20	13 - 18
5. Auxiliary Diesel Engine and Maintenance Course	09 - 13, 16 - 20	13 - 18, 20 - 24
6. Bridge Manouervering & Engine Control - Management Level	23 - 26	27 - 29
7. Bridge Manouervering & Engine Control - Operational Level	12 - 13	09 - 10
8. Hydraulics for Engineers - Basic	09 - 11	06 - 08
9. Hydraulics for Engineers - Advanced	16 - 20	13 - 18
10. Maritime Crew Resource Management (MCRM) - CAE Accredited	09 - 12, 30 - 03	06 - 09, 13 - 17, 27 - 30
11. Machinery Maintenance - Skill Enhancement - Module 2	16 - 20	13 - 18, 20 - 24
12. Machinery Maintenance - Skill Enhancement - Module 3	02 - 05, 09 - 12, 23 - 27, 30 - 03	06 - 09, 27 - 30
13. Machinery Maintenance - Skill Enhancement - Module 4	09 - 11, 26 - 28	06 - 08, 20 - 22, 27 - 29



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Launch of Advanced Courses to Equip Students With Modern Skills

The Institute of Marine Engineers (India), Mumbai Branch, is delighted to announce the launch of its newly introduced courses, designed to enhance learning and equip students with cutting-edge skills essential for success in today's competitive job market. These courses, developed in collaboration with MarinArch Training Academy, aim to address the evolving demands of various industries, ensuring our candidates remain at the forefront of their fields.

As part of this initiative, we are proud to share that a Memorandum of Understanding (MoU) has been successfully signed with MarinArch Training Academy on 21st December 2024. This partnership underscores our commitment to fostering collaboration between our organizations, paving the way for joint programs, research initiatives and resource sharing.

The MoU highlights our dedication to academic excellence and innovation, and we firmly believe that this collaboration will significantly benefit participants and the broader community. We eagerly anticipate the projects and initiatives that will emerge from this partnership.

We invite all interested parties to explore our new offerings and stay tuned for updates on upcoming events related to these initiatives.

Details of the new courses are as follows:

New Courses at IME(I) Mumbai Branch

Sr.No.	Course Name	Duration
1	ME Engine Course Simulator Training	5 days
2	Advanced Hydraulic Course	5 days
3	Ship Security Officer course	1 day
4	'Framo' Hydraulic Cargo Pumping System Course	3 days
5	Engine Room Simulator Refresher and Engine Room Team Resource Management	5 days
6	Risk management and Incident Investigation Course	2 days
7	Bridge Team Resource Management	5 days
8	Gender Sensitization Course	3 hrs
9	Mental Health for Seafarers Course	4 hrs
10	Chief Engineer Command Course	1 days
11	SIRE 2.0	1 days
12	'Framo' Hydraulic Cargo Pumping System Course (physical)	3 days
13	Engine Room Simulator Refresher and Engine Room Team Resource Management	5 days
14	Risk management and Incident Investigation Course (Physical)	2 days
15	Chief Engineer Command Course (Physical)	1 days
16	Gender Sensitization (Physical)	3 hrs
17	Mental Health Of Seafarers (Physical)	4 hrs

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- Candidates with relevant experience will be prioritized.
- Mention any applicable notice period.
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Website: https://imare.in/

Technical Paper Competition Showcases Advancements in Marine Technology

The Institute of Marine Engineers (India), Kolkata Branch organised a Seminar and Technical Paper Competition on 23rd November 2024, at IMU Kolkata Campus, for B.Tech students (3rd and 4th year) of all Indian Universities. The theme of the seminar was 'Advancements in Marine Technology'. Ten teams of Indian Maritime University (Kolkata Campus) (Erstwhile DMET) and one team each from IMU, Visakhapatnam Campus and The Neotia University, Kolkata presented technical papers on various modern topics like digital technology in shipbreaking and shipbuilding, sustainable propulsion, energy efficiency etc. The presentations were very informative.

The Chief Guest, **Shri Amitava Ghosh,** veteran industrialist (former President, Om Metals, and former Sr. Vice President, Texmaco), in his address, enlightened the audience on advancements in technology related to shipping, general engineering and energy sector. He explained the role of general engineering in shipbuilding and ship operation.

The Guest of Honour, **Dr. Nishith Ranjan Mandal** (Chair Professor Fellow, IIT Guwahati, and Ex- Professor, IIT Kharagpur), author of several books on welding technology, in his speech, advised the participants that knowledge of the shipbuilding industry, in addition to ship operation, would be helpful for their growth in the management sector of the shipping industry in future. He reminded the participants that, during their present training, they are being equipped with the ways and means to acquire knowledge, even in the future, and that they should make good use of the same.

The Patron of the ceremony, **Rear Admiral Amit Bose (IN Retd) VSM,** Campus Director of Indian Maritime University, Kolkata Campus, in his address, advised all cadets to participate more and more in this kind of seminars and competitions, for expanding the horizon of their knowledge.

The Chief Judge for the occasion, **Shri A. K. Das,** Managing Director, Marine Education Charitable Trust, in his speech, cautioned the cadets that only theoretical knowledge would not make them successful engineers. They needed to give prime importance to the practical aspect of ensuring safety of life.

There were five technical papers presented in the final stage of the Seminar. A team from Indian Maritime University (Kolkata Campus), led by Cdt Niranjan H. L., won the Dr. D. N. Sarkar Memorial / First Prize for its paper 'Sustainable Marine Propulsion - For a Better Tomorrow'. Another team from Indian Maritime University (Kolkata Campus), led by Cdt Rajdeep Das, won the Late U. N. Saha Memorial / Second Prize for its paper 'Shipbreaking 4.0: Leveraging Digital Technologies for Enhanced Efficiency and Environmental Compliance'. A team from The Neotia University, Kolkata, led by Cdt Pratyay Sarkar won the Third Prize for their paper 'Advancements in Hull Design and Manufacturing'.

Dr. Malini Shankar, (IAS), Vice Chancellor, IMU, in her message, stated "..... I am certain that the competition will motivate the aspiring marine engineers to augment the passion for their chosen field ....."

Chairman, IME(I) Kolkata Branch, **Shri Gautam Sen,** inaugurated the seminar by welcoming all dignitaries and guests.

Programme Coordinator, **Shri S.K. Sarkar,** EC Member, IME(I) Kolkata Branch, conducted the proceedings.

GC Member, IME(I) Kolkata Branch, **Shri S.K. Saha,** proposed a vote of thanks, to conclude the event.

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FACULTY

LOCATION

HIMT Kilpauk/Tidal Park/Kalpakkam

Masters/Chief Engineers

- Tanker Experience is preferred.
- Prior Teaching Experience is preferred.
- Experience in Simulator Training is preferred.
- Chief Engineers competent to teach electrical topics.
- Willingness to take both Competency & Revalidation courses.
- Age below 55 years would be preferred.
- Masters/Chief Engineers with no teaching experience and above 55 years can also apply.

SALARY: As per Industry Standards

Interested applicants can send a mail to

careers@himtmarine.com

Quality Training | Commitment | Professionalism

Future of Shipping Explored Through Debate and Keynote Insights

The IME(I) Chandigarh Chapter, in collaboration with the Merchant Navy Officers Association (MNOA), successfully hosted an impactful event on 3rd December 2024, at Hotel Chandigarh Beckons. The event brought together maritime professionals, academicians and industry leaders for an afternoon of insightful discussions, knowledge sharing and spirited debate.

The event reflected the organisations' commitment to fostering collaboration and innovation within the maritime and shipping sectors.

