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TWENTY SECOND EDITION  
JULY 2022

# GEIMS CHRONICLE

**THE GREAT EASTERN INSTITUTE OF MARITIME STUDIES**

**A Division of The Great Eastern Shipping Company Limited**

[www.geinstitute.com](http://www.geinstitute.com)

Tel.: 95953-12126 , 7620312127 , 7304312135

On my honour, I promise to serve my country  
to the best of my ability at all times.

I shall be loyal to

**The Great Eastern Shipping Co. Ltd**

and will place the ship always before myself.

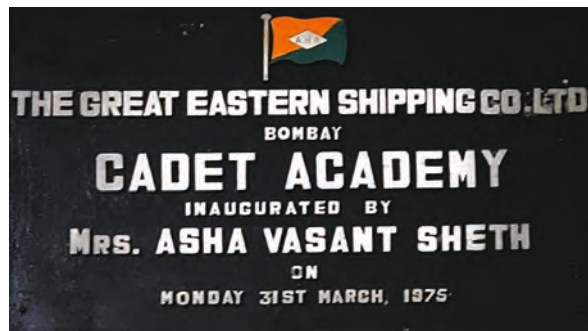
I will be proud of my uniform,  
as an officer

In the service of the company and  
will uphold the moral values  
based on my Indian Heritage.

**Jai Hind**



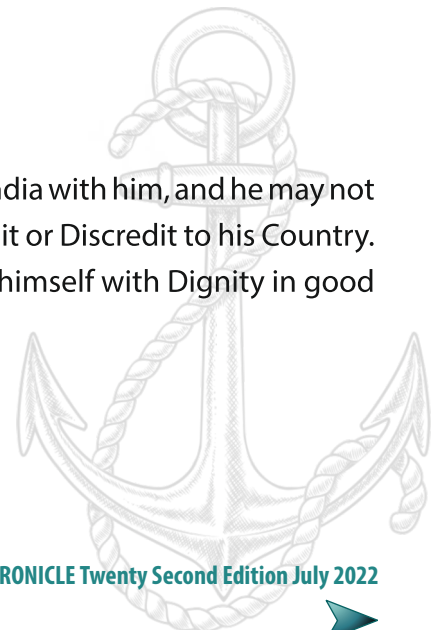
1975 - 2006



Estd. 2006

"Wherever in the wide world there goes an Indian, there also goes a bit of India with him, and he may not forget this or ignore it. He has it in his power to some extent to bring Credit or Discredit to his Country. Honour or Dishonour. Let him keep this in mind always and let him bear himself with Dignity in good fortune and ill fortune alike."

**- Pandit Jawaharlal Nehru**





# GEIMS CHRONICLE



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**Disclaimer :**

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**DEAR FRIENDS,**

It gives me great pleasure to write a few words in this issue of GEIMS Chronicle. This has a new team and it is entirely their brainchild I must congratulate them on all the efforts and time spent to conceptualize and eventually bring it to reality. I think it has come out pretty well but this is my view, we would look forward to your thoughts and opinions and also suggestions to further improve are most welcome.

I must thank Mr Sudhanshu Phalke, our senior engineering faculty as the Chief Editor ably supported by Ms Yasmin Pattan and Mr Amrinder Singh Minhas our cadets who enthusiastically volunteered to take up the mantle of making this periodical GEIMS newsletter. I am thankful to many others who have supported this cause and the esteemed people who have written articles for the magazine.

I have worked with The Great Eastern Shipping Company Ltd since December 2006 in various functions and superannuated in April 2021 as Vice President, Heading Training and Assessment Department. I am thankful to the management for having retained me as Advisor and subsequently in October 2021 asked to take over charge of this esteemed Institute The Great Eastern Institute of Maritime Studies (GEIMS).

It is now close to nine months since taking over but for a few months early this year there was very limited activity due to the recurrence of the Covid-19 pandemic and hence the Institute had to be closed down for physical classes for an extended period. Each time the challenges that come with closing down and then subsequent reopening were faced manfully by one and all and we managed to get GEIMS up and running to full speed seamlessly. I am thankful to all the staff for making this happen. I guess it is such challenges that makes life interesting and overcoming them makes life meaningful.

GEIMS has been awarded the Best Maritime Training Institute “Sagar Sanman” award which is presented by the NMDC (National Maritime Day Celebration Committee) on the 5th of April for two consecutive years 2021 and 2022 as also received the “Samudra Manthan” award from Bhandarkar Publications again for two years running. But this does not allow us to sit on our laurels as awards are mere recognition for things that we do right but also to encourage us to be consistent and do even better.

**Vision –**

The Management Vision is to make GEIMS the best MTI not only in India but comparable to the best in the entire Maritime Industry. My aim in this direction is to make improvements to the existing system. Considering various aspects, the vision for the institute came down to 6 major factors namely: General, Faculty, Trainees Selection and Placement, Infrastructure, Course Content, and finally Systems.

**Mission –**

There are plans for tie-ups with prestigious national and international academic/ maritime institutions for various programs. Taking inputs from the faculty for improvement in the functioning of the MTI. GESCO sailing staff stepping in as visiting faculty for various subjects.

We plan on making changes in the current trainee selection process, stronger filtering criteria, stricter selection panel, and question banks to be prepared to have uniformity in the level of assessment.

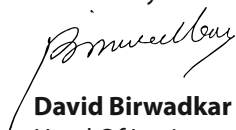
The alumni group of ex-cadets to be active participants in the recruitment process by encouraging students from their respective colleges to join GEIMS.

Aggressive use of social media and digital marketing for attracting better quality students. Encouraging inter-institute/ college competitions, better sports facilities. More frequent use of simulators.

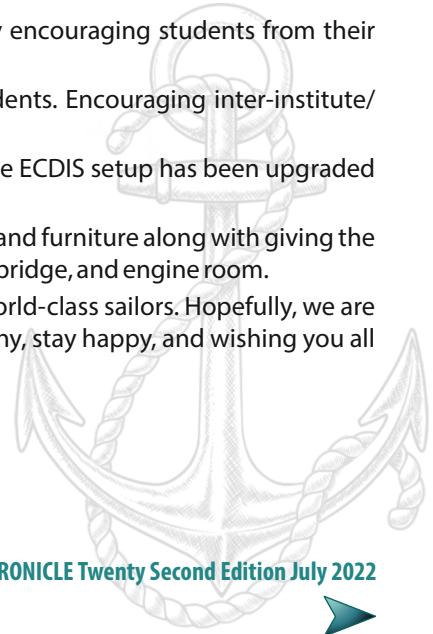
Within this year we plan on upgrading the library books and digital library database. The ECDIS setup has been upgraded with the latest regulatory requirements.

And mostly within the next 3 years, we plan on upgrading the student accommodations and furniture along with giving the cadets an actual feel of working in the workstations such as the pump room, navigational bridge, and engine room.

My main goal is to provide the best for the cadets to inspire and motivate them to be world-class sailors. Hopefully, we are moving in the right direction. More next time. Till then stay blessed, stay safe, stay healthy, stay happy, and wishing you all success in your endeavours.



**David Birwadkar**  
Head Of Institute, GEIMS



**DEAR SEAFARERS,**

The changing world of shipping .....

**Yara Birkeland** (120-teu, 3,200-dwt, built 2021) crew to move onshore one by one as autonomous trials begin..... the plan is to make the electric containership an unmanned vessel by 2024. The world's first electric autonomous container ship, the Yara Birkeland is owned by ammonia producer and LPG carrier owner Yara International. The ship will cut 1,000 tonnes of CO2 and replace 40,000 trips with diesel-powered trucks each year through battery power.

The vice president of sales and marketing at autonomous vessel company Massterly, said there is a crew on board now, but this will gradually change. The first step in its autonomy journey is to test the robotic mooring arm, "That should be able to replace the two people who do that job." After that, the chief engineer will move to shore, then the two navigators, one at a time, and eventually, all jobs will be moved onshore.

