



Sagar Sandesh

Guiding Spirit to Shipping Industry

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CMMI monthly lecture on- NEW LNG VESSEL DESIGN & CONTAINMENT- by Capt Tapan Kumar Panda & Propulsion Overview by Mr Satish Singh

The Company of Master Mariners of India (CMMI) conducted a monthly lecture meeting on **NEW LNG VESSEL DESIGN & CONTAINMENT**. The meeting was conducted in hybrid mode on **20th April 2023** at MOL Mumbai Office Conference Hall. The Keynote Speaker was **Capt. Tapan Kumar Panda** – Manager Training, MOL Maritime (India) Pvt. Ltd. Member CMMI and Extra Masters.



Capt. Tapan Kumar Panda, Manager Training MOL India



Mr. Satish Singh MD MOL India

Thereafter **Mr. Satish Singh, Managing Director MOL Maritime (India) Pvt. Ltd,** Chief Engineer with 30 years of experience in the Maritime industry addressed the topic on **LNG PROPULSION OVERVIEW**.

Capt. Sasi Kumar, CEO CMMI welcomed the participants and introduced the Speakers.

Capt. Tapan Kumar Panda gave a detailed presentation, important highlights he addressed were:

There are a total of about **672 active LNG vessel** trading now, and **323 LNGCs** are on order as of Feb 2023. During 2022 – More than 3 new LNG vessel is ordered weekly – In absolute number terms it is unprecedented. 42 LNG vessels are expected to be delivered in 2023 and 81 during 2024 and 90 in 2025 (all-time high) and 49 new LNG vessels to be delivered in 2026. The cost of the LNG Vessel is now at about 250-260 million US \$ which is close to a little more than 2000 crore Rupees. Manning Market will intensify by 2024 for handling so many new deliveries with emerging technology.

The future of global energy is dominated by four trends: a declining role for hydrocarbons, rapid expansion in renewables, increasing electrification, and growing use of low-carbon hydrogen. You may see a major trend in energy till 2050. LNG being a FOSSIL fuel tag will come under pressure, but it is a **TRANSITION** fuel from FOSSIL to RENEWABLE. Further certain technological change for lowering the impact of LNG mission is surfacing.

Generally LNG vessels have 2 types of Containments

1. Self Supporting

(SPHERICAL- STANDARD MOSS, STRETCHED MOSS & PRISMATIC- SPB – SELF SUPPORTING PRISMATIC TYPES)

2. Membrane (Technigaz Mark III, Gaz Transport NO 96 both are GTT Tanks)

MEMBRANE TYPE LNG, Predominantly of 2 types

1. Membrane NO 96 (36% of total fleet at present and 72% of total order book)
2. Membrane Mark III (40% of total fleet at present and 21% of total order book)

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CMMI monthly lecture on- NEW LNG VESSEL DESIGN & CONTAINMENT....From Page : 1

GAZ Transport no 96 - The concept

The primary and secondary membranes are made of Invar®, a 36% nickel-steel alloy, 0.7mm thick. The primary membrane contains the LNG cargo, while the secondary membrane, identical to the primary, ensures a 100% redundancy in case of leakage. Each of the 500mm wide Invar® strakes is continuously spread along the tank walls and is evenly supported by the primary and the secondary insulation layers.

NO96 evolutions: improving the thermomechanical efficiency of the system:

GTT's technologies are continually being optimized to meet the requirements of ship-owners and shipyards, while also complying with regulatory changes affecting the sector.

The perlite has been replaced by foam in NO96 L03 or by glass wool in NO96 GW evolution.

A set of reinforced boxes have also been developed in order to meet requirements for systems sustaining higher loads.

TECHNIGAZ MARK III CONCEPT

Technigaz Mark III technology is a cryogenic liner used to contain liquefied gas at low temperatures during shipping, onshore and offshore storage, at atmospheric pressure. This technology and its evolutions equip more than 200 vessels in operation and under construction and benefit from more than 50 years experience at sea.

The concept

The Mark III membrane system is a containment and insulation system, directly supported by the ship's hull structure. It is composed of a primary corrugated stainless steel membrane, positioned on top of prefabricated insulation panels, including a complete secondary membrane made of composite material.

This modular system employs standard prefabricated components that can accommodate any shape and capacity of tanks. They are designed for mass production techniques and easy assembly.

Mark III concept

Stainless steel primary membrane

Mark III evolution

GTT technologies are continually optimized to meet the requirements of ship owners and shipyards, while also complying with regulatory changes affecting the sector.

Since 2008, GTT has introduced Mark III design evolutions to improve the thermal and structural efficiency of the technology.

Its latest development, **Mark III Flex+**, offers a guaranteed boil-off rate of 0.07% V/day, thanks to an insulation thickness increase of 480 mm.