Event Highlights

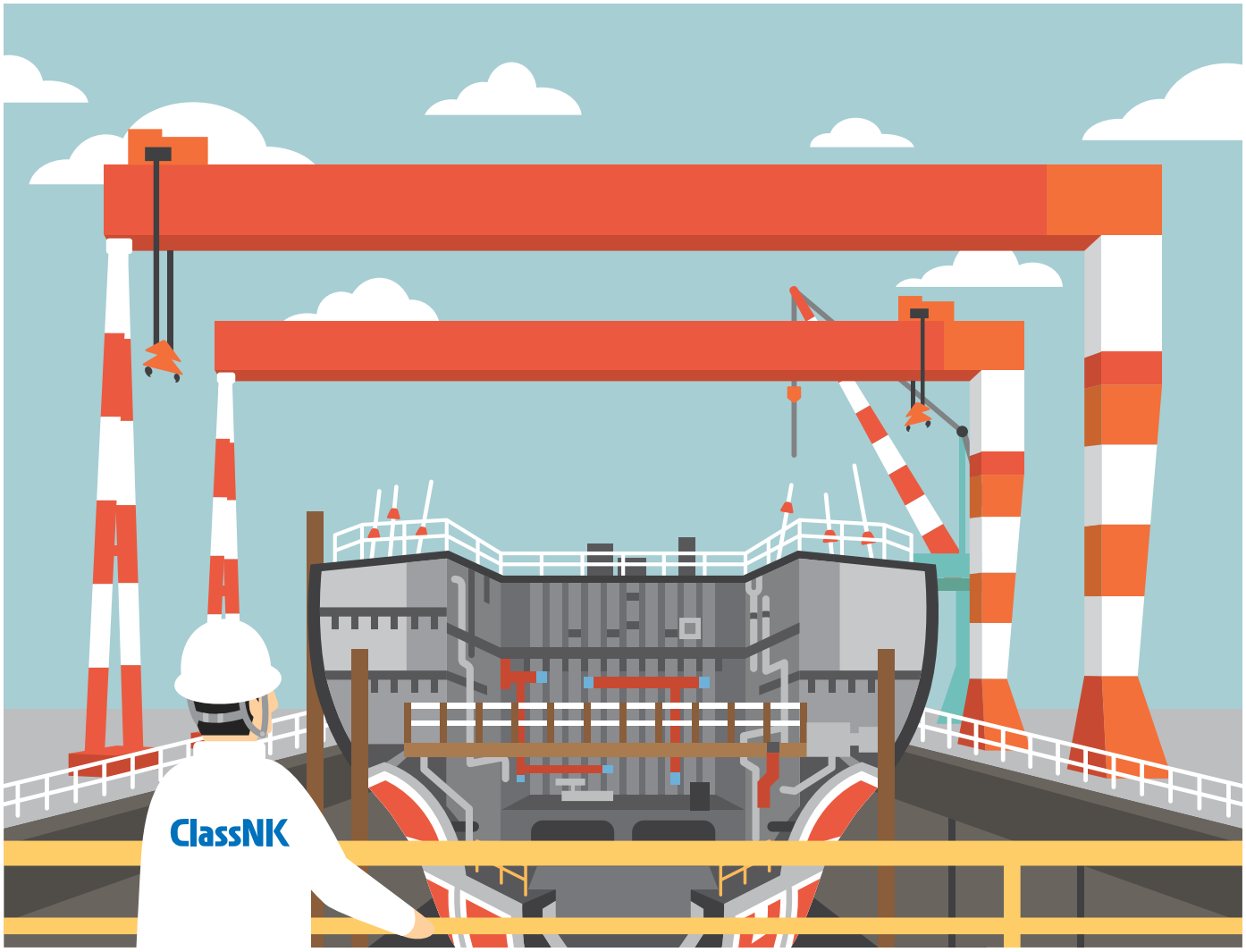
1. **Presentation on Executive MBA Programs** The event commenced with a presentation by Fellow Member **Mr. Jagmeet Makkar**, who provided an update on the Executive MBA programme offered by CMMI and IIM Mumbai's Executive Education initiative.
2. **Keynote Address by Commodore R.K. Das (Retd.) Cmde. R.K. Das (Retd.)** delivered a compelling keynote address on *"Geopolitical Situations and the Role of the Indian Navy in Supporting the Shipping Industry."* The address highlighted the critical intersection of maritime security and global commerce in today's complex geopolitical landscape.
3. **Debate: The Future of Shipping and Globalisation** The central highlight of the event was a stimulating debate on the motion: *"This house believes that the future of shipping is highly reliant on globalisation as we know it, and President-elect Mr. Donald Trump would help bring discipline to the world order, further promoting globalisation and hence shipping."*

- **For the Motion (Team Alpha):** Mr. Pawandeep Singh and Capt. Jaswinder Singh
- **Against the Motion (Team Beta):** Mr. Nityanand Bhardwaj and Mr. Rajeev Kaushik
- **Audience Presentations:** Mr. Varun Kant and Capt. Karamjit Singh Sujlana

The debate, moderated by Mr. Jagmeet Makkar, began with his opening comments on the critical challenges facing the shipping industry. These included climate change, geopolitical risks, evolving regulatory landscapes, decarbonisation pressures and cybersecurity threats. His remarks set the stage for a thoughtful and lively exchange of ideas.

Following a spirited discussion, **Team Beta** successfully swayed audience votes, arguing against the motion with compelling points on the changing dynamics of globalisation and its implications for the maritime sector.

The event concluded with a vote of thanks by **Mr. Arun Agrawal**, Chairman of the IME(I) Chandigarh Chapter. Participants then enjoyed a High Tea session, providing opportunities for further networking and informal discussions.



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India Actively Engages in Maritime Safety Reforms at MSC 109

The 109th session of the Maritime Safety Committee (MSC) was held from **2nd Dec to 6th Dec 2024**, with significant developments in maritime safety regulations and international standards. This document summarizes critical agenda items, enforcement dates and new rules adopted during the session.

Key Decisions and Adoption of Amendments

Adoption of Amendments to Mandatory Instruments

1. **International Code for Safety for Ships Carrying Liquefied Gases in Bulk (IGC Code):**

- Amendments enable the use of ammonia cargo as fuel, provided they do not include toxic cargo requiring carriage in 1G ships.
- Construction of liquefied gas carriers with ammonia fuel is now permissible.
- **Enforcement Date: 1st Jan 2026**, with voluntary early implementation encouraged

2. **International Code for Safety of Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code):**

- Amendments address fuel tank requirements, hazardous areas, and safe operations. Highlights include:
- Fuel Tank Design: Allowance for bottom suction wells and required non-return valves for safety.
- Ventilation: Revised standards for ducts in hazardous and non-hazardous spaces.
- **Enforcement Date: 1st Jan 2028.**

Development of a Safety Regulatory Framework for GHG Reduction

- The Committee established a Working Group (WG) to develop and update the list of alternative fuels and technologies.
- Member states and delegations were invited to submit proposals regarding the definition of low flashpoint fuel in SOLAS II-2/2.29 for future sessions.
- The Correspondence Group on the Development of a Safety Regulatory Framework for reducing GHG emissions using new technologies and alternative fuels was re-established.
- The WG endorsed the inclusion of a new category for "swappable traction lithium-ion battery containers" in the list of new technologies and requested the Correspondence Group to address gaps in recommendations on the topic.
- The Committee noted India's submission (MSC 109/INF.2) detailing the successful development, commissioning, and trials of India's first indigenously developed hydrogen fuel cell system and hydrogen-powered vessel.
- A by the Indian delegation on 5th Dec 2024, showcased these advancements and was well received by the attendees.

Revision of Maritime Cyber Risk Management Guidelines

- The Committee acknowledged the growing threats of cyberattacks in maritime operations, prompting a review of MSC-FAL.1/Circ.3/Rev.2.
- Target completion for enhanced guidelines is set for 2026, ensuring robust cybersecurity measures for ships and ports.

Navigation, Communications and Search & Rescue

- Distress Communication Costs: Approved a draft resolution on charges for distress, urgency, and safety communications via satellite services in GMDSS, replacing resolution A.707(17).
- IAMSAR Manual Updates: Approved amendments to the IAMSAR Manual for its 2025 Edition, with ICAO concurrence.

- Digital Data Standards: Adopted performance standards for receiving safety and search-and-rescue information via MF and HF digital navigational data systems (NAVDAT).
- Satellite System Criteria: Approved new criteria for mobile satellite communication systems in GMDSS, replacing earlier resolutions A.1001(25) and MSC.1/Circ.1414.
- Pilot Transfer Standards: Approved amendments to SOLAS regulation V/23, improving standards for pilot transfer arrangements, effective from 1st Jan 2028.
- IALA Updates: Approved updates to:
  - Maritime Buoyage System (SN.1/Circ.297/Rev.1).
  - Risk Management Toolbox for navigation aids and vessel traffic services (SN.1/Circ.296/Rev.1).
- Radiocommunications Equipment: Approved guidance on the validity of radiocommunications equipment used on ships (MSC.1/Circ.1460/Rev.5).
- Universal AIS Standards: Adopted performance standards for universal shipborne automatic identification systems (AIS) for new installations, revising previous guidance (MSC.74(69)).

Carriage of Cargo and Containers

- The Committee approved two urgent matters from CCC 10:
- Draft MSC Circular providing Interim Guidelines for the safety of ships using ammonia as fuel.
- Draft amendments to the IGC Code, along with:
  - An associated cover page for the MSC resolution.
  - A proposal for the Secretariat to prepare a new consolidated version of the IGC Code incorporating all amendments since 2014, for circulation and adoption at MSC 110.

Implementation of IMO Instruments

- Harmonization efforts for safety protocols and consistent application across various IMO instruments were emphasized.

Goal-Based New Ship Construction Standards

- IACS Recommendation and updates are set for adoption by 2026 and implementation by 2028.
- The Committee urged inclusive consultations with stakeholders to address industry concerns effectively.

Maritime Autonomous Surface Ships

- Progress on developing a non-mandatory MASS Code was highlighted.
- A roadmap was adopted targeting the implementation of mandatory standards by 2032.

Formal Safety Assessment

- Revised guidelines for formal safety assessments (MSC-MEPC.2/Circ.12/Rev.3) were approved for improved rule-making processes.

Ship Systems and Equipment

- Updates included amendments to the HSC Codes, SOLAS regulations, and unified interpretations for life-saving appliances and hazardous areas.

Work Programme

Approved Urgent Submissions:

- - Development of a transition scheme for introducing digital technology

in Very High Frequency (VHF) voice communications

- Realizing the full potential of the S-100 Electronic Chart Display and Information System (ECDIS)

- The Committee approved MSC.MEPC.1/Circ.5/Rev.5 to ensure proposals for new work outputs are manageable and justified for committees and subcommittees.
- A "Group of Chairs" will conduct preliminary assessments of proposals before committee sessions to streamline decision-making.
- Circular provides formats and criteria for these assessments, offering clear guidelines for evaluating new proposals or expanding existing outputs.

Conclusion

The MSC 109 session marked significant progress in adopting amendments, revising guidelines and preparing for future challenges in maritime safety. By addressing pressing concerns like greenhouse gas emissions, cyber risk management and advanced navigation systems, the Committee showcased its commitment to advance global maritime standards.

