www.sagarsandesh.in Pages 14

Sagar Sandesh

Guiding Spirit to Shipping Industry

Maritime Tabloid English Weekly Thrice E - Paper

In association with R L Institute of Nautical Sciences, Madurai, Tamil Nadu. | RNI No. TNENG/2012/41759 | Friday , June 03, 2022 | Voyage 11 Wave 48

Published & Released on Every Monday , Wednesday and Friday

PAGE - 4
ONE announces signing of Ship Building Contracts for.....

PAGE - 5
Shipping companies added capacity, but now .....

PAGE - 9
Jindal Steel and Power Limited consortium wins contract.....

PAGE - 12
After India, Lanka turns to China for assistance

CMMI address on "India's Hydrogen policy & Hydrogen as a marine fuel"

By Dr. DC Patra, Ph.D

The Company of Master Mariners of India (CMMI) conducted the monthly lecture on 20th May 2022 on hybrid mode at Mumbai Maritime Training Institute (MMTI). Capt. Sasikumar, CEO of CMMI welcomed the speaker Dr. DC Patra and all the participantspresent physically as well On-Line zoom platform.

After the brief introduction of **Dr. D. C. Patra, Ph.D., Fellow Energy Institute London, Former Executive Director, Bharat Petroleum Corporation Ltd.,** Dr. Patra addressed the topic through his exemplary presentation, detailed as under:

Dr DC Patra

Introduction

Shipping is a major channel of global trade and about 95% of world trade is carried by ships. Shipping Industry is getting itself ready for contributing to clean air and sustainable business by engaging in the UN's mission of keeping the global temperature within 1.5 deg Celsius. Maritime shipping was estimated to contribute 2.89% of global greenhouse gas emissions in 2018. The shipping industry is at the start of a radical technology change and energy transition. The fossil fuels that has been powering the ships need to be substituted with new energy sources, supply chains for the production of those energy carriers, propulsion technologies, ship engine, and storage.

Drive for Global Decarbonization

Following the adoption of the Paris Agreement and the stark warnings for temperature alignment coming from the Intergovernmental Panel on Climate Change, which implies the need for rapid decarbonization, the shipping industry is under increasing pressure to cut its carbon emissions. With such an aim in mind, in 2018 the IMO adopted an initial strategy to cut greenhouse gas emissions from international shipping by at least 50% by 2050 compared with the 2008 levels. This target applies only to international shipping's operational emissions and does not include upstream emissions.

The Norwegian Parliament in 2018 enacted a resolution to protect the country's world heritage fjords. This resolution would halt all emissions from cruise ships and ferries in the fjords by 2026.The State of Alaska's Visible Emission Standards limits the emission of all marine vessels within three miles of their coastline.The European Maritime Safety Organization plans to cut the EU's carbon dioxide emissions from maritime transport by at least 40% (50% desirable, from 2005 levels) by 2050.

In a meeting of the Maritime Safety Committee of IMO, held in April 2022, the Carriage of Cargoes and Container (CCC) Sub-Committee was instructed to commence the development of guidelines for the safety of ships using ammonia as fuel, with a target completion year of 2023; and to revise the interim recommendations for the carriage of liquefied hydrogen in bulk, with a target completion year of 2024. The use of alternative fuels plays an important role in ensuring the IMO successfully implements the initial GHG strategy. The revision of the GHG Strategy is currently under consideration by the Marine Environment Protection Committee (MEPC) of IMO.

Turn to page -2 >>

CMMI address on "India's Hydrogen..... From Page : 1

Memento presented to Dr. Patra by Capt. Dubey MMTI

Clean Fuel Choice

It is estimated that the global average take-up of scalable zero-emission fuels (SZEFs) needs to be 5%, 60%, and 100%, by 2030, 2040, and 2050, respectively, as a share of shipping's energy demand, but developed economies, as early adopters, will need to take much higher share, up to 30% in the same timescale.

The cornerstone of decarbonizationin the shipping industry lies in fuel choice, which determines emissions onboard ships as well as those associated with fuel production. **In the transport sector, which is responsible for 35% of all emissions globally, hydrogen and ammonia have the potential to play a transformative role in the route to decarbonization.** Both fuels boast versatility for use in fuel cells and internal combustion engines, making them an attractive option for the hard-to-abate transport sector. Battery technologies are enabling the electrification of road transportation with relative ease and will dominate that sector, but for heavy-duty vehicles, particularly trucks, ships, and commercial planes, hydrogen, and ammonia have the potential to be competitive energy sources. Large-scale hydrogen and ammonia marine engines are expected to be commercially available by the mid-2020s, while large-scale fuel cell arrangements will be ready by the 2030s. As of March 2021, the Global Maritime Forum examined 106 projects looking at zero-emission fuels in the maritime sector, of which nearly three-quarters were focusing on hydrogen or ammonia.