NEW SPB SHIP

Thereafter **Mr. Satish Singh** took the topic of **LNG PROPULSION OVERVIEW** and gave a detailed presentation, the important highlights were:

Propulsion Types:

1. SST (SUPERHEATED STEAM TURBINE)
2. DFDE/TFDE (DUEL FUEL/ TRI-FUEL MEDIUM SPEED ENGINE WITH ELECTRIC PROPULSION)
3. SSSR (DRL) (SLOW SPEED DIESEL WITH RELIQ. PLANT)
4. DFD (HIGH-PRESSURE GAS INJECTION SLOW SPEED DIESEL-MEGI)

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5. DFD-XDF (LOW-PRESSURE SLOW SPEED DIESEL ENGINE), XDF 2.0 , ME-GA
 6. GTE (GAS TURBINE ELECTRIC)
 7. UST (ULTRA STEAM TURBINE)
 8. USCT (ULTRA SUPER-CRITICAL TURBINE)
 9. SAYARINGO STaGE (UST + DFDE)
 10. OTHER HYBRID OPTION (UST+ GTE etc).

He Briefed on EACH Type of above mentioned Propulsion Engines, highlighting Nox, Sox, Co2; Profile of engines w.r.t. IMO Tier, ENVIRONMENTAL PROFILE OF VARIOUS ENGINES, SST, UST & USCT ENGINES DETAILS, GHG EMISSION of various engines and finally the **FREIGHT RATES of 2 stroke engines which are earning much higher rates compared to Steam and TFDE Ships** and ended the topic with remark- "Trending Now is **WinGD X-DF vs MAN B&W ME-GA**".



Capt. Sasi Kumar, CEO CMMI

The meeting ended with a Vote of Thanks from **Capt. Sasi Kumar, CEO CMMI.**

Naval Chief in Singapore on an Official visit

SINGAPORE
Sagar Sandesh News BUREAU

Admiral R Hari Kumar, Chief of the Naval Staff, Indian Navy is currently on an official visit to Singapore from May 02 to 04.

During the visit the CNS co-officiated the inaugural ceremony of maiden ASEAN – India Maritime Exercise (AIME) 2023, held at Changi Naval Base, Singapore on May 02.

The ceremony was jointly inaugurated by Adm R Hari Kumar and RAdm Sean Wat, Chief of Navy, Republic of Singapore Navy in the presence of



Admiral R Hari Kumar, Chief of the Naval Staff, Indian Navy in Singapore

senior dignitaries from other ASEAN nations. **This inaugural edition of AIME is being co-hosted by the Republic of Singapore**

Navy and Indian Navy and will witness participation of ships and personnel from other ASEAN countries.

The harbor phase of the exercise is scheduled to

MARINE NEWS

be held at Changi Naval Base from May 02 – 04 and the Sea Phase will be conducted from 07 to 08 May 2023 in the South China Sea.

The CNS would also be calling on Minister for Defense, Singapore and would be interacting with the Chief of Defense Force (CDF), Singapore Armed Forces (SAF), Chief of Navy, Republic of Singapore Navy (RSN), other Navy Chiefs and Heads of Delegation from countries participating in the AIME, IMDEX and IMSC. CNS would be having an engagement with Academia in Singapore to discuss **ASEAN – India Maritime Connect Opportunities.**

The AIME-23 is aimed at promoting Maritime cooperation and enhancing trust, friendship and confidence amongst ASEAN and Indian Navies.

India's first indigenously-built destroyer, INS Delhi and INS Satpura, an indigenously-built guided missile stealth frigate along with a P8I Maritime Patrol aircraft will participate in the Inaugural ASEAN India Maritime Exercise and IMDEX. The participating ships form a part of Indian Navy's Eastern Fleet based at Visakhapatnam and operate under the command of RAdm Gurcharan Singh, the Flag Officer Commanding Eastern Fleet.



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VISAKHAPATNAM
Sagar Sandesh News BUREAU

The two year old project to put up a floating restaurant out of a ship that ran aground near the Visakhapatnam beach has at last taken off

The work on the restaurant in Bangladeshi ship M V Maa that ran aground amidst rough weather has gained momentum as the survey of the vessel has been completed

A Private firm has come forward to develop the ship as a floating restaurant through an Special Purpose Vehicle exclusively created for the purpose. The plan to lay a pathway from Jodugullapalem to Tenneti Park Beach had hit a roadblock as a forest clearance was required.

Regional Director of Tourism Srinivas Pani said for the forest clearance, a DGPS survey was necessary and also equivalent land

Abandoned ship to host a restaurant in Visakhapatnam, awaiting forest clearance



had to be alienated for the forest department. The district Administration has created conditions to facilitate the survey of the vessel.

Forest clearance and remote sensing maps are expected within a week, while the Coastal Regulation Zone clearance will be given within two months, according to media reports.