List of Attendees

1. Capt. Abul Kalam Azad, Head of Delegation, Nautical Adviser, Directorate General of Shipping.
2. Shri Killi Mohana Rao, Representative, Principal Officer, Mercantile Marine Department, Chennai.
3. Shri Pradeep Sudhakar, Representative, Chief Ship Surveyor, Directorate General of Shipping.
4. Shri Praveen Nair, Representative, Surveyor, Directorate General of Shipping.
5. Shri Nebu Oommen, Representative, Ship Surveyor, Deputy Director General, Directorate General of Shipping.
6. Cdr. Sandeep Kumar, Representative, Senior Principal Surveyor, Indian Register of Shipping.
7. Mr. Lokanath Prasad Tripathy, Representative, Head QHSE, DPA and CSO, Greatship India Limited.
8. Mr. Sunil Kumar, Representative, Fellow, Institute of Marine Engineers, India.
9. Mr. Anish Sankarapillai, Representative, Deputy General Manager, Cochin Shipyard Limited.
10. Mr. Jathesh Chandra Gopinathan, Representative, Deputy General Manager, Cochin Shipyard Limited.
11. Mr. Mudit Mehrotra, Representative, Industry Representative, Indian National Student Association (INSA).
12. Mr. Jyotisman Dasgupta, Representative, Vice President, Arush Gas Technology Services LLP, and President, Institution of Naval Architects, India.
13. Mr. Prasad Nayak, Representative, General Manager, Anglo-Eastern Ship Management (India) Pvt Ltd.
14. Capt. Nitin Mukesh, Representative, Nautical Surveyor, Directorate General of Shipping.

15. Mr. Rajeev Nayyer, Representative, Fellow, Institute of Marine Engineers, India.

Presentation made on India's first indigenously developed hydrogen fuel cell system and hydrogen-powered vessel, built by Cochin Shipyard Limited in collaboration with KPIT Technologies and the Indian Register of Shipping, was successfully commissioned. Highlighted in an IMO report, hydrogen fuel cells are gaining traction in marine applications for their efficiency, reduced emissions, and quieter operation. This milestone marks a significant step towards sustainable maritime solutions in India.

Indian Ship Captain Avhilash Rawat Receives Maritime Bravery Award at IMO

Captain Avhilash Rawat received the 2024 IMO Award for Exceptional Bravery at Sea for his heroic efforts during a Red Sea rescue mission. Representing his crew aboard the oil tanker ***Marlin Luanda***, Rawat was honored at the IMO headquarters in London for their courage and determination in firefighting and damage control after a missile strike in January. Additionally, Captain Brijesh Nambiar and the crew of INS ***Visakhapatnam*** were commended for supporting the Marlin Luanda during the crisis.

WMTC: Uniting Global Societies for Advancing Marine Engineering and Sustainability

WMTC is a global confluence of various societies across the world (USA, UK, Germany, Denmark, Norway, Spain, Portugal, India, Singapore China, S Korea and Japan) involved in the learning of Marine Engineering, Naval Architecture, Science, Technology and Sustainability.

The World Maritime Technology Conference, WMTC 2024 has been conducted over 3 days, December 4th to 6th 2024 in the Hotel Leela Palace, Chennai, with a thought-provoking theme: "Global Shipping - A Battle for Survival or a Torch Bearer of Hope."

The conference had come back to India after 15 years, and the 2024 Conference was hosted by The Institute of Marine Engineers (India) – Chennai Branch. It was earlier hosted in Copenhagen (2022), Shanghai (2018), Houston (2015), St. Petersburg (2012), Mumbai in 2009.

WMTC 2024 was supported by a host of Sponsors, Exhibitors, Advertisers and donors from the maritime fraternity. The Institute places on record its gratefulness for such kindness and generosity.

The Plenary session in the evening of December 4th was capped with an address by the Chief Guest **Shri Shyam Jagannathan (IAS)**, DG and Addl Secretary, Shipping, Govt. of India, who also released the Conference Souvenir, featuring all the papers presented at the conference. **Shri Arun Sharma,** Executive Chairman, Indian Register of Shipping, the Strategic Forum Leader also spoke, along with other dignitaries from Lloyd's Register and DNV. The session was presided by **Mr Rajeev Nayyer**, the President of The Institute of Marine Engineers (India).

Prior to the Plenary Session, the conference featured two prominent panel discussions, coined "The White House" and "The Poseidon Senate."

"The White House" panel discussion was anchored by **Mr. David Loosely,** CEO & Secretary General of BIMCO (Baltic & International Maritime Council) and comprised a distinguished panel of experts, which focussed on a range of critical issues facing the Business leaders:

- **Ms Maren Moxon,** CFO, The Wallem Group
- **Shri Shyam Jagannathan (IAS)**, DG Shipping
- **Mr. Jonathan Andrews,** CEO Steamship Mutual P&I
- **Mr. Aditya Trehan**, MD Maersk Tankers, India

"The Poseidon Senate" panel discussion was anchored by **Mr. Tim Wilkins**, Deputy Managing Director of INTERTANKO (International Association of Independent Tanker Owners), which delved into the latest trends in the maritime industry, such as sustainability, crew welfare, technology, and regulatory developments.

- **Mr. Durga Das,** Founder, Aero Nero
- **Mr. Nikolaus H Schues.** President of BIMCO
- **Mr. Nils Kovdal,** CEO / Managing Partner of North Cape Capital
- **Mr. Sanjay Varma,** Director Head Decarbonisation Solutions, Wartsila

As a stress buster, the organisers arranged for **Shri Devdutt Pattanaik,** Author, Mythologist to speak before dinner, which turned out to be extremely engaging.

Over the 3 days, the conference featured more than 60 papers presented on various topics, with delegates from India and overseas participating in intense discussions, on subjects related to Technology, Markets and Insurance.

Speakers included **Dr Malini Shankar, IAS (Retd.), Capt Rahul Choudhuri, Mr. Anil Devli, Capt. Suresh Amirapu** and other eminent industry personalities.

The themes covered over the three days were:

1. Reforming (of Romancing) the Future – is Education better than Schooling?
2. Managing Learning – The Future of the Shipping world
3. Navigating the Future – Blockchain, Ai, Data Analytics and Digital transformation
4. The Connectivity Conundrum – Linking Rivers, Ports and Railways
5. Classification Society – A voice of influence
6. Managing Learning – what can Shipping learn from other industries
7. Shipping Markets – Can we predict the future?
8. Duty of Care – Safety Management and Crew welfare
9. Ship building and repairs – Can India grab a share of the market?
10. Managing and Hedging Risk – Asset, Cargo and Currency

11. Sustainable Development – Is it only about Climate Change?
12. Technical innovations – Marine Applications
13. Ocean Governance & Energy Transition
14. Cost leadership in Maintenance
15. Advancements in Product Technologies – Fuels, Lubricants, Paints and Chemicals
16. Powering Academic Research – Hulls, Propulsion Equipment, Vibration and Underwater noise

The Valedictory session held on December 6th was chaired by the Chief Guest, **Vice Admiral G Srinivasan,** AVSM VSM, Director General Naval Projects and the Guest of Honour, **Shri Amitabh Kumar, IRS (Retd.)** who spoke on the industry, its challenges and benefits to the world at large.

The conference concluded with a formal transfer of a traditional lamp from the incumbent, **Shri C V Subba Rao** to the next Conference Chairperson. **Dr Dina Pas Dimas** of the Portuguese Engineers Association. The conference now travels to Lisbon, Portugal where it shall be held in the summer of 2027.

The organisers place on record their gratitude to the Members of the Press for their unwavering sense of duty, courage and kindness.

Glimpses of the Event


WORLD MARITIME TECHNOLOGY CONFERENCE


WORLD MARITIME
CHENNAI, INDIA 2024


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WORLD MARITIME TECHNOLOGY CONFERENCE
CHENNAI, INDIA 2024
DECEMBER 4-6 WEDNESDAY, THURSDAY & FRIDAY


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CHENNAI INDIA 2024
DECEMBER 4-6 WEDNESDAY, THURSDAY & FRIDAY


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WMTC 2024


CHNOLOGY CONFERENCE

Maritime Professionals Gain Insights on Innovation and Excellence

The Maritime Foundation had the privilege of hosting **Mr. David Birwadkar,** Chairman, Student's Sub-committee and Chairman, The Institute of Marine Engineers (India), Mumbai Branch, on 11th December 2024. Renowned for his vast experience and leadership in the maritime industry, Mr. Birwadkar delivered an inspiring session, emphasising the critical role of IME(I) in empowering aspiring marine engineers and fostering professional excellence.

The event began with a warm welcome from **Capt. Ajay Gangadharan,** Principal of Maritime Foundation. Capt. Ajay expressed his heartfelt gratitude for Mr. Birwadkar's visit, recognising the significance of such interactions in shaping the aspirations of budding marine engineers. He highlighted the importance of industry leaders like Mr. Birwadkar in bridging the gap between academic learning and the dynamic realities of the maritime sector.

Drawing on over four decades of experience, Mr. Birwadkar shared insights from his illustrious career in marine engineering. He detailed his journey of driving innovation, tackling challenges and contributing to sustainable practices within the maritime industry. His engaging anecdotes inspired students to approach their careers with determination, a thirst for knowledge and a commitment to excellence.

The Benefits of IME(I) Membership

Mr. Birwadkar spotlighted the multifaceted advantages of IME(I) membership, encouraging students to leverage the opportunities provided by the organisation. He elaborated on the following key benefits:

1. **Industry Recognition**: Membership with IME(I) underscores expertise and dedication to maritime excellence.
2. **Professional Networking**: A gateway to connecting with industry leaders, policymakers and peers, fostering invaluable relationships.
3. **Comprehensive Learning Resources**: Access to journals, workshops and conferences ensures members remain abreast of emerging technologies and trends.
4. **Policy Influence**: Members actively contribute to shaping industry standards and regulations.
5. **Skill Development**: Exclusive programmes and events enhance technical and leadership capabilities.
6. **Student Support**: Tailored mentorship, discounted event access and exposure to industry insights prepare students for future challenges.
7. **Global Connectivity**: Cross-border collaborations broaden perspectives and deepen understanding of global maritime advancements.

Interactive Q&A Session

During the session, students engaged in a thought-provoking Q&A with Mr. Birwadkar. Key highlights included discussions on mentor assistance, technical support in a rapidly advancing marine industry, and IME(I)'s courses and services. Mr. Birwadkar explained how IME(I) equips members through workshops, certification courses and mentorship programmes, ensuring they stay aligned with cutting-edge advancements and industry needs.