Investment in Technology & Eco System

The long design life expectancy of ships (around 25–30 years) and consequent long-term financial implications mean that decarbonization will not be rapid. But the ability to convert a ship to operate zero-carbon fuels will play a pivotal role in the transition to 2050 and decisions made for new builds today will have long-lasting consequences. Hence, ship owners will have to make critical investment decisions to carefully balance their finances and ensure their assets do not become stranded. The modern 2-stroke engine can burn almost anything. With modifications to the injection and fuelling supply systems and the addition of extra fuel tanks, a ship can be transitioned relatively easily to a dual fuel engine operating on a conventional fuel along with a zero-carbon fuel.

The transition to zero-emission fuel entails a change in the ecosystem of fuel production, storage, and supply chain. It also

Turn to page -3 >>

CMMI address on "India's Hydrogen..... From Page : 2

involves investment decisions in infrastructure, capital, and operating expenditure management of the ship. With typical commercial ships taking around three years to build, hydrogen-powered engines will likely be seen by the late 2020s and early 2030s for new-build ships. Retrofit hydrogen and ammonia engines could potentially surface before this, but that will depend on the development of storage and fuel supply systems. Maritime risk-management expert DNV is establishing guidelines for the safe handling of hydrogen and ammonia as a shipping fuel.

Hydrogen – A Zero-Emission Fuel

Hydrogen is most efficiently utilized in fuel cells (efficiency typically 50-60 %, potentially higher for certain types with waste heat recovery), but it is also possible to apply it in adapted combustion engines (efficiency typically 40-50%). Some initiatives consider blending hydrogen with other fuels to improve combustion and emission properties, as well as potentially reducing greenhouse gas emissions. Finding volume-efficient ways to store hydrogen is challenging. Most commonly, it is stored either as compressed gaseous hydrogen or cryogenic liquid hydrogen. Hydrogen molecules are small and can diffuse through many materials including metals. This is mainly an issue for compressed hydrogen (which is typically 250-700 bar) where the molecules are "pushed" into the storage material. There are two safety concerns with this behavior; metal embrittlement (and eventually fracture) and gas "leakage". Material selection is therefore key to ensuring the safety and integrity of the fuel tank and fuel supply system. Storage and bunkering of hydrogen for use on ships will however require speciallydesigned storage tanks and bunkering systems, and there is currently limited experience with marine storage and use of hydrogen. Storage technologies are available from land-based applications.

The main advantage of hydrogen is the possibility of being a zero-emissions fuel if produced from renewables. Future hydrogen production capacity fits well with the anticipated energy transition to renewable power production on land. The most prominent challenges for hydrogen are the costs and the lack of bunkering infrastructure. Hydrogen will mainly be produced from natural gas without carbon capture and storage, as is the case today until the transition to renewable power production is well underway. However maritime projects opting for hydrogen may ensure the use and contribute to increased production of hydrogen produced from renewables, at the expense of higher cost and likely slower uptake. Another key challenge for hydrogen is its applicability. This limits the ship segments for which hydrogen can be used significantly. With current technology, hydrogen seems limited to short sea shipping when considering the current costs of tanks and fuel cells and range limitations due to its low density. The extent of safety mitigating measures and the cost of these will first be clear once rules have been developed for the use of hydrogen as fuel.

Economics of Green Hydrogen

For the overall production cost of green hydrogen, currently at US$ 5.5/kgH2, to reach parity with the cost of producing grey hydrogen (produced from gas) at US$ 2/kgH2 input costs must reduce further. In countries with greater renewable energy resources (more solar irradiance), the cost of production for green hydrogen is below US$ 3/kgH2. In Qatar and Australia, it is US$ 2.62 and US$ 2.61 respectively, materially lower than that of blue hydrogen, i.e., grey hydrogen with a carbon capture utilization and storage component, at US$ 4.61-4.80. It should also be noted that costs for required safety systems and mitigating measures (considering the flammability of hydrogen) are not quantified explicitly in the literature and may represent additional costs.

Green hydrogen is highly dependent on the cost of renewable electricity and is generally more expensive because of the capital cost of electrolyzers, which remain high due to their immaturity at a commercial scale. Therefore the cost of green hydrogen (USD 2.50–6.00/kg) is comparatively high. However, when coupled with the declining price of renewable electricity and the development of cheaper and larger electrolyzers, green hydrogen is expected to see substantial cost reductions and could fall more than 50% by 2050.