In other news, the Panama-flagged Prism Courage passed through the Panama Canal and crossed the Pacific Ocean to arrive at the Boryeong LNG Terminal in South Chungcheong Province, Korea. During the latter half of the journey, the ship was under the control of the autonomous navigation system, which not only steered it but sought out the optimal routes and best speeds based on artificial intelligence. This provided navigation as well as compensation for weather and wave heights and legally avoiding passing ships by steering in real-time, without anyone at the wheel and on a crowded lane with 100 other ships! The ship also achieved an increase in fuel efficiency of 7 per cent and a reduction of greenhouse gas emissions of 5 per cent. In addition, it was able to locate and avoid other ships over 100 times. During the voyage, Prism Courage was monitored by the concerned classification societies to confirm performance and stability.

The above two excerpts from the recent news highlight the new and fast-paced developments in shipping. The changing environment also brings up newer expectations from the present-day seafarers and from the administrators too. There is a need for a skilled workforce to cater to upcoming technology and this will be in greater demand in the coming years.

According to International Maritime Organisation's maritime autonomous surface ships (MASS) working group, there is a road map towards a 2025 completion date for mandatory regulations. There is the possibility of non-mandatory guidelines for MASS in the meantime. The training and certification will need a change such that the present-day seafarers getting ready for certification are geared up to face the challenges ahead. The industry is quite clearly changing fast and the seafarers need to stay ahead of the learning curve to stay relevant in this changing environment.

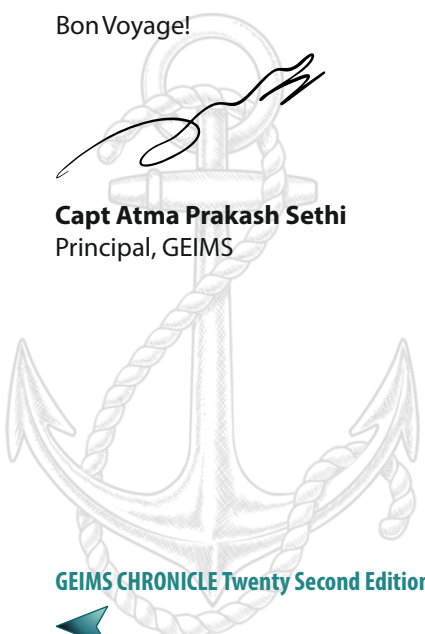
As the old saying goes, "When the change outside is faster than the change within, you are falling behind".

Thank you.

Bon Voyage!



**Capt Atma Prakash Sethi**  
Principal, GEIMS



**DEAR UNSUNG HEROES,**

Welcome to the **22nd edition** of the **GEIMS CHRONICLE**. This year we have a change of guard at the CHRONICLE, Capt Subroto Khan left us after 8 years to join TS Chanakya as Director. We wish him every success in his glorious career ahead. I thank Mr David Birwadkar, Head of the Institute for appointing me as the Editor. The Editorial Team and I shall strive to take the magazine to greater heights.

We are very well aware of the changes that have been taking place in the shipping industry since the pandemic hit the world most unexpectedly ever. It had a major impact on every industry; While the world took a mighty break and worked in the comfort of their homes, the sea trade persisted day in and day out. While the world spent much-needed quality time with their families, the seafarers continued duty-bound at sea. Seafarers proved to the world that they are truly The Unsung Heroes who continued to work throughout the pandemic despite all the restrictions imposed on them. It is high time the world all over acknowledged the extent to which seafarers' life is intertwined with their own.

Despite everything happening, the marine industry continues to develop rapidly. It is imperative to safeguard our environment, leading to measures being taken to meet the strategy set up by IMO with the vision to reduce greenhouse emissions from ships. The shipping sector produces 2-3% of global CO 2 emissions. The goal is to reduce the shipping industries' GHG emissions by at least 50% by 2050. Decarbonisation has indeed become a priority for not only the ship owners but also the governments, who are trying to meet the commitment to close the gap to NET ZERO emissions.

As per the press release of 25 May 2022, The Great Eastern Shipping Co. Ltd took a step towards this decarbonisation journey by supporting DG Shipping and the Indian Register of Shipping. They completed the first ever trial run in India on an MR tanker in international waters using a biofuel blend. Bio-fuel grade B20M, a blend of ISCC certified 20% FAME biofuel and 80% VLSFO is bunkered at the Dubai anchorage, UAE from a German company UNIPER Energy.

Speaking of bio-fuel, it is a fuel that is derived from renewable sources. In the case of the trial run, waste oils such as used cooking oil are used. Bio-fuels are considered to be carbon neutral because the carbon dioxide that is absorbed by the source of the biomass is equal to the carbon dioxide that is released when the fuel is burned. A positive step towards NET ZERO.

Kudos to Great Eastern Shipping Co for the installation of its first e-ORB on board 'Jag Viraat'. This is the first Indian flagship in the fleet to adopt the certified e- ORB. This is a milestone in the company's journey toward digitalization.

This year we have had a tremendous response for the magazine and got contributions from Cadets, Faculty, and external Industry Professionals like Mr Rajesh Doshi, IMEI Chairman (Guj Chapter) Bombay, and Mr Cawsi Lilauwala, Advisor, and Mr Kishore Bedekar, Independent Consultant. I thank every one of them.

This time we have given the magazine a new look. Hope everyone has an interesting read and we welcome your feedback for continual improvement.



**Sudhanshu Phalke**  
Engineering Faculty



## STABILITY BOOKLET AND INCLINING EXPERIMENT: THEIR CONNECTION - Asit Das

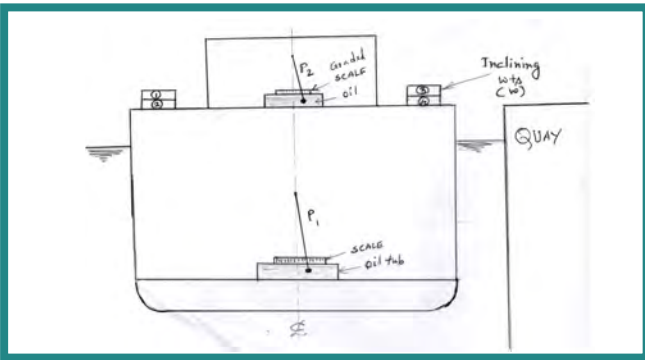
We all know that the inclining experiment is an essential part of ship design and ship construction. When the ship is constructed in all respects up to the lightship stage then it is taken inside a wet basin or a dry dock for the inclining experiment.

A Wet basin is like a harbour but smaller in size. Both are protected / sheltered water from the sea. An Inclining Experiment is essential for ensuring the stability of the ship. Due to some constraints, it may not be possible for the shipyard to conduct the Inclining Experiment, but without an approved stability booklet the ship cannot venture out to sea to undergo sea trials.

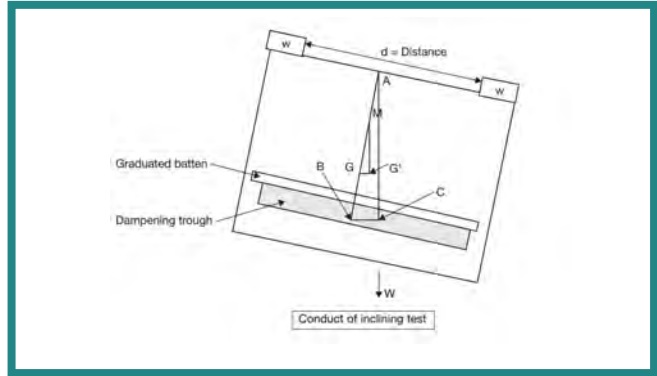
Hence a Preliminary Stability Booklet is prepared for this purpose from the KN curves which are known as cross curves of stability. Thus righting lever (GZ) curves are drawn for each loading condition of the ship and at different angles of the heel. Thereafter this preliminary stability booklet is sent for approval by the Classification Society. Once approved, the ship along with the pilot, shipyard Engineers, Ship surveyors, owner's representative, and crew can venture out to sea for the necessary trials.

Subsequently, sea trials are done viz. Speed trial, Turning circle radius trial, Anchor windlass trial (lowering and hauling up the anchor smoothly without fouling), Life Boat lowering and hauling up, Main engine endurance trial with all necessary pressure and temperature readings, Bow thruster (if any) trials, Rudder trials.

On successful completion of all such trials, all outfitting job is completed in afloat condition at the wet basin of the shipyard. After completion of the pending outfitting jobs, the ship reaches the stage for the Inclining experiment.