The session concluded with a heartfelt vote of thanks from Capt. Gangadharan, who commended Mr. Birwadkar for his invaluable insights and dynamic presentation. Capt. Gangadharan emphasised the transformative impact of such engagements on students, highlighting Maritime Foundation's dedication to nurturing future leaders in the maritime sector.

This memorable event was a testament to the Maritime Foundation's commitment to fostering professional growth, personal development and a deeper connection to the ever-evolving maritime industry.

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RANKED GRADE A1 (OUTSTANDING)

D. G. Shipping Approved IGF Courses

★Basic IGF Course Id-5311

Basic Training for Ships using Fuels covered within

5 Days

★Advanced IGF Course Id-5312

Advanced Training for Ships using Fuels covered within IGF

5 Days

Course Dates:

Basic IFG: 06th January 2025 / 20th January 2025 / 03rd February 2025 / 17th February 2025 / 03rd March 2025 / 24th March 2025

Advanced IGF: 28th January 2025 / 10th February 2025 / 18th March 2025

Time: 8:30am - 4:30pm

Registration Link: https://imeimum.marineims.com/course/register

Glimpses of the Event

MEO CL-I (FG)	2 Months	02nd Jan 2025 / 01st Mar 2025 / 02nd May 2025	Rs. 30000/-	CLICK HERE
MEO (CEO – NCV)	2 Months	01st Mar 2025 / 01st July 2025 / 01st November 2025	Rs. 30000/-	CLICK HERE
MEO CL-II (FG) - NEW	4 Months	01st July 2025 / 01st September 2025 / 01st November 2025 / 02nd Jan 2025 / 01st Feb 2025 / 01st Mar 2025 / 01st April 2025 / 02nd May 2025	Rs. 40000/-	CLICK HERE
MEO (SEO – NCV) Part- A	2 Months	01st February 2025/ 01st August 2025	Rs. 28000/-	CLICK HERE
MEO (SEO – NCV) Part- B	4 Months	02nd May 2025 / 01st November 2025	Rs. 40000/-	CLICK HERE
MEO. CL-IV NCV	4 Months	02nd January 2025/ 01st July 2025	Rs. 36000/-	CLICK HERE
Diesel Engine Gas Combustion Simulator for MEO Class I	3 Days	2nd Jan 2025/ 6th Jan 2025/ 25th Feb 2025/ 1st Mar 2025/ 5th Mar 2025/ 28th Apr 2025/ 2nd May 2025/ 6th May 2025	Rs. 12000/-	CLICK HERE
Engine Room Simulator Management Level for MEO Class II	5 Days	2nd Jan 2025/ 27th Jan 2025/ 1st Feb 2025/ 24th Feb 2025/ 1st Mar 2025/ 26th Mar 2025/ 1st Apr 2025/ 25th Apr 2025/ 2nd May 2025/ 27th May 2025	Rs.14000/-	CLICK HERE
Engine Room Simulator Operational Level for MEO Class IV	3 Days	13th January 2025/ 17th February 2025	Rs.7500/-	CLICK HERE
Refresher Updating Training Course for all Engineers (RUCE)	3 Days	08th January 2025 / 20th January 2025 / 06th February 2025 / 20th February 2025	Rs.7000/-	CLICK HERE
Basic Training for Ships using Fuels covered within IGF code Course	5 Days	06th Jan 2025 / 20th Jan 2025 / 03rd Feb 2025 / 17th Feb 2025 / 03rd Mar 2025 / 24th Mar 2025	Rs.15500/-	CLICK HERE
Advanced Trg. for Ships using Fuels covered within IGF code	5 Days	28th January 2025/ 10th February 2025 / 18th March 2025	Rs.21500/-	CLICK HERE
Assessment, Examina-tion and Certification of Seafarers	10 Days	13th – 23rd January 2025 / 17th – 27th March 2025	Rs.15500/-	CLICK HERE

Interactive Session on Industry Knowledge and Professional Opportunities

On 11th December 2024, HIMT College had the privilege of hosting **Mr. David Birwadkar,** Chairman of the Institute of Marine Engineers India, Mumbai Branch. His visit was marked by an inspiring session aimed at highlighting the significance of IME(I) membership and its benefits for aspiring marine engineers. The event provided students with valuable professional insights while motivating them to explore opportunities for career and personal growth in the maritime industry.

The session began with a warm welcome by **Capt. Anand Subramanian**, Principal of HIMT College, who expressed his gratitude to Mr. Birwadkar for his visit. Capt. Subramanian emphasised the importance of such events in bridging the gap between academic knowledge and real-world maritime practices.

Session Highlights

Mr. Birwadkar delivered a comprehensive presentation focusing on the benefits of IME(I) membership. Key points included:

1. **Professional Credibility**: Membership with IME(I) serves as a hallmark of expertise and recognition in the maritime sector.
2. **Networking Opportunities**: Members can connect with senior engineers, industry leaders and policymakers, enhancing their professional networks.
3. **Access to Technical Resources**: Members gain opportunities to participate in workshops, technical discussions and conferences that foster a deeper understanding of emerging technologies.
4. **Policy Influence**: Active members can contribute to shaping maritime regulations and standards by participating in IME(I) committees.
5. **Skill Development**: Membership offers continuous learning resources and platforms for professional advancement.

Drawing from his extensive experience spanning over four decades in the maritime sector, Mr. Birwadkar shared his professional journey. His advocacy for innovation and sustainability, along with anecdotes about overcoming challenges, deeply resonated with the audience. He encouraged students to embrace excellence, resilience and forward-thinking in their careers.

Students had the opportunity to engage with Mr. Birwadkar through an interactive Q&A session. Notable questions and responses included:

- **Mock Interviews and Interactive Sessions**: Students requested mock interviews and hands-on sessions to build practical skills. Mr. Birwadkar appreciated the suggestion and assured them of future initiatives to incorporate such activities.
- **Support for Innovations**: When asked about technical support for translating ideas into innovations, Mr. Birwadkar confirmed that IME(I) provides resources and industry collaborations to help bring ideas to fruition.
- **Workshops**: Responding to a query on workshops, Mr. Birwadkar encouraged HIMT College to leverage its resources to conduct workshops, which would help students gain hands-on technical knowledge.

The event concluded with a token of appreciation presented to Mr. Birwadkar by Capt. Subramanian, symbolising the college's gratitude for his invaluable session. The visit was a resounding success, leaving students motivated and equipped with valuable insights for their professional journey in the maritime industry.

Glimpses of the Event

Seminar 2024 in India-Seafarers: Supported, Empowered, Connected

The ISWAN Seminar 2024 in India, hosted on 28th November at the Maritime Training Institute (SCI) in Mumbai, brought together key maritime stakeholders to address pressing challenges affecting seafarers and their families. Over 150 participants, including maritime leaders, policymakers, shipping executives, welfare organizations, seafarers, their families and academics, convened to explore topics ranging from discussions on family support, fraudulent crewing agents and the impact of decarbonisation on seafarers' well-being, alongside key launches and collaborative announcements.

The seminar started with a welcome address by **Shri Deepak Shetty, IRS (Retd.)**, *Former Secretary to the Government of India, Director General of Shipping, and ISWAN Trustee*, who emphasised the significance of industry collaboration in enhancing welfare initiatives. This was followed by addresses from distinguished guests:

Prof. (Dr.) Tanuja Kaushik, Dean of Academic Affairs, Gujarat Maritime University (GMU), emphasised the importance of addressing legal complexities in the maritime sector, particularly those concerning fraudulent crewing practices. She highlighted GMU's pivotal role in advancing maritime welfare research through initiatives like the GMU-ISWAN survey on fraudulent crewing agents. Prof. Kaushik also underscored the university's commitment to fostering collaboration between academia, industry and welfare organisations to create robust legal frameworks and promote ethical practices in the maritime domain.

Capt. J. C. Anand, Chairman Emeritus, the Indian Register of Shipping and the senior-most member of the Indian maritime industry at 103 years of age, captivated the audience with his address. He stressed the importance of training seafarers and upholding ethical practices in maritime operations and reflected on the industry's evolving landscape over the decades.

Mr. Rene Anderson, CEO, Sea Health and Welfare, spoke about the significance of holistic welfare approaches for seafarers. He highlighted the parallels between ISWAN's work and Sea Health's initiatives, emphasising collaboration for the well-being of maritime professionals.

Shri Shyam Jagannathan, IAS, Director General of Shipping, India, delivered the Chief Guest's address, focusing on regulatory measures designed to support seafarers. He spoke about the Directorate's commitment to digitising grievance redressal mechanisms and simplifying processes to ensure timely assistance for seafarers in need. He also mentioned the MOU with ISWAN as a testament to this effort.

Capt. Daniel Joseph, Nautical Surveyor-cum-DDG (Tech), Directorate General of Shipping, reinforced the Director General's vision, commending ISWAN for its welfare programmes. He emphasised India's proactive approach to ensuring maritime safety and support for its seafarers.

Commander Abeer Sharma, representing the Information Fusion Centre – Indian Ocean Region (Indian Navy), provided an operational perspective on maritime security. He addressed geopolitical challenges in West Asia, maritime threats and the importance of collaborative knowledge sharing between the Navy and the maritime industry. The session concluded with an engaging Q&A, offering deeper insights into India's maritime preparedness.

Panel Discussions

Family Support in Seafaring

This panel explored the importance of families in bolstering seafarers' mental well-being and resilience. **Moderated by Mr. Simon Grainge**, Chief Executive at ISWAN, the discussion covered strategies to strengthen family systems and the industry's role in addressing challenges faced by seafarers' loved ones.