Hydrogen Fuel Cell

For marine vessels, fuel cells are the only viable, true zero-emission option. Just like batteries, fuel cells produce electricity with high efficiency through an electro-chemical process. The difference is, that with a fuel cell, energy is stored separately in the form of hydrogen fuel. As long as fuel is available, the fuel cell power systems will produce electricity as a generator. The only emissions from a fuel cell are water vapor and heat. Additionally, hydrogen fuel can be produced from renewable sources, including solar, wind, hydroelectric, and geothermal energy. And the cost of renewable hydrogen is expected to fall every year, especially as large-scale production projects are starting to emerge in Europe, Australia, and Chile.

Renewable hydrogen, generated from solar, wind, hydroelectric, and geothermal sources is considered ideal fuel for decarbonizing society. It can be used for industrial purposes, power generation, heating, and as a transportation fuel. However, for widespread marine use, the production of renewable hydrogen requires scaling up to meet the energy demand of ships. While the supply and fueling infrastructure is developing, the initial use of fuel cells in the marine economy will be for lower power applications, since such lower power applications will require lower quantities of fuel. These applications include propulsion of smaller vessels, powering auxiliary loads on larger vessels, or shore power applications. On cruise vessels, initial fuel cell applications could include the generation of auxiliary power for hotel loads, emergency systems, and a portion of the propulsion power. Eventually, to achieve the desired phase-out of greenhouse gas in this century, fuel cells will likely power the complete ship.

The acceleration of scaling up and subsequent cost reductions of green hydrogen have been taken up by seven of the world's largest hydrogen producers. They have united to drive a 50-fold scale-up by 2026, with the aim of reducing green hydrogen costs to half their current cost, to below USD 2/kg. This initiative, along with other large-scale developments across the globe, is key to achieving the complete phase-out of fossil fuels in the international maritime industry by 2050. The target was announced after the Biden administration in the US announced that it will lead and work with the IMO, to "ensure that the shipping industry emits

Turn to page -4 >>

Sagar Sandesh
Guiding Spirit to Shipping Industry
Maritime Tabloid English Weekly Thrice E - Paper

Mumbai Office
217, Secands Road, Unique Industrial Estate, off Veer Savarkar Marg,
Bombay Dyeing Compound, Prabhadevi, Mumbai - 400025
Ph: 022 - 24211583 / 24210193. Fax: 022 - 2421 2149
Chennai Office
No.6, Nungambakkam First Lane (Opp. Regional Office,Indian Oil Corporation), Nungambakkam High Road, Chennai - 600 034
Ph: 044-42664408
Admin. Office
21 "LAKSHMI", Sathya Sai Nagar, Madurai-625 003. Ph : 0452 437 8300 / +91 72000 84864

EDITOR & PUBLISHER : **Dr R Lakshmipathy**
EXECUTIVE EDITOR : **Dr G.R. Balakrishnan,** M.A Phd.,

SAGAR SANDESH - *Maritime Tabloid English Weekly Thrice E-Paper*
Published by Dr R Lakshmipathy (Owner) on behalf of
Professional Publications (P) Ltd, "Sriram", 27, Sathyasai Nagar, Madurai - 625 003.
Published at "Lakshmi", 21, Sathyasai Nagar, Madurai - 625 003, Tamilnadu.
RNI No. TNENG/2012/41759.

CMMI address on "India's Hydrogen..... From Page : 3

zero emissions by 2050"; a target which is far more ambitious than the current initial strategy outlined by the IMO. When assessing a variety of pathways to a 100% reduction in emissions by 2050, it is seen as critical for green fuels to make up 5% of the global fuel mix by 2030. Therefore, it is crucial for policies, initiatives, and regulations to adopt this target in order to increase renewable energy capacity and the uptake of green hydrogen-derived fuels in the shipping sector.

India Hydrogen Story

In India, carbon emissions of the maritime industry, excluding military operations, contribute to 1% of the overall transport sector emissions in India. As announced by the Union Minister of Ports, Shipping, and Waterways on April 30, 2022, Cochin Ship Yard Ltd (CSL) has planned to build a hydrogen fuel cell vessel, keeping pace with the Global Maritime Green Transitions. Technology is Low-Temperature Proton Exchange Membrane. The estimated cost is Rs. 17.50 crore of which 75 percent would be funded by the Government. CSL has partnered with KPIT Technologies Limited and Indian developers in the areas of Hydrogen Fuel cells, power trains, and the Indian Register of Shipping for developing rules and regulations for such vessels.