After completion of this experiment, the final Stability Booklet is prepared by the design office and Class approved. The approved stability booklet is carried on board throughout the entire lifetime of the ship. A copy of each of the approved Stability Booklet is kept for record at the office of the DG Shipping/ MMD, Shipping company, Classification Society office, Shipyard design office, or Design agent of the shipbuilder. However, this final Stability Booklet is not permanent for the entire lifetime of the ship.



There may be a substantial change in the lightship weight, during the 5 yearly Dry docking surveys an inclining experiment is redone and a newly revised stability booklet is prepared by the design office of the shipyard. This is again approved by the classification society.

On other occasions, an inclining experiment is done after damage due to collision, grounding, or even after capsizing in a dry dock. The revised Stability Booklet replaces the original one with all the stakeholders.

**Asit Das**  
Engineering Faculty



## DIFFICULTIES FACED BY SEAFARERS IN THE WAKE OF COVID-19 - Meena Ravi Shankar

(The following has been submitted to the World Maritime University from an alumnus currently serving as Captain of a vessel.)

Every day, new socio-economic problems are being highlighted because of the pandemic. It is no surprise that the restrictions placed to control the spread of COVID-19 have also adversely affected maritime safety and shipping operations. Moreover, it also makes it evident to take a closer look at the plight of seafarers. To get a better understanding of what seafarers are going through during the pandemic, here is a glimpse into the personal experience of a commercial tanker ship captain who throws light on the challenges seafarers were facing.

### A Captain's First-Hand Account of Seafarer Problems

I was on my way from Port Arthur in the US to a port in Latin America when COVID-19 was classified as a global pandemic. We set sail in February 2020 and reached our destination by mid-March 2020. During this time, the number of COVID-19 cases had not only doubled but the virus had already spread to different countries. This led to the introduction of travel restrictions and the introduction of problems that few could have foreseen. From my experience, this has been one of the toughest phases I have endured throughout my entire sailing tenure.

For starters, we entered that port State when there was a global lockdown. Moreover, we required medical assistance as soon as we reached the port. Unfortunately, the severe restrictions enforced and the overwhelming number of COVID-19 cases meant that medical attention was not available for us. Even when we got assistance from a company doctor, the medicines prescribed were not available on board.

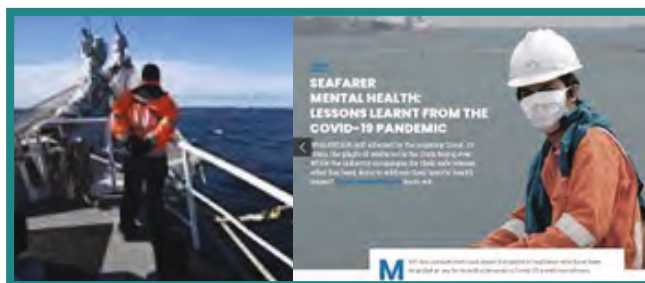
Arranging for these medicines was an impossible task in the lockdown. At best, we were left to fend for ourselves, using the limited resources we had on board. I believe that there is a tangible need to create better contingency plans to provide quick medical assistance to the affected seafarers. This factor fed into our concerns, particularly when it came to the vetting inspection. There is a higher risk of COVID-19 transmission and few chances of self-isolation. While we did relay our concerns via a detailed email that emphasized the heightened risk, it had no effect.

To our surprise, the vetting inspection not only proceeded but was carried out during a time when the said Port State had 20,000 confirmed coronavirus cases and 1,250 deaths. Not only did the inspector survey the ship, but he also did so without gloves or a face mask. We also found out that he had recently air travelled throughout the affected country. Our anxiety, worries, and fears had intensified. It is also surprising to note that such a blatant breach of safety standards was made. The Oil Companies International Marine Forum (OCIMF) provides extensions of up to 18 months for these reports.

Even after COVID-19 protocols were agreed upon, prior to the arrival of the vessel, the implementation was definitely lacking. This was evident in another country we visited when at least 40 visitors boarded the vessel. Social distancing was hardly maintained, with some even showing reluctance to co-operate with the screening process. Even though the accommodation area was prohibited for visitors, they kept entering it and jeopardizing the safety of the crew. Moreover, it has been nearly 4 months since shore leave came to a complete halt. No shore leave for such a long time is detrimental to the wellbeing and health of seafarers.

The crux of the matter is the repatriation of ship crews which has become a major hindrance to international trade. Seafarers cannot disembark from their ships and fly back home, even after completion of their contracts, resulting to face higher levels of stress and fatigue. As of now, around 300,000 shipping crew and personnel are stranded on board with some having remained on ships for nearly 15 months. This is a problem that poses unparalleled risks to supply chain and logistics worldwide.

Though some companies are making an extra effort to arrange crew changes, most of the others are not. While it is an expensive undertaking, some companies are pooling in resources with other companies to charter flights or arrange it themselves.



A few companies are also viewing other options such as diversion of ships to carry out crew changes. Although such steps are welcoming, they do not provide a permanent solution to the crew change issues the industry is facing at this moment. Facilitating crew changes and taking seafarers back home can be a lifesaver for the mental and emotional well-being of the crew.

This is necessary because seafarers play a central role in the global economy. Unfortunately, the global response towards this industry has been slow, cold, and lethargic at best. More active measures need to be implemented to minimize the risks to the global supply chain and to grant relief to the crews. The plight of seafarers and the subsequent safety issues for maritime trade must be higher on the agenda not only for their wellbeing but also to restore order and ensure the supply of necessities.



It is odd that while ports are refusing to welcome seafarers and denying them shore leave, visitors are allowed to board the same vessels without precautions or standard operating procedures (SOPs) to prevent COVID-19 infections. This aspect reveals a lack of concern. Seafarers face a much higher risk of COVID-19 infections since access to medical facilities is extremely limited to them. Allowing at-risk visitors to board vessels without following COVID-19 SOP's, is dangerous. Seafarers should be admitted into ports for much need shore leave or medical support following COVID-19 SOPs.



Furthermore, the global lockdown has restricted the procurement of necessary spares and equipment that are mandatory for the safe operation of a vessel. A major reason is that spares are sourced from different parts of the world. The lack of spares and safety equipment is a major risk factor that jeopardizes the safety of crew members and the property on board the vessel. also to restore order and ensure the supply of necessities.

**Meena Ravi Shankar**  
HR & Soft Skills Faculty



## SHIPBOARD HYDRAULIC SYSTEMS - SKP Singh

### INTRODUCTION

Hydraulics is the branch of engineering that deals with practical problems of collecting, storing, measuring, transporting, controlling, and using liquids. It is used for the generation, control, and transmission of power by the use of pressurized liquids. It differs from fluid mechanics, which is more theoretical and includes the study of gases as well as liquids; and from hydrology, which is the study of the properties, distribution, and circulation of the earth's water.

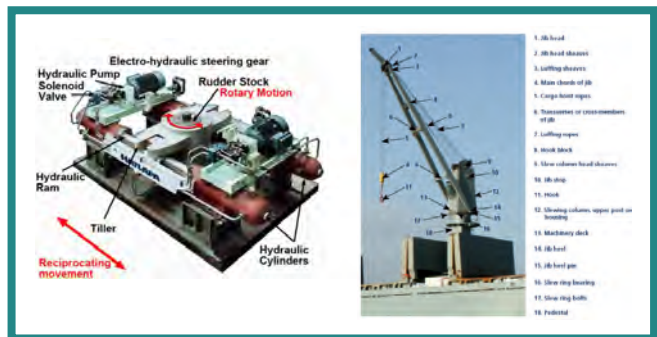
### ADVANTAGES OF HYDRAULIC SYSTEM

1. The lubrication of rotating and reciprocating parts is done automatically by the hydraulic fluid in the system itself.
2. Small components can handle large loads.
3. Hydraulic system design and construction are simple and few parts are there.
4. Hydraulic systems are very flexible. The same power pack can do different jobs at different locations. Only pipes and hoses are required for power transmission.
5. Hydraulic systems can be controlled very easily. Only a lever is required to start, stop or reverse the actuator.
6. Actuator movement can be controlled more precisely which saves wastage of energy and time.
7. In the hydraulic system, the force can be multiplied without levers, pulleys, gears, or chains.
8. Speed can be controlled more efficiently. The motor can be even made to stall.
9. Hydraulic actuator can be stopped or reversed instantly.
10. Constant torque with variable speed can be achieved in hydraulic system actuators.
11. There are inbuilt safeties in hydraulic systems. Actuators can be stalled even at full load.
12. Hydraulic actuator can be stopped by blocking the flow of hydraulic fluid. No separate breaks, linings, etc are required.
13. Hydraulic systems can be used even in hazardous conditions.