Panellists: **Dr. Harish Shetty**, Senior Psychiatrist **Ms. Saleha Shaikh**, Founder & Head, MUI Women's Wing **Capt. Karan Kochhar**, Managing Director, Maersk **Capt. Sharad Kishore**, Master Mariner

The Impact of Recruitment Fraud on Indian Seafarers

Based on the GMU-ISWAN survey findings, this panel focused on the prevalence and consequences of fraudulent recruitment practices, featuring the testimony of Sumeet Vishwakarma, who shared his experience as a victim of such practices. **Moderated by Mr. Alexander Held**, Head of Commercial Turtle, the session highlighted legal, regulatory and educational interventions to protect seafarers from exploitation.

Panellists: **Capt. Manish Kumar**, Nautical Surveyor, Directorate General of Shipping **Dr. Mohit Gupta**, Assistant Professor, Gujarat Maritime University **Mr. Marville Espago**, Regional Manager, ISWAN Philippines **Mr. Sumeet Vishwakarma**, Seafarer

The Impact of Decarbonisation on the Welfare of Seafarers

This discussion addressed the complex challenges posed by the industry's shift towards decarbonisation. **Moderated by Mr. Rajeev Nayyer**, President of the Institute of Marine Engineers (India), panellists reflected on the balance between achieving environmental goals and ensuring the well-being and preparedness of seafarers.

Panellists: **Ms. Louise Hall**, Director of Loss Prevention, Corporate Responsibility and Marketing, The Shipowners' Club **Mr. Kaushik Seal**, Director, Slabs Consultancy Pvt. Ltd. **Mr. Karan Ahuja**, Chief Engineer **Mr. Chirag Bahri**, International Operations Manager, ISWAN

Launches and Partnerships-

Family Outreach Programme (FOP): ISWAN marked a milestone with the launch of the FOP in India, building on its success in the Philippines. After a trial phase in September 2024, the programme is now officially live and forms an integral part of ISWAN's Seafarers' Education and Awareness Session (SEAS) project. The FOP aims to provide comprehensive support to seafarers' families, recognising their critical role in the seafaring community.

GMU-ISWAN Research Report: In collaboration with Gujarat Maritime University, ISWAN launched a research report addressing the pressing issue of fraudulent crewing agents in India. The report provides actionable insights and recommendations to protect seafarers from exploitation, spotlighting the importance of ethical recruitment practices in the maritime industry.

MoU Signing with Tata Institute of Social Sciences (TISS): ISWAN and TISS formalised a significant partnership aimed at enhancing the mental well-being of seafarers and their families. The collaboration leverages TISS's expertise, including its iCall helpline—a free mental health support service available to all. This MoU underscores a commitment to creating meaningful mental health interventions for the maritime community.

Mr. Simon Grainge, Chief Executive at ISWAN, delivered the closing remarks, summarising the seminar's impactful discussions. He highlighted key takeaways from the day, including the focus on mental health, maritime security, decarbonisation's impact on welfare and the urgent need to address fraudulent recruitment practices. He appreciated the contributions of esteemed speakers for providing actionable insights. Mr. Grainge reiterated ISWAN's commitment to working collaboratively with industry leaders, government bodies and academic institutions to drive meaningful changes for seafarers and their families.

In his vote of thanks, Mr. Chirag Bahri, International Operations Manager at ISWAN, expressed gratitude to all participants, including esteemed guests for their invaluable contributions. He acknowledged the efforts of moderators and panellists from the day's sessions for fostering constructive dialogue. Mr. Bahri also extended heartfelt thanks to the sponsors and supporting organisations for their support and emphasised the importance of collective efforts in advancing seafarer welfare initiatives.

The seminar also featured an interactive app-based contest, with the winner receiving a Marshall Kilburn II Bluetooth speaker sponsored by Sailor Today Radio.

Acknowledgements

ISWAN extends its heartfelt gratitude to the sponsors, whose generous support made the ISWAN Seminar 2024 a resounding success:

Platinum Sponsor: Gujarat Maritime University

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Additionally, ISWAN acknowledges the contributions of the **Supporting Organizations**, which included: CMMI, NAUGHTICA-Offing Group, FOSMA, IME(I), INSA, MASSA, Maritime Training Institute (SCI), TURTLE and The Shipowners' Club.

This collective effort demonstrates the maritime community's shared commitment to enhancing the welfare of seafarers and their families.

Courtesy: ISWAN

Glimpses of the Event


TURTLE
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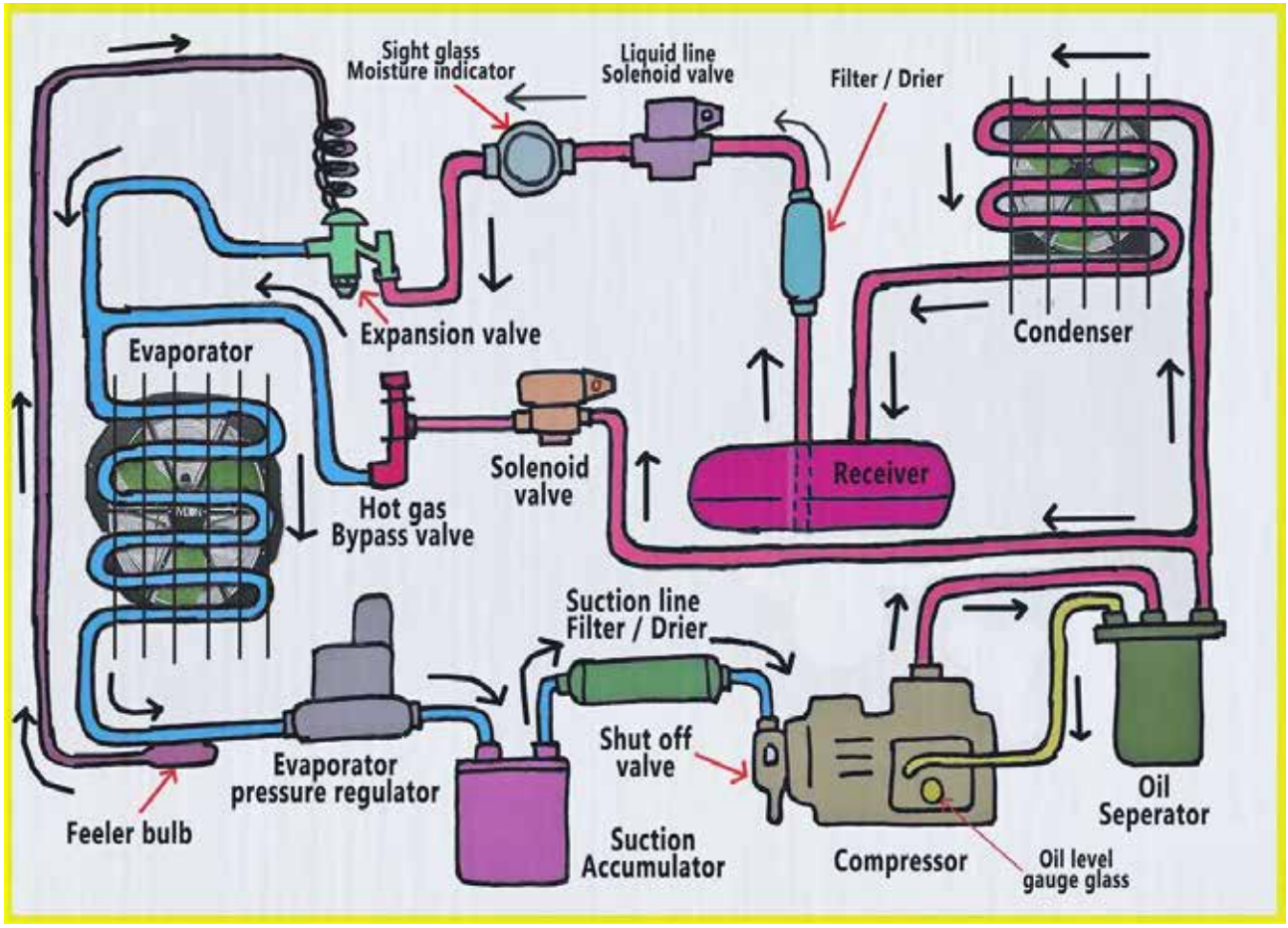
Chilling Insights: The Essential Role of Shipboard Refrigeration for Long Voyages (Part II)



During my sea going years, when there was a problem with the Fridge System, invariably many of the Engineers would do one or both of two things:

a. Clean the condenser and

b. Charge more gas into the system

Very few would take the time and make the effort to study the complete system minutely to diagnose where lay the problem.

Here I have made an effort to pass on my experiences with problems in the 'Fridge System, without going into too much detail.

Some of the more practical aspects of the 'Fridge Plant:

A quick summary of the state of the refrigerant at each stage and trouble shooting of defects: (We start at the compressor).

1. ***Refrigerant at suction side of compressor***: In cold, gaseous state. Ideal for it to be at a temperature where the suction pipe is frosting slightly.

   Compressor has three gauges - showing suction pressure, discharge pressure, lubricating oil pressure.

   Suction and discharge pipes have thermometers.

Compressor cuts in at a set pressure, assume 2.0 bar.

Compressor cuts out at a set pressure, assume 0.5 bar. Setting a very low cut out pressure may induce a vacuum, in case of a malfunction.

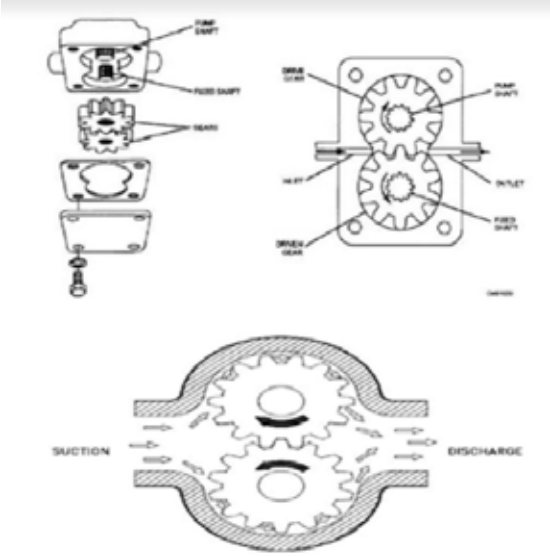
State of the Refrigerant when leaving Compressor: Gas at high temperature and around 16 to 18 bar pressure.