The Forum ended with a memento to Dr. Patra by Capt. Dubey and a vote of thanks by CEO CMMI Capt. Sasikumar followed by drinks and snacks, warm hospitality from the host Capt. C. L. Dubey, owner & Principal MMTI.

First Cargo Ship Leaves MariupolSince Russia Took the City

© den81 / Adobe Stock

NEW DELHI
Sagar Sandesh News Service

A ship has left the Ukrainian port of Mariupol for the first time since Russia took the city and is headed east to Russia with a load of metal, the Russian-backed separatist leader of the Ukrainian breakaway region of Donetsk said on Tuesday 31 May .

The shipment of metal to Russia from Mariupol amounted to looting Ukraine said

Ukraine said the shipment of metal to Russia from Mariupol, whose capture gave Moscow an overland bridge linking mainland Russia and pro-Russian separatist territory to annexed-Crimea, amounted to looting.

"Today 2,500 tons of hot-rolled sheets left the port of Mariupol," Denis Pushilin, the leader of the self-proclaimed Donetsk People's Republic, wrote on the Telegram messaging app. "The ship headed for (the Russian city of) Rostov."

Russia seized full control of Mariupol earlier this month when more than 2,400 Ukrainian fighters surrendered at the besieged Azovstal steelworks.

Russia said the port, demined and open again to commercial vessels

Russia said last week that the port had been demined and was open again to commercial vessels.

Crystal Cruises Ships up for Auction as the Parent Companies' Liquidation Continues

NEW DELHI
Sagar Sandesh News Service

The Ocean-going cruise vessels, CRYSTAL SYMPHONY and CRYSTAL SERENITY, are auctioned by the Supreme Court Commercial Division of Bahamas.

The auction is supposed to begin on June 7th with the winner being notified by June 14th and transfer of possession by June 21st.

The vessels were seized and have been under arrest in Freeport, the Bahamas, since February 5th after Genting Hong Kong defaulted on its debt.

CRYSTAL SERENITY by ship spotter steigi

Over 30,000 entities have filed claims

The cruise vessels are being auctioned off to reimburse the banks, fuel suppliers, travel agents, and even passengers that are creditors to the company. To put things in perspective, over 30,000 entities have filed claims with Florida authorities overseeing the liquidation of Genting Hong Kong. The auction is held with a sealed tender process where the bids are not disclosed until opening time. However, the banks can petition the court not to make the sale if they feel that the bids are too low, or they may bid for the vessels themselves if they do not find a good offer.

Experts are putting a trading value of $87.4 mn on 2003 built CRYSTAL SERENITY and $18.2 mn on 1995 built CRYSTAL SYMPHONY. The age of the vessels is the primary deterrent to buyers and is driving the prices down. However, the fact that many cruise vessels were dumped not so long ago in scrapyards by Cruise liners has also further reduced the value of cruise vessels in the market.

The scrap value of the vessels

Not discounting any possibility, the scrap value of the vessels is estimated to be $ 22.2 mn for the CRYSTAL SERENITY and $ 17 mn for the CRYSTAL SYMPHONY.

ONE announces signing of Ship Building Contracts for Ten Very Large Container Ships

ONE
OCEAN NETWORK EXPRESS

NEW DELHI
Sagar Sandesh News Service

Ocean Network Express Pte. Ltd. has signed ship building contracts with both Hyundai Heavy Industries Co. Ltd. and Nihon Shipyard Co., Ltd. to construct 5 vessels each, adding a total of ten modern Very Large Container Ships (VLCS) to ONE's fleet.

These ships to be delivered in 2025

These ships have a nominal capacity of more than 13,700TEU and are to be delivered in 2025. This investment embodies ONE's Midterm Strategy announced in March, to safeguard a sustainable supply chain for the future and underscore ONE's green strategy and decarbonization plan.

The vessels are designed with the highest efficiency standards as well as a variety of cutting-edge technology to reduce navigational impacts to the environment and are planned for the "Ready notation" or "AiP (Approval in Principle)" of Ammonia and Methanol as fuel, Carbon Capture and Storage.

ONE is determined to become a leader in maritime decarbonization

Moreover, this fleet will enable ONE to broaden the exploration of long-term alternative fuels and decarbonization technologies in the future.

ONE is determined to become a leader in maritime decarbonization and remains fully committed to achieving sustainable marine transportation by achieving carbon neutrality by 2050.

The company will continue to make necessary investments in greener assets and technologies, whilst engaging in open collaboration with industry stakeholders.