### USE OF HYDRAULIC SYSTEM ON BOARD SHIP

A hydraulic system is used on board for the following purposes:

1. Hydraulic cranes or derrick for cargo operations, provision, and spare handling,
2. Hydraulic mooring winches and anchor windlass,
3. Hydraulic capstan,
4. Steering Gear,
5. Hatch covers operation,
6. Deck lifting in the car carrier,
7. Valve operations,
8. Hydraulic nuts and pumps,
9. Pitch control of CPP, bow thruster, and stern thruster,
10. Control of fin stabilizers,
11. Water-tight doors etc.



### MAINTENANCE

Contamination, Heat, and Leakage are the main dangers to hydraulic systems. The poor condition of hydraulic oil is responsible for 75 % of hydraulic system failures. Heat, leakage, and contamination follow each other. It is necessary to keep the system clean, cool, and leak-free. Utmost care should be taken to keep the workplace and the components clean during the overhaul. Do not use cotton rags for cleaning components during overhaul. Prevent contaminants such as dirt, water, cutting fluids, and metal particles from entering the system around the reservoir cover, openings for suction and drain lines, through breather openings past piston rod packing, and through leaks in pump suction lines.

Keeping hydraulic fluids clean begins with good storage and handling practices. Store new fluid in a protected area and keep it in clean, dedicated containers to prevent contamination before use. Clean the top of the container and funnel before adding hydraulic fluid to the reservoir.

Filter indicators should be checked regularly. Full-flow filters designed into the system keep the fluid clean while in service. These filters are often forgotten and go into bypass mode, thus allowing dirty oil to circulate. Inspect fluid filters frequently and change or clean them before they go into bypass mode. Portable filters should be used when transferring new oil from drums or storage tanks to a system.

Hydraulic hoses used should be compatible with the hydraulic oil in the system. Hydraulic hoses should be fitted without kinks or twists. Hydraulic system pipes and hoses fittings should not be over-tightened. They should be just tight enough to prevent leakage. Check all hoses for cuts, abrasions, cracks, and other signs of damage periodically. Never touch a pressurized hydraulic hose assembly with any part of your body. If leakage is suspected, use a piece of cardboard, wood, or sheet metal to locate it.

Hoses should be fitted such that they do not rub against each other or against other parts (causing abrasion, leading to hose failure). Use hose clamps where appropriate to prevent excessive free motion of hoses. Install guards and shields around ignition sources (exhaust manifold, turbocharger, muffler, etc.) and operator areas to keep out fluid if a hose fails. Hoses should not be subjected to a pressure above their maximum working pressure rating in any case. Hydraulic system pressure must be identified, in terms of working pressure and surge pressures, and spikes.

The maker's maximum recommended working pressure (written on the hose) of the hose assembly must be equal to or greater than the maximum system pressure. Surge pressures or peak transient pressures in the system must also be below the maker's maximum working pressure for the hose.

Hydraulic tank oil level, any hot component, leakages, any abnormal sound, tightness of mounting bolts, etc should be checked regularly. Heat develops in the fluid as it is forced through the pumps, motor tubing, and relief valves. In conventional systems, excessive temperatures will oxidize the oil and can lead to varnish and sludge deposits in the system. Conversely, running the temperature too low will allow condensation in the reservoir and increase the likelihood of pump cavitation.

The deposits caused by oil degradation can plug valves and suction screens and cause high-tolerance servo valves to seize and/or operate sluggishly. To allow heat to radiate from the system, keep the outside of the reservoir clean and the surrounding area clear of obstructions. Make sure the oil cooler is cleaned regularly. Reservoirs should be filled to the proper level to allow enough fluid residence time for the heat to dissipate and to shed water and dirt. laboratory for analysis every 6 months.



Fig 1. Inspect hoses regularly for cuts, abrasions, cracks other signs of damage

Fig 2. Install abrasion protection such as spiral wrapping, sleeves, and guards

## SAFETY

A hydraulic system failure can result in equipment damage, production losses, personal injury, or even death. Generally, three types of hazards exist in a hydraulic system:

- i. Burns from the hot, high-pressure spray of fluid,
- ii. Injection of fluid into the skin, and
- iii. Bruises, cuts, or abrasions from flailing hydraulic lines.

Use proper PPE (boiler suit, face shield, gloves, safety shoes, etc) while working on the hydraulic system. Pumps, valves, and motor may become hot; be cautious of incidental contact between bare skin and hot surfaces. Hydraulic systems operate under very high pressures. Shut the system and relieve system pressure before opening any hydraulic circuit. Do not allow spray from any high-pressure leak to contact any part of the body, as serious injection injuries may result. Keep hands and clothing away from moving parts of the system.

The most common injuries by hydraulic systems are due to pinhole leaks in hoses. When hoses fail, tiny holes in the hose, commonly known as pinholes, can eject small, dangerously powerful, yet hard-to-see streams of hydraulic fluid. Pinhole leaks of hydraulic oil can be injected into the skin as if from a syringe. Under no circumstance should the user attempt to locate the leak by "feeling" with their hands, arms, or any other part of the body. To reduce the chances of this type of injury, run a piece of wood or cardboard along the hose (rather than fingers) to detect the leaks.

It only takes a hydraulic oil pressure of 100 psi to penetrate the surface of the skin. Hydraulic oil may escape through a pinhole leak in a hydraulic system at a speed of more than 600 feet per second. Penetration can occur at distances of up to four inches between the fluid source and the skin.

The person experiences only a slight stinging sensation immediately after the injection from a hydraulic system pinhole leak and may not bother much about it. However, the wound begins to throb and severe pain begins after a few hours. The area around the injury turns red and swells within a couple of hours. If left untreated, the injury can lead to amputation and even death. Sometimes, it is too late to consult a doctor and the individual loses a finger or entire arm. The incision may be required to remove hydraulic oil from the affected body part. An injection injury is a surgical emergency and should be treated with the highest priority. Unfortunately, this kind of accident is common.

SKP Singh  
Engineering Faculty



## THE JOURNEY FROM RATNAGIRI TO ZANZIBAR

- Capt Shirang Gokhale

Zanzibar, present-day Unguja, a small island in Tanzania; 20 km from the African coast, has always been considered the base of traders voyaging between the African Great Lakes, the Somali Peninsula, Iran, and the Indian Subcontinent. This island and the capital city Zanzibar have a chequered history, the age of exploration led the Portuguese empire to gain power over it for nearly 200 years, further it fell under the control of the Sultanate of Oman leading to the spice plantation and trade of ivory. In 1890 Zanzibar became a British protectorate before gaining independence in the year 1963.



I found myself alongside this historical island while sailing on a general cargo vessel in the year 1979 – 1980, while cargo unloading is faster and more efficient now, those days it took more than 10 days to unload and I being the duty officer on a fine day found myself looking at a rather Indian looking fellow climbing our gangway. It was very unusual to find Indians in Zanzibar, so being a curious seafarer, I approached him. He introduced himself as the chief engineer of a local passenger ferry harboured next to us. He was looking for some spares for a pump on his ship and was wondering if we could help. Fortunately for him, our chief engineer found the exact spare parts he was in search of.

As he was about to leave my curiosity got the best of me and I finally asked him the question that was on mind my since the moment I saw him on the gangway, "Hey are you of Indian origin?" He laughed and said it is quite obvious from my looks but yes I am indeed from India, Ratnagiri to be precise. Abdul Saitwadekar spoke fluent Marathi and thus began our friendship. We spoke for quite a bit and he invited me onto his ferry and showed me around. It was indeed a great experience to remember.

The next day I found myself at his humble abode for a fascinating lunch, his wife was from the Konkan coast and spoke fluent Marathi and asked me very humbly if I have any Marathi magazines on board. Fortunately, I had a few copies of Sakal Saptahik, Lokprabha, and a few more such publications with me and I was more than happy to present them to her. His grandmother and mother were also from Konkan. He told me how they never married local women from Zanzibar and instead travelled to their ancestral land India to find their life partner. Among such fascinating stories, he told me one which has stayed with me ever since.