Likely Problems:

A. Heavy fluctuations on the Suction or Discharge pressure gauges is an indication of leaky (plate) valves.

B. The Lub Oil pressure gauge should show Suction Pressure + about 1.2 to 1.5 bar. If suction pressure is 0.8 bar, the LO Pressure should indicate about 2.0 bar, in which case sufficient oil is flowing to lubricate the main bearing, the con rod bearing, the gudgeon pin bearing and the liner.

C. When overhauling the 'fridge compressor motor, there have been incidents where the 440V cables have been wrongly connected, causing the attached LO Pump to rotate in the opposite direction, thereby not pressurising the oil sufficiently. After a while, the bearings get damaged. In this case, the LO pressure will be just 0.2 to 0.3 bar more than the suction pressure.



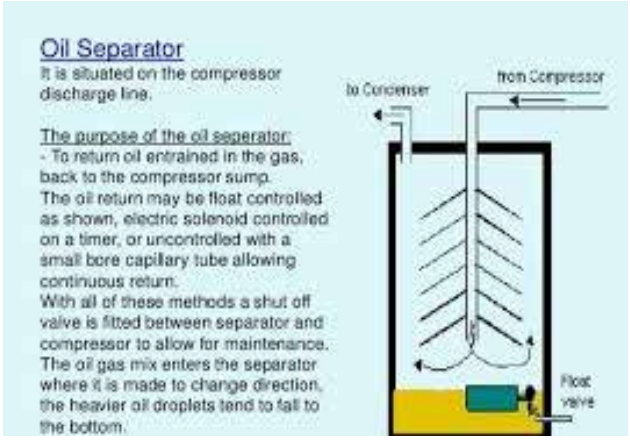
Imagine what would happen if the rotation of the Attached Lub Oil Pump is reversed

2.Oil Separator

Oil is not supposed to get carried over into the system.

Likely Problems:

A. If the Float Valve or the Solenoid valve are not working, oil will get carried into the refrigerant circuit. This will affect the cooling potential of the plant. Also, the oil combines with the bit of dirt in the system to form paste-like globules that, most of the time, stop traveling when they reach the Evaporator Coil, choking the line. Room temperatures go up.



B. The elements of the Separator can get dirty which, again , sends oil into the circuit.

C. If too much oil is being consumed by the compressor, the problem is, most likely, with the Oil Separator. In a fluently working system, there will be hardly any oil consumed. The only consumption would be when you change the compressor oil. Your maximum consumption should not be more than 1 or 2 litres every 3 months, depending on the size of the compressor.

State of the Refrigerant in the Oil Separator: Gaseous, high temperature, high pressure.

3. Condenser / Receiver

In some systems, the Condenser and Receiver are separate units. Most of the time, they are integrated into one unit.

Sea water or Fresh Water is the cooling medium for the condenser.

Ideally, here, all the refrigerant should turn from hot gas to liquid refrigerant at near room temperature.

Likely Problems:

Cleanliness of the Condenser

A. Whichever medium is being used for cooling, the condenser tubes should be kept clean. The dirtier the tubes, the less the transfer of heat (less cooling of the gas).

As the Sea Water temperature rises, so does the Discharge Pressure of the Compressor.

The reverse is also true. The Discharge Pressure of the Compressor goes down drastically with colder sea water temperatures.

It is important to maintain between 16 to 18 bar Discharge Pressure for reasons that will be explained later.

B. Under the circumstances of the Condenser tubes being dirty, the receiver sight glass will show very little or no liquid refrigerant. Since the gas has not changed state because of inadequate cooling, the Receiver will be filled with gas, rather than liquid.

The state of cleanliness of the condenser can be detected by

a. Condenser / Receiver hotter to the touch than on normal days.

b. No liquid refrigerant (or very little) can be seen in the sight glass of the receiver.

c. The Discharge Pressure of the Compressor can be seen to be higher than normal.

The mistake that the staff make, at this stage, is to charge more gas into the system, thereby overcharging the system.

Wait - first clean the condenser.

Ingress of Air into the System

A. Air ingress takes place due to

1. Shoddy methods of charging gas or
2. The gas in the bottle is from a dubious source and is adulterated or
3. Lots of air has entered the system during maintenance of valves or
4. Changing the silica gel of the Dryer or
5. Changing the compressor oil or
6. Cleaning the Oil Separator.

Air in the system will show up as High Discharge Pressure of the Compressor, sometimes leading to the HP Cut Out being operated, where the compressor trips.

This can happen despite a clean Condenser.

Ideally, the amount of gas charged into the system - determined by the liquid level of the Receiver - should maintain itself from around 3/8th of the sight glass to 3/4th of the sight glass.

The fluctuation in levels takes place with more rooms being cooled at the same time or less rooms being cooled.

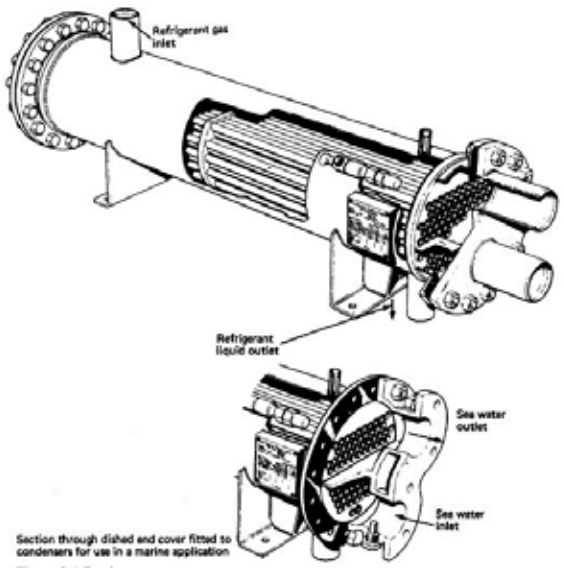
C. ***Removal of Air from the System:*** The air is bled out from one of the small valves provided for the purpose, on the Receiver.

All of it cannot be bled out during a single procedure.

As the plant continues to be in operation, the air in the system will slowly accumulate in the Receiver.

So the 'bleeding' operation should, desirably, take place over a 2 to 3 day period, watching the effects on the 'bleeding' , the result of which can be seen by watching the Discharge Pressure gauge - the pressure will start coming down slowly.

As per (Montreal) Protocols in place, this 'air bleeding' must not be done straight - directly - into the atmosphere. The gases + air has to be sent into a separate, empty bottle, to be disposed off as per your Company Instructions.



Drawing of Condenser Receiver----------
State of the Refrigerant in the Condenser / Receiver:
Enters as a gas at high temperature and pressure.

Gets cooled by the coolant - either sea water or fresh water.

Exits as a liquid at high pressure (slight drop in pressure due to it having expanded to a larger cylinder) ***and at near room temperature***

4. Drier / Filter - To aid in removal of moisture / water particles in the system:

Disposable Dryers

A Range of Refillable and Disposable Dryers

This Drier contains 'silica gel', a desiccant - a hygroscopic substance - that absorbs the moisture in the system, but allows the refrigerant gas to pass through.

The 'silica gel' will change colour from its initial colour to a different colour, depending on the manufacturer of the silica gel. (I have seen it turn from a crystalline white to a light golden brown to indicate that it is partially deactivated and then a crystalline blue showing it is reached its limit of moisture absorption)

Signs of Moisture in the System:

1. Some ships are fitted with 'moisture indicators'. (I haven't, personally, come across any).
2. Signs of slightly heavy to heavy frosting at the Evaporator Coils and at the suction of compressor.
3. Rooms will not cool to the set temperatures, causing the 'Fridge Compressor to run for longer periods than normal.

Maintenance of Drier : The 'silica gel' is normally changed every 3 to 4 month period or earlier if moisture is indicated. The system refrigerant is taken into the Receiver and a slight vacuum is purposely interposed into the line, so that no refrigerant gas bleeds out into the atmosphere when the drier is opened.

If too much of moisture is present in the system (sometimes happens if the refrigerant bottles are supplied from a spurious source - they may have added water into the bottle to attain the specified weight) the system may need complete draining, flushing with nitrogen and refilling.

Nowadays, use-and-throw (disposable) silica gel canisters are in vogue. The job of changing the silica gel is done in a matter of minutes.

State of the Refrigerant when it enters the Drier: Liquid at near room temperature, flowing at a pressure of around 16 bar. Moisture may be present.

State of the Refrigerant when it exits the Drier: Liquid at near room temperature, flowing at a pressure slightly lesser than when it entered the Drier. Leaves the Drier with lesser moisture, depending on the condition of the silica gel.

5. ***Liquid Line Solenoid Valve:*** Each room has one solenoid valve on its circuit. They are either fully open or fully closed. When the compressor runs, the coils of the solenoid valves are energised and the valves remains open and vice versa.

Problems that can occur with solenoid valves:

A. If, due to some fault, even if one of them remains permanently open, the liquid refrigerant in the line will slowly accumulate in that particular evaporator coil, thereby reducing the liquid level in the Receiver.

B. At this time, the error that the operator does is to charge more refrigerant into the system.

C. When the liquid level in the Receiver disappears, put off the compressor and check if any of the solenoid valves are stuck open.

D. Once the malfunctioning solenoid valve is made operational, accumulate all the refrigerant in the Receiver and then reactivate the plant.