His great grandfather Mr Saitwadekar, was a very handy craftsman, shipwright, and exceptional carpenter. He used to build sailing ships, even a few fitted with steam engines in addition to sails. He told me that one day a British businessman namely, Mr John approached his great grandfather and placed an order for 2 vessels of about 300 tons each. He even made an advance payment of 50% but by the time the ships were built and were ready to be delivered, he had shifted his business to Zanzibar.

Mr John requested Mr Saitwadekar to deliver the ships to Zanzibar for which he was willing to pay extra for the voyage and crew. So Mr Saitwadekar set sail with the crew he managed to hire for both ships.

They sailed nearly 3000 miles from Ratnagiri to Zanzibar over the course of 30 days. Mr John was delighted with not just the craftsmanship but also with the dedication he showed and requested his great grandfather to stay back in Zanzibar and offered him a large house and good pay. Mr Saitwadekar could not say no to the respect his workmanship was fetching there, thus he stayed.

The last 3 generations are living in Zanzibar as citizens of the country. They have made their living there in the best way possible. Mr Abdul did his education in the UK and became a chief engineer following in the same shipping industry.

There are many stories of people of Indian Origin reaching as far as the West Indies, South Africa, Madagascar, Re-Union Islands, Mauritius, and ZANZIBAR. The sun never truly sets on the Indian diaspora in the world.

The statement is indeed true, "you can take Indian out of India but you can't take India out of him."

**Capt Shirang Gokhale**  
Nautical Faculty

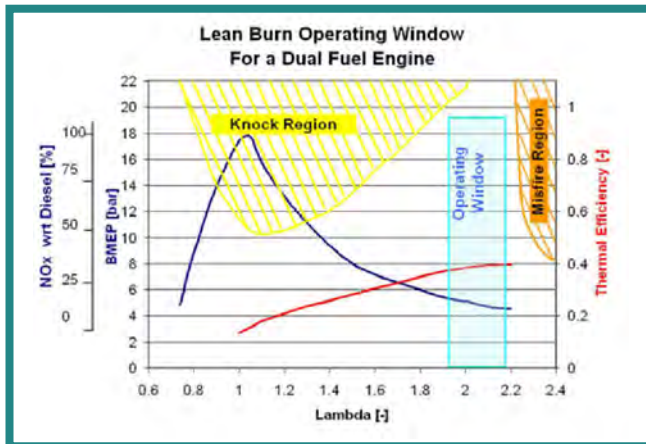


## DUAL FUEL ENGINE - Kishore N Bedekar

### Introduction:

Natural Gas driven Marine propulsion is gaining momentum as ship owners try to meet legislative emissions requirements as well as lowering fuel consumption costs. The use of natural gas has witnessed a significant increase over the last few decades. The marine industry has been shipping large quantities of natural gas in liquid form since the 1960s. Dual Fuel engines were developed initially for LNG carriers to use the boil-off gas, which was used for Boilers and Steam turbines as propulsion engines. In June 2009 Lloyd's Register classed 116 LNG carriers 82% of the vessels were propelled by steam turbines.

The development now is focused on Internal Combustion Engines operating on the Dual Fuel concept. Ship designers are now considering the use of natural gas for non-LNG carriers as well. The latest development is the introduction of LPG as fuel by MAN.



### Dual Fuel Diesel Engine Operating Principle:

Marine natural gas engines typically operate on the Otto principle with homogeneous mixture preparation and traditional flame front propagation. To maximize flexibility engines have been developed to allow the combustion of either Diesel or natural gas and combine both sets of mixture preparation. The figure shows a typical Diesel induction and compression stroke, fresh air is introduced to the cylinder and compressed, just prior to the top dead centre (TDC), Diesel fuel is injected and after a small ignition delay combustion is initiated.

Dual fuel engines were developed to provide maximum flexibility with respect to the fuel selection as well as providing a means to initiate combustion when operating on natural gas. However, due to the knock limitation, the engine power output can be reduced by as much as 25 – 35% when operating on gas compared to conventional Diesel operation.

### The engines are typically designed to operate in one of three modes:

- Dual Fuel (Gas Mode): Homogeneous gas mixture with pilot injection ignition
- Diesel Mode: Conventional Diesel operation utilizing pilot and main injections

- Back up mode: Conventional Diesel operation with the main injection only

Dual fuel Diesel engines can be either two or four-stroke engines and irrespective of whether high or low-pressure gas injection is used, diesel-fuelled pilot injection is required for both. The amount of pilot fuel injected has to be carefully controlled, not enough and the charge will fail to ignite, too much will result in increased levels of emissions-reducing the benefits of burning gas. Engines are always started on Diesel fuel and then changed over to gas operation.

The changeover to gas has to be completed carefully and slowly. As the gas amount is increased the amount of main diesel fuel is reduced to maintain suitable combustion stability especially when operating close to the lean flammability limit. In the event of a fault with the gas supply or a leak being detected the changeover back to Diesel operation is near instantaneous with claims of no loss in power identified.

### MAN Engines 4 Stroke and 2 Stroke:

An example of a 4-stroke engine is the medium speed dual fuel Diesel 51/60DF engine manufactured by MAN. This engine can operate on HFO, MDO, and Gas. Minor modifications would be required to allow a switch between HFO and MDO fuels. The engine uses low-pressure gas at 4 bar and utilizes a throttle to assist with the air-fuel control. The pilot injection is part of a high-pressure common rail system. The engine can only operate in the gas mode for loads between 15 – 100%. Below 15% the engine will automatically revert to Diesel operation. The engine can also operate in a new fuel-sharing mode where any shortfall in boil-off gas can be compensated for by Diesel more than the pilot injection via the main injectors.

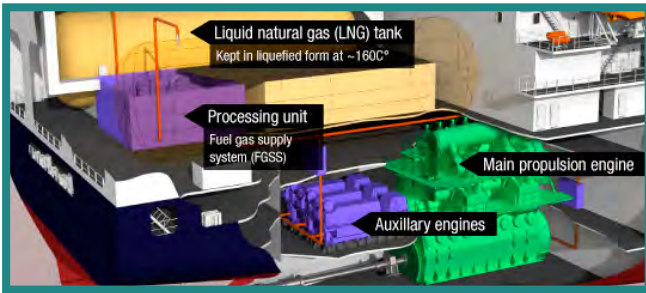
### Therefore, the engines within a propulsion system can be run in two fuel-sharing modes:

- Sufficient BOG: Engines are run on gas.
- Insufficient BOG: Engines run on an equal mix of Gas / Diesel.

One application for this engine is for a 173,600 m<sup>3</sup> LNG carrier in operation and features a propulsion arrangement of 5 inline 8 cylinder engines each rated at 8MW at 514 rpm in a dual fuel Diesel electric configuration. The use of 5 engines provides maximum flexibility with regard to maintenance and breakdowns. Dual Fuel 2 Stroke Engine MAN B&W ME\_GI Dual Fuel engine utilizes high-pressure gas injection. Realizing 250 bar gas injection pressures is not easy, however, three methods are used to achieve this. The first method is to route the BOG to a high-pressure compressor, the second method is to pressurize the liquid gas before vaporizing it in a high-pressure vaporizer, and the third method is to further compress CNG using a high-pressure compressor.

The first system is suitable for an LNG carrier where the quantity of BOG would be sufficient to supply the propulsion system, the second system is suitable for non-LNG carriers but with significant capital expenditure. The last option is viable for smaller vessels with limited voyage durations since the volume of stored gas would be significantly lower than storing liquid gas. The injected gas pressure required is a function of engine load and ranges from 150-250 bar. Typically, a multi-stage (3-5) reciprocating HP gas compressor

would be used to supply a common rail format. To keep the separation between the high-pressure gas and the injector control oil a novel sealing oil arrangement is used. The fuelling control is flexible such that the engine can be operated solely on HFO, i.e. Fuel only mode. The next mode is the minimum fuel mode, where engine loads above 30% would operate on BOG. Lastly, the engine can be operated in a specified gas mode where the area of gas operation can be manually set. The pilot oil injection is approximately 5 – 8% of the 100% HFO quantity. Operation in gas mode below 30% engine load is not possible with this engine Configuration for Non-LNG Vessels.



No methane slip, No gas-quality issues, No multiple de-ratings, No heavy weather issues.  
Gas Fuels - Gaseous Gases (LNG, Ethane...) Liquid 'Gases' (LPG...)

	NO <sub>x</sub>	SO <sub>x</sub>	PM	CO <sub>2</sub>
LNG	20-30%	90-97%	90%	24%
LPG	15-20%	90-97%	90%	10%

Gas Engine Technologies - ME-GI (Gas Injection) ME-LGI (Liquid Gas Injection) LNG / LPG Fuel Use: **Implications to Ship Operation**

- LNG fuel use and bunkering require special crew training  
Complex fuel system can increase maintenance costs
- LNG capable medium speed diesel engines have some operational issues
  - 10% higher fuel consumption when operating on diesel oil compared to conventional engines
  - Some high GHG effect methane is emitted – methane slip
  - Operation on gas at low power (less than 15% MCR) is difficult and may have to manoeuvre on diesel oil
  - Significant safety issues with LNG use on board
  - Especially with low-speed diesel engines that require LNG gas to be raised to high pressure for direct injection into the engine
  - Potential Port Regulations not allowing bunkering during cargo operations can impact vessel schedules
- \*NO SOX scrubbers are required. \*No SCR Unit required.

**Disadvantages:**

- \*The main disadvantage is the provision of two fuel storage and supply systems.
- \*Compromises have to be made to the operation of the engine due to certain limitations. The compression ratio has to be high enough to allow the pilot injection to auto-ignite, however, this, in turn, presents a narrow fuelling range when operating on natural gas due to the engine's knock

limitations. Lean operation is required to satisfy the emissions targets whilst also maintaining sufficient combustion stability.

\*Specialised equipment and machinery, higher maintenance, and spare cost.

**Safety Issues Associated with LNG:**

\*Extreme cold temperature can harm both personnel i.e. frostbite and structures i.e. brittleness. \*High expansion ratio of ~600:1 such that a small volume of liquid can yield a large amount of gas. \*Wide flammability range when compared to conventional Diesel fuel.

\*All gas pipelines have to be double walled and provision of alarm system for indication of leakage.

\*Crankcase protection: For reciprocating engines, suitable protection should be provided to cope with gas within the engine's crankcase. The leakage of gas in the crankcase is a potential explosion hazard. A gas detector and either an oil mist detector or bearing temperature monitor are required to detect a possible hot spot before it can become a potential source of ignition. The gas detector should initiate an alarm when 30% of the LFL is reached and completely isolate the gas supply should 60% of the LFL be reached. Means to provide inert gas injection should be provided upon detection of a high gas concentration.

**\*Bunkering Requirement:**

At present not many bunkering points are available for LNG / LPG in International Ports, however, new bunkering stations are being constructed in worldwide ports. Transport and storage are an issue.

**\*Crew Training:**

The crew will need to be trained and certified for the operation of complex LNG and LPG machinery.

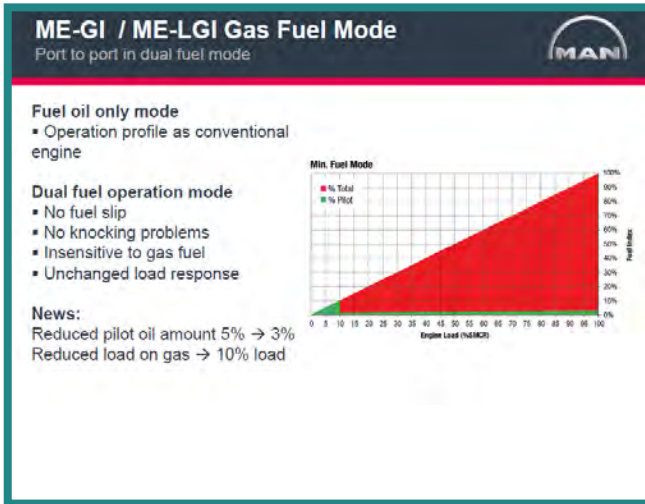
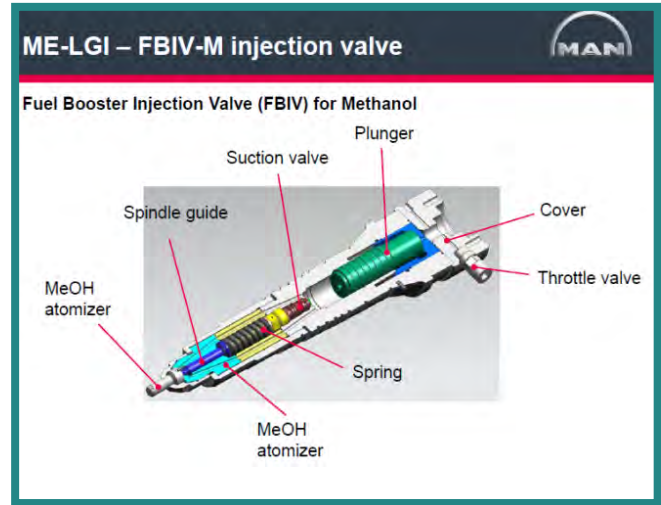
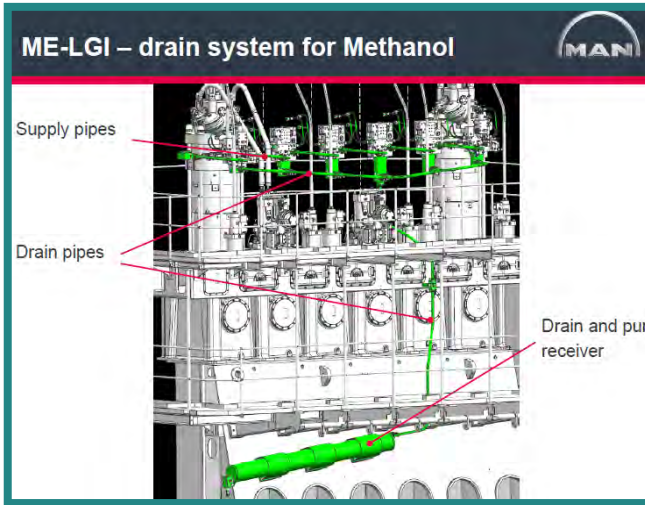
LNG is growing popular as it is considered a cleaner fuel compared to Fuel Oil. During the last few decades, diesel propulsion machinery has emerged as the preferred propulsion medium in the shipping industry. Significant improvements in brake mean effective pressure, firing pressures, fuel injection technology, and turbo-charging efficiency have radically reduced fuel oil consumption in medium-speed four-stroke marine propulsion engines.

**Rules and regulations of dual fuel engine marine application:**

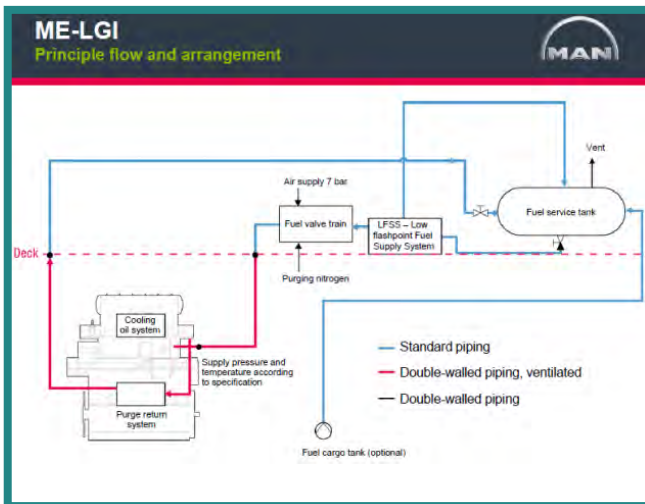
Rules and regulations related to dual fuel engines are mainly related to Safety and hazards associated with Low flash point fuels like LNG. LNG is stored at -160 Degree Celsius which is a very low temperature, personnel exposed to it will suffer severe frostbite and the material will become brittle.

There are also issues with Transport, Storage and Bunkering in general. With particular attention to Engine operation, the crankcase needs to be protected from ingress of LNG / LPG a potential explosion hazard. An adequate monitoring system is necessary.

All vessels subject to SOLAS requirements have to limit the flashpoint of all oils that will be used as fuel to 60 °C or higher (excluding emergency generators) as per SOLAS II-2 regulation 4.2.1. Traditionally ships burning gas fuel could not comply with SOLAS unless covered by an alternative Code.