State of the Refrigerant at the Solenoid valve: Liquid, at room temperature and high pressure, with hardly any change between inlet and outlet of solenoid valve.

If the Solenoid Valve gets iced up, it means that the liquid flow through the Solenoid Valve is not proper.

6. ***Expansion Valve - The most important and critical part of the entire circuit and the most sensitive.***

First, identify what type of Expansion Valve is there on your ship's Refrigerant Plant.

It can be any one of the following:

Capillary Tube

Electronic Expansion Valve (EEV)

Automatic Expansion Valve (AEV)

Thermostatic Expansion Valve (TEV) or (TXV)

The Thermostatic Expansion Valve (TEV) used to be the most common. The Electronic Expansion Valve (EEV) is replacing it in modern systems.

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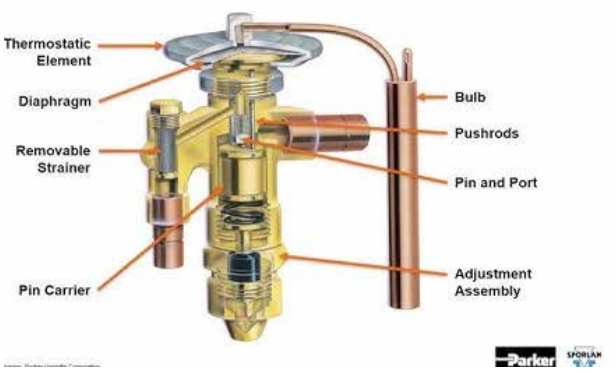
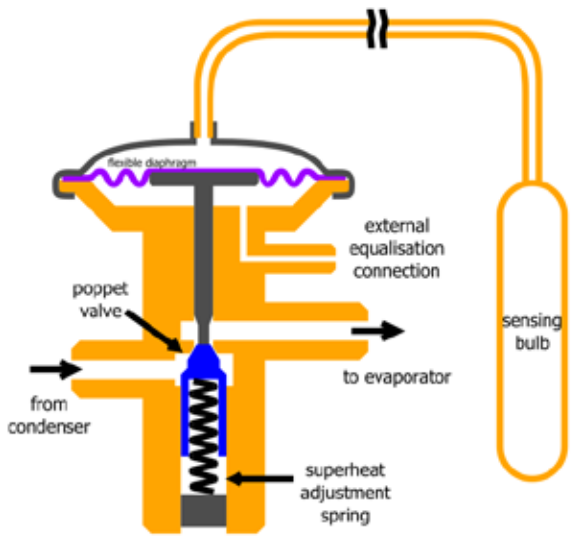
Several types of 'Danfoss' Thermostatic Expansion Valve Units. Note the Capillary Tube (coiled in the picture) and the sensing bulb at the end of the capillary.



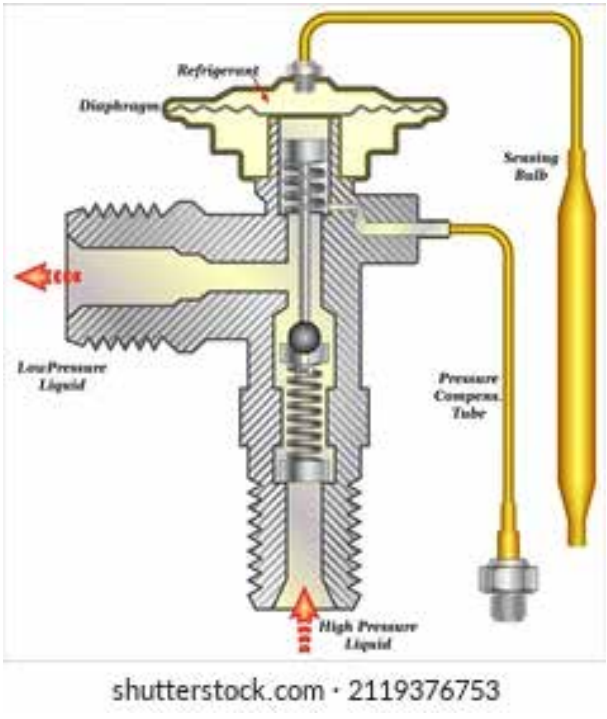
Parts of a Thermostatic Expansion Valve



Basics of a Thermostatic Expansion Valve

Basic construction of a TEV.

- The flexible diaphragm actuates the poppet valve; an increasing pressure in the sensing bulb will press down on the poppet and open the valve further.
- The pressure in the sensing bulb increases if the particular room temperature is high, making the poppet valve open more, to allow more liquid to flow, which turns into gas because of the expansion. More coolant reached the room's evaporator coil.
- Vice versa if the particular rom temperature is nearing its set point.
- There is also an adjustable spring providing a closing force on the valve which controls the superheat.



An Expansion Valve with different orifices

- Complex calculations have gone into deciding the size of the plant, the size of the compressor and ancillary parts, the size of the various rooms, the size of the evaporator coils, the size and type of the thermostatic expansion valve and various other parts, which is better left to the designers.
- What is important is the change of state of the refrigerant that takes place in the Thermostatic Expansion Valve. This change of state sets the tone for every and all changes that take place in the entire system. All the various temperatures are maintainable because of the precise working of the Expansion Valve.
- The Thermostatic Expansion Valve is a remarkable piece of engineering, as it involves several disciplines in a very small space. Several principles are involved in changing the state of the refrigerant.
- Everybody knows that water is a liquid at room temperature. It turns into steam or 'boils off' (gaseous state) at 100 deg C
- But refrigerants, which remain as a liquid at room temperature do the reverse. They 'boil off' or turn into a gaseous state at temperatures below -20 deg C or much below. For example, R134a (refrigerant) is a liquid at room temperature and 'boils off' or turns into a gaseous state at -26 deg C.
- This property of the refrigerant that reduces the surrounding temperature is what is used in refrigeration cycles.

Change of State of Refrigerant while passing through the Expansion Valve:

A. The Refrigerant reaches the Expansion Valve as a liquid at room temperature and a high pressure.

B. Changes state from liquid to partial gas and liquid while passing through the orifice - or port - of the Expansion Valve.

C. Pressure drops quite a bit.

D. The temperature drops dramatically.

E. The velocity of the refrigerant increases as it has passed through a port (an orifice). This velocity is important in ensuring that the refrigerant gas passes through the system and has enough energy left to reach the compressor suction.

Otherwise, the gas will accumulate in the Evaporator Coil and will not flow back to the compressor suction.

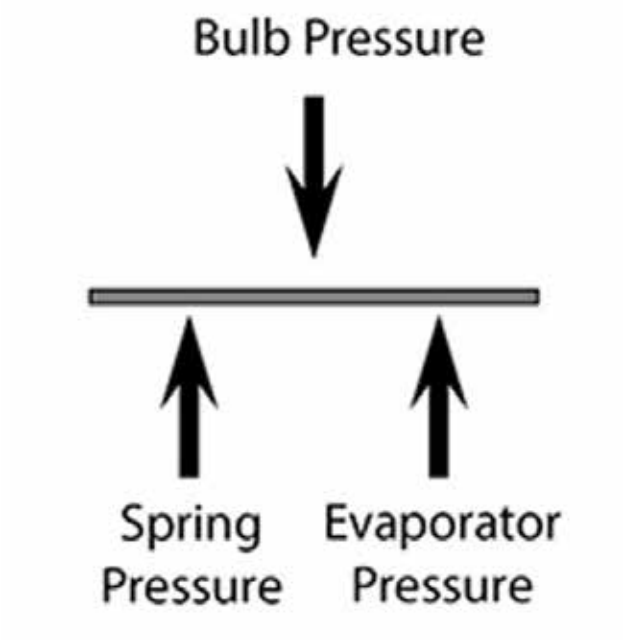
F. It can be seen that, at low sea water temperatures, the discharge pressure of the compressor comes down quite a bit if the condenser sea water valves are open fully. Under these circumstances, the change / drop in pressure in the Expansion Valve is less and the gas does not have sufficient velocity to pass the evaporator coils and reach the suction of the compressor. At that time, it is necessary to throttle the outlet SW valve to increase pressure of the refrigerant - thereby, consequently, the velocity - in the system.