- ### Conclusion ME-LGI using LPG
- Over all efficiency ☺ In the range of 50%
  - Operational cost ☺ Dependant on the fuel prices
  - Reliability ☺ Unchanged
  - Emission ☺ 97% reduction on SOx
  - Emission ☺ Fulfilling Tier II /alt. Tier III with EGR/SCR
  - Load response ☺ Unchanged during gas operation
  - Pilot oil amount ☺ 3%
  - LPG operation ☺ Gas operation during full load
  - LPG Supply system ☺ Solutions available from Alfa Laval
  - Future marine fuels ☺ LPG widely accepted and available
  - LPG bunkering ☺ Old LPG carriers can be used
  - Available ☺ LPG Engines available from March 2018.



**The following published documents have been identified as useful in specifying the requirements for a natural gas fuelled vessel:**

- IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code). Chapter 16 of the code allows the sole use of methane as a fuel for propulsion devices and auxiliary machinery where allowed by the national administration.
- IMO Interim Guidelines - Safety for Natural Gas-Fuelled Engine Installations in Ships (IGF Code).
- International Association of Classification Societies Unified Requirement M59: Control and Safety Systems for Dual Fuel Diesel Engines.
- Lloyd's Register Provisional Rules for Methane Fuelled Ships

**Kishore N Bedekar**  
 MSc, (Marine Engineering, UK)  
 Independent Maritime Consultant  
 Dry-docking and Retro-fitting ships



**HUMANOMICS - MISSING THE SEA LINK IN INDIA  
(PART OF AN EXCERPT BY THE AUTHOR)**

- Rajesh P Doshi

Just as Economics guides you on the role of Finance in the progress of our society, my emphasis will be on the much more important, yet overlooked, role of Humanity in the progress of society. While Economics is Money centric, the human being is the focus of Humanomics. Developments over the past few centuries have caused the movement of the centres of productive activities from India, which claimed over 25% of the world's Gross Domestic Product (GDP) in the 1700s. Our shipping was destroyed and our ships scuttled by the British and other European navies, to ensure that they controlled the trade and thereby the economy. But peninsular India was and remains an important place on the world sea routes. An intriguing matter for independent "India at 75" is the delay in claiming back the legacy.

Seafaring traditions, though temporarily curtailed, have revived sufficiently for us Indians to make up nearly 10% of the sailors and officers on international merchant ships. India has been the source of quality seafarers, much before India began to churn out young Information Technology (IT) experts for the world, yet the country and its media hardly ever mention the seafaring community, while singing praises about the prowess of our IT engineers. Our sailors are likely to be repatriating almost 90% of their savings in foreign exchange to India, while some of our brilliant software developers are carefully pinching their parents' savings to buy homes abroad. Then what has gone missing? Why is our nation unable to regain its past glory and find its proper position in the multi-polar world of today?

In a line: Our Economists have missed out on Humanomics. The devastated Japanese fought their way out of poverty and became the world's largest and fastest-growing shipbuilders in the 1960s. Following in their footsteps the then war-ravaged Korea rebuilt its economy the same way in the 1980s. The sleepy dragon China, who was behind India up to 1980, too decided that their humans needed work and that controlling the vessels of trade was the way to ensure faster growth of their GDP, and they are now the leaders in shipbuilding, ports, and world shipping.

The major weaknesses the British left us Indians with were:

1. The archaic set of Laws by which every Port Authority was meant to control and tax the ship owners and shippers, not truly to facilitate them.
  2. An anglicized bureaucracy that was focused on 'Collecting Revenue' and indulging in 'Bureaucratic Dadagiri'.
  3. A leadership that only travelled westwards and tried to ape them.
  4. A set of western trained Economists who failed to tap the highly labour-oriented traditional culture and skills of the less literate people of India. Considering "India at 75", the real potential areas have only been paid lip- service to, over the decades, but never enthusiastically acted upon.
- viz  
HOSPITALITY, also called Tourism, needs the least

investment and ensures the highest manpower utilization i.e. maximum jobs created per Rupees one crore invested, in building upon the potential of the beautiful and creative archaeological sites all across the country.

We have just woken up to the need for "ease and comfort of travel, as well as safety for Tourists", but keep repeating "Atithi Devo Bhava".

SHIPBUILDING has the potential to give employment to the largest number of skilled and semi-skilled persons, besides promoting a huge ancillary industry network. It is far more than that of an auto-making unit. Although blessed with a 7500 km. With a long coastline, and the many millennia-old traditions of shipbuilding and ship-owner traders, the present meagre contribution of our country today in Shipbuilding, and also Ship-owning, is a reflection of the priorities of our people in decision-making positions and their implementation skills.

Mazagaon Shipbuilders in Mumbai, Cochin Shipyard in Kerala, Hindustan Shipyard in Vizag, and Garden Reach Shipbuilders, Kolkata received huge Government funds but worked at less than half the efficiency and double the cost. None could compete internationally. Our own Shipping Corporation of India and leading shipping companies were compelled to have their ships built abroad The large infrastructure holders among private shipbuilders of India – ABG, Bharati, Pipavav, .... received a shot in the arm at the start of the twenty-first century but they turned out to be more in the business of money manipulation, and most humans who poured their sweat to build the shipyards met economic doom, also brought down India's reputation as a land of reliable shipbuilders, and drowned their companies.

Today, India has far greater strengths in steel production and ship design, and it is just awaiting a serious, well-thought-through, policy of support for just a decade. Shipbuilding and ship-owning in India need to grow out of its 'cottage industry' mind-set, to achieve large size and scale, then alone they will add tremendously to the nation's economic and security strengths, and further improve the utilization of our human potential – it is a good Humanomics too.

In addition, the tremendous industrial growth and increasing agricultural production have opened up avenues for cheaper and environment-friendly transport of goods by containers on purpose-built vessels on short sea and inland waterway routes. It would decongest highways, and reduce the carbon footprint. These routes do have their own challenges, but the skills to adapt to them are available to specialized shipping and logistics professionals in India.

Our cost of logistics and transportation at about 13% of GDP, is above the average of developed economies. If we could only get over the habit of blindly aping the west, and develop local solutions suited to our topography and trends. The gradual awakening seems to be insufficient in realizing the true potential of both these areas of likely phenomenal growth in India, where Humans play a more important role than just Money.

**Rajesh P Doshi**

DMET 1975

Maritime Entrepreneur  
Chairman, IMEI (Guj), Mumbai



**THE TEN COMMANDMENTS OF A GOOD MARINE ENGINEER - Cawsi P Lilauwala**

1. Thou shall keep thy engine clean and in adjustment that thy life in this company shall be long and that the Owners shall increase thy pay.
2. Know thine Engine and all its parts & functions, else thou shall be in some unholy spot.
3. Be not wise in thine own conceit. Remember the factory instructions and keep them holy, least repairs be thine undoing.
4. Be not loose in the jaw hinges for no man knoweth all about Diesels. The truly wise absorbeth much knowledge and excudeth little and he who doeth so shall gain repute amongst his fellows and favours amongst his superiors.
5. For all things in this life that thou desirth, thou shall also pay plenty and for the wisdom of experience, no less. Advice from the multitudes costeth nothing and is usually worth just that.
6. In the books thou mayest read what to do and when, but only the voice of experience may tell thee why and how, else thy reading of what and when shall plague thee with smoke.
7. God maketh the earth to rotate endlessly without bearings or oil, but not so thy Diesel.
8. Curse not thy Engine when it turneth not, curse rather thine own stupidity.
9. Steam engines and gas engines may long turn over through sloppy, a Diesel not so with gauges and spanners be thou ever busy.
10. The external eye watcheth universal operations, but thou shall not rely upon it for thy Diesel. Thine own vigilance is the price thou payest for thy job.

**Cawsi P Lilauwala**  
DMET 1975  
Maritime Advisor



**MV JAG DHIR**

**CHANCE ENCOUNTER . . . . WITH FOUNDER, GESCO  
LATE MR JAGJIWAN MULJI - Samuel Ponnaiya**

I joined Great Eastern Shipping Co as the 5th Engineer in 1976 onboard Jag Kisan. Later promoted to 4th and 3rd Engineer. It was a fantastic learning experience, the best one for starting a glorious career.