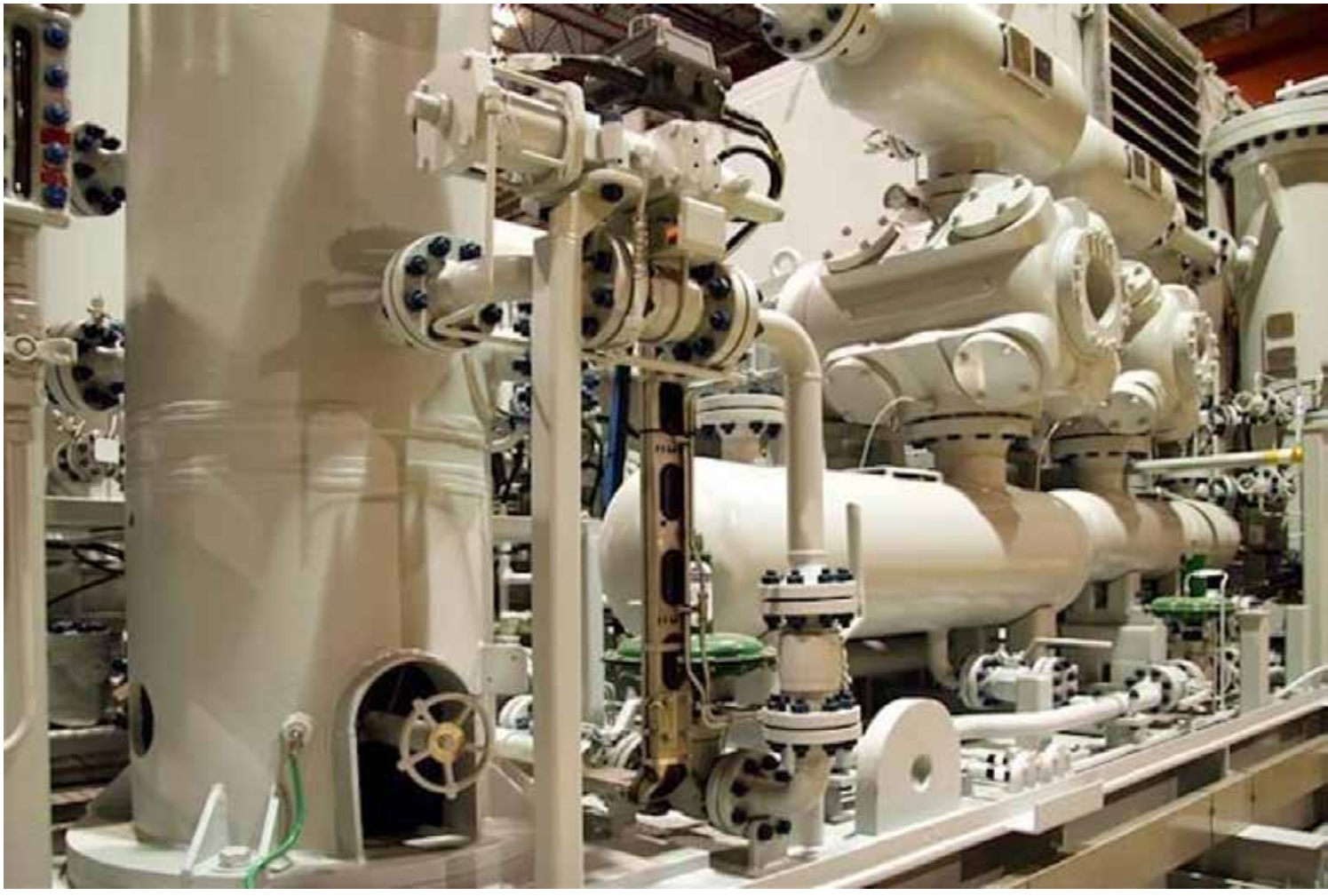
G. Since the Expansion Valve is the most critical part of a refrigerating plant, its working should be known intimately, so that faults can be diagnosed and rectified.

H. There are three different forces at work in a TXV: Bulb pressure, Spring pressure, and Evaporator pressure (see Figure below).

Bulb pressure comes from the bulb that is mounted at the outlet of the evaporator; the bulb senses the suction temperature and drives the diaphragm down if there is an increase.

Spring pressure is constant and pushes up against the diaphragm, counter to the bulb pressure. The





spring pressure is calibrated when the valve is set by the equipment manufacturer or the installer.

Evaporator pressure pushes the diaphragm up when the suction pressure increases and comes from the evaporator load on the system, which varies according to different operating conditions, such as room temperature changes.

Based on the balance between these three pressures, the valve will either open or close. (From Danfoss website).

I. The positioning of the sensing bulb, the gentle handling of this bulb and the capillary tube that leads back to the Expansion Valve, make for efficiency in the system. Wrong placement of the sensor bulb will give a wrong signal to the Expansion Valve, due to which desired room temperatures will not be achievable. This bulb should be located on the outlet side of the Evaporator.

Although this pipe is lagged, as almost all other pipes of the system are, there should be no accumulation of ice on the pipes. Slight frosting is okay, not a thick layer of ice. This thick layer of ice will insulate the bulb and make the sensor bulb reach the wrong input decisions, which will affect the precise working of the Expansion Valve.

If there is ice on the pipes, put off the room for a few hours and let all the ice melt. Wipe off the droplets of water and resume cooling.

J. If the system has got oil and dirt circulating, the dirt can clog the filter of the Expansion valve. (Some Expansion valves - old type - have ceramic or sintered filters). The filter is removable and can be cleaned or exchanged.

K. It is advisable not to adjust the factory settings of the Expansion Valve. You can run into a series of problems.

L. Do not pour hot water on the Expansion valve if iced up. Pouring hot water will, likely, damage the fluid in the capillary tube of the sensing bulb. Instead, allow it to melt by itself and try to find the cause of why ice has accumulated.

7. Evaporator Coil and Fan:

Note the gas distributor (to each set of coils) on the right. This is one of the choke points - elaborated in the text. Note the copper tubes passing through the aluminium fins.

Problems that one comes across on Evaporators:

A. Faulty fan.

B. Faulty timer (cycle) of heating coil for defrosting (de-icing) the evaporator. This allows ice to build up in the fins of the evaporator which, then, will impede the flow of air from the room into the evaporator.

C. Heavy build up of ice takes place on the evaporator due to excessive moisture in the room. This usually happens if the room doors have been kept open for long periods: example, during bringing in supplies.

The cooling for the room should be shut off during the period of loading supplies.

After the loading of supplies into that room, the moisture in the air is likely to choke the coils of the Evaporator. This can be, usually, prevented by manually initiating an extra de-frosting cycle after the supplies have been brought in. The other option is to shut off the room cycle and allow the room

temperature to go up, whereby the ice can melt. Then, after drying the water droplets in the room, the refrigeration cycle can be re-started.

D. If the room temperatures are constantly giving trouble, it may be that the gas is not passing through and had choked the evaporator coils at the 'distributor' as shown above in the photograph.

This can be caused by two anomalies.

Oil has been allowed to come in along with the gas - due to an ineffective Oil Separator or, alternatively, too much oil charged into the crankcase - and this oil has carried with it some debris and dirt in the line. After this reached the 'U' turns found in the cooling coils - mainly at the 'distributor' - the oil coagulates and freezes to form a solid block. This chokes the flow of gas.

The same problem of blockage at the same point can be caused by moisture in the refrigerant. This moisture will turn into ice in the tubes and choke the tubes at the 'U' turn of the copper tubes.

The only way to get rid of this is to heat the copper tubes at the bends. Use a small flame, such as in a 'Bunsen' burner. This will carry the oil or moisture to the compressor and needs to be got rid of, by either cleaning the oil separator or changing the drier several times.

If this happens and the Chief Engineer is unable to even diagnose the fault, this particular type of problem induces the Chief Engineer to requisition a brand new Evaporator, when all it requires is local heating with a blow lamp at the 'U' bends of the Distributor. When heated, one can hear the clearing of the line and the sound of the liquid passing, indicating the passage is clear.

Finding choke points along the line can be difficult, but not that difficult if one observes the system closely.

Maintenance of the particular room's drain is important. The drain should not be choked by debris. Adding a little water into the drain maintains the efficacy of the 'S' Trap on the drain line.

8. ***Fault Finding in the System:***

A. Most of the faults and their solutions can be found in the seven sections described above.

B. As long as the operator can, consciously, prevent oil from flowing through the system, can contain the moisture accumulated and keep away ingress of air, the system will run itself.

C. As long as wet or moist air is not allowed to enter the cold rooms, icing of the evaporator coils will not take place and the room temperatures will maintain themselves.

D. The faults that are occurring or about to occur in the system, will show up clearly as a heavy iced up

section. It means there is a choke in the line before the iced section.

E. If the system is normal, the compressor will cut in, run for a while and cut out on a regular basis.

F. There is a fault if the compressor cuts in and cuts out too often, which means not enough gas is reaching the compressor in a continuous flow. Most likely accumulated in one of room's evaporator coils. Or the system pressure is low due to low sea water temperature.

G. There is a fault if the compressor runs continuously. It means the rooms are not getting cooled, but the gas is flowing through the system. Most likely the fins of the evaporator coils are iced up. Shine a torch from one side and check for the passage of light from the other side.

H. I woud not recommend a 'Hot Gas Defrost', as the compressor will get hot running for long periods.

I. Most of the time, if a problem occurs in a 'Fridge Plant, arbitrary decisions are made - mostly to do with charging extra gas into the system - that may not have anything to do with the problem. A little bit of time needs to be taken to study and observe the whole plant before resorting to any work on the plant.

About the Author

Mr. A. Ranganathan, 1970 batch of DMET, now retired worked in Sisco and Barber SM. Of the 38 years at sea, 28 where as Chief Engineer, served on Car Carriers, Container Vessels, Bulk Carriers, MPCs and Self Unloaders. After leaving sea, he has been a Consultant and Vessel Manager with Maersk USA for 6 years.

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Obituary

Subrata Mukherjee (F 1289)

Shri Subrata Mukherjee, was born on 15th March 1945, and did his schooling in Hare School, Calcutta. He then trained at DMET from 1963, passing out in 1967.

He served with India Steamship Co. Ltd. and other companies at sea for a long time, rising to be Chief Engineer, with Steam & Motor certification.

Shri Mukherjee also worked ashore with TATA Steel, Jamshedpur, as a Manager. He served for a long period as Faculty with ITME Kolkata, B.R. Ambedkar College, Port Blair, and DMET / MERI / IMU Kolkata.

He was very actively associated with The Institute of Marine Engineers, Kolkata Branch, where he regularly presented interesting technical papers, many arising out of his own academic research.

This well-loved marine engineer passed away on 7th November 2024 in hospital, while under treatment for heart disease.

May his soul rest in eternal peace.

A.K. Verma (F 1271)

On behalf of The Institute of Marine Engineers (India), Mumbai Branch, including the Navi Mumbai and Gujarat Chapters, deeply mourn the passing of Mr. A.K. Verma on 28th December 2024.

Mr. Verma, a distinguished and senior member, served as the first Chairman of the Gujarat Chapter, leaving an enduring legacy.

Our heartfelt condolences to his family. May his soul rest in peace and may strength and comfort be granted to his loved ones.

The Institute of Marine Engineers (India)

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