**Late Mr Jagjiwan Mulji**  
Founder GESCO

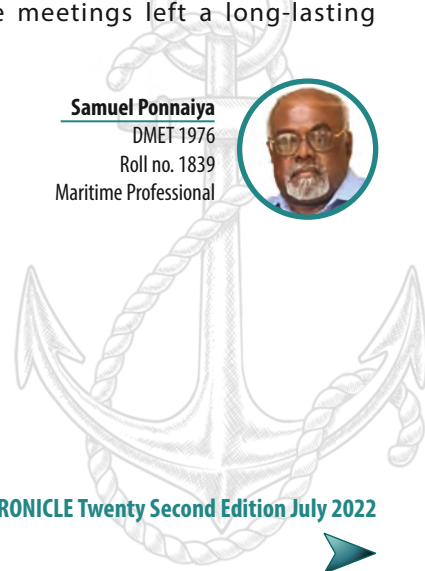
The London Office was run by Mr Jagjiwan Mulji Sir and Ms Brenda. They handled the chartering and arranging of cargo

and we often got orders directly from either of them. They would send coded messages by Morse, like - 'jaldi aao' meaning come at full speed, cargo waiting. Various messages were in Hindi and often caused confusion with some Radio Officers who could not understand Hindi. Instructions from London Office were then always more important than the Bombay Office "TO BE FOLLOWED".

I was privileged to have met Mr Jagjiwan Mulji Sir on two occasions. The 1st time that I met him was in 1977 in Bristol, UK, on-board Jag Dhir. He would visit ships unannounced, communication was poor too. One such time at night, I was 5/E on duty, and this suited, booted Indian gentleman looking more British than a British, 3- piece suit, overcoat, neck scarf, etc., was looking around the engine room. I politely asked him to leave since I did not know him and unauthorized personnel was not allowed in the engine room. If he wanted I would take him to meet the CE. He silently heard me and replied 'That is okay, I am the owner and want to meet the Chief Engineer anyway. For this, I was badly roasted by CE and 2E. What a faux pas!

The 2nd time I met him was also in the UK, he just said with a smile 'You are the person who threw me out of the engine room' Needless to say I looked at him very sheepishly and said 'Sorry Sir'. These meetings left a long-lasting impression on me.

**Samuel Ponnaiya**  
DMET 1976  
Roll no. 1839  
Maritime Professional





## DRONES! A GROWING PART OF THE MARITIME INDUSTRY - Cdt Allan Luis

Whether we like it or not, drones are becoming part of our daily life. Originally developed for military applications, drone technology was quickly adopted by many industries. These autonomous or semi-autonomous flying devices provide unrivalled capabilities, offering new ways to approach difficult, dangerous, or challenging tasks. In the maritime sector, drones are rapidly gaining adoption. From shipboard uses to implementation on offshore energy production platforms and in commercial ports, drones can be found in nearly every aspect of the maritime environment. Maritime industry drones represent a powerful risk management tool that can be used to protect facilities, vessels, and cargo.

They may be operated remotely by someone on the ground or may use on-board computers for navigation and flight. Drones range in size from crafts the size of small aeroplanes to portable pocket-sized models. Drones were originally developed for missions deemed too dangerous or too labour-intensive for humans and were quickly tasked by militaries around the world.

### How drones are being utilized in maritime transport

Drones provide a wide range of tools for industry and can perform dangerous or complex tasks with less risk to humans. In the marine environment, drones have been adopted in four primary roles:

- Inspection
- Surveillance and Security
- Rescue
- Delivery

### CONFINED SPACES:

Indoor inspection such as inside the hull of a ship has many challenges. The atmosphere within a tank is dark and hot, and inside the tanks, inspectors may be exposed to dangerous gases that may not be detectable by smell. Inspections are usually performed by a team of inspectors who must climb on ropes without safety nets. If not ropes, then scaffolding must be constructed within the space. This is a time-consuming, expensive, and dangerous project.

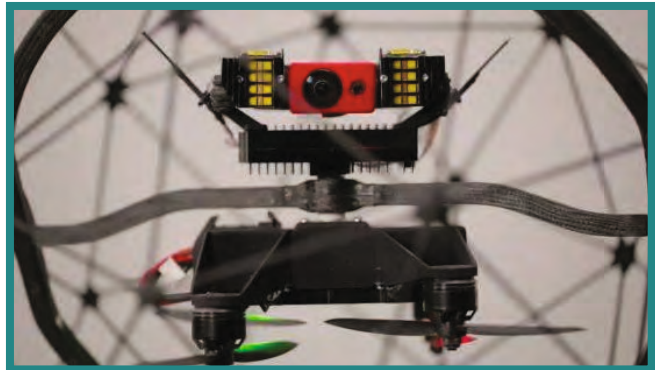
The use of caged drone technology allows inspectors to conduct these inspections in a fraction of the time while eliminating health risks and financial costs. An inspection that normally requires three to four inspectors utilizing ropes, oxygen monitoring devices, and extensive safety equipment can be conducted by one pilot with three flights that can be 10 minutes long each. The caged drone's collision tolerance and on-board lighting allow the pilot to manoeuvre the drone safely and efficiently without any external lighting.

### UNDERWATER:

Drones can also be used to perform visual inspections

underwater. Underwater drones allow port authorities and border security professionals to perform hull inspections on each passing vessel. These underwater drones or ROVs eliminate the need to send a diver underwater and vessels aren't forced to incur expensive delays while dry-docking.

The ROV camera records the condition of the hull markings, rudders, sacrificial anodes, and propellers. Also, the Deep TREKKER ROV system can be outfitted with a thickness gauge to test the thickness of the hull. As technology advances, the use of drones will only increase with features on the horizon such as detailed 3D models of interior assets and more advanced automation. With its use in the air, in confined spaces, and underwater, drones are a crucial time-saving and cost-effective tool for the maritime industry.



### RECENT DEVELOPMENTS:

Approved service suppliers from 1 January 2019, DNV GL approves service suppliers to provide close-up surveys using RIT – e.g. drones, climbers or remotely operated vehicles (ROVs) – for ships and mobile offshore units. The service suppliers must be able to successfully carry out a close-up survey according to the requirements given by DNV GL. Examples of the requirements include relevant training and qualifications of the drone operators, adequate resolution of the live streaming and proper illumination equipment.

### Enhanced Survey Program (ESP) ships:

As the ESP Code is not clear on the applicability of RIT, acceptance from flag authorities is necessary before RIT is used for class surveys on ESP ships (oil tankers and bulk carriers).

**Requirements for certification:**

Programme-specific requirements have been developed based on IACS UR Z17 and included in Class Programme 0484, Appendix A 16 “Firms engaged in surveys using remote inspection techniques RIT) as an alternative means for a close-up survey of the structure of ships and mobile offshore units”.

The new programme was released in February 2019. Please note that ROVs used for in-water bottom surveys are covered by a separate AOSS programme, CP 0484 A3. The Road Ahead However, there are still far more speed bumps to overcome, from improving the distance a drone can travel to its ability to handle heavy and large loads and until these progressions, UAS technology is currently primarily focused on inspection and surveillance

. Drones are only one small part of the bigger puzzle in helping transform and disrupt the maritime industry. What do we know? That UAS play a critical component in the future of the maritime industry in increasing its effectiveness, efficiency and safety; before we know it, the maritime industry will be altered forever.

As the development of drone technology gathers pace for both military and recreational purposes, unmanned aerial vehicles are also becoming more prevalent in the maritime industry. Drone technology will have a significantly impacting in 2018 and will have prolonged ramifications for its future.

While some technologies related to drones are already well advanced, others are still in early development. While drones are already in use in other industries and just need a trigger for them to be adopted in the maritime industry.

**Cdt Allan Luis**  
GME-53



**SMART FIRE EXTINGUISHING DEVICE (SFED)**

- Cdt Altamash Faruk Tamboli

Fire on board a ship is one of the most serious risks for the lives and the property, as well as for the surrounding environment. A smart fire extinguishing device is an advancement of fire-fighting equipment that covers the weaknesses of the traditional fire extinguishers and is more effective in case of fire and safety. Smart words describe the fire extinguishing ball is a device that can be used as an active and passive means of firefighting and doesn't require any technical knowledge for the user before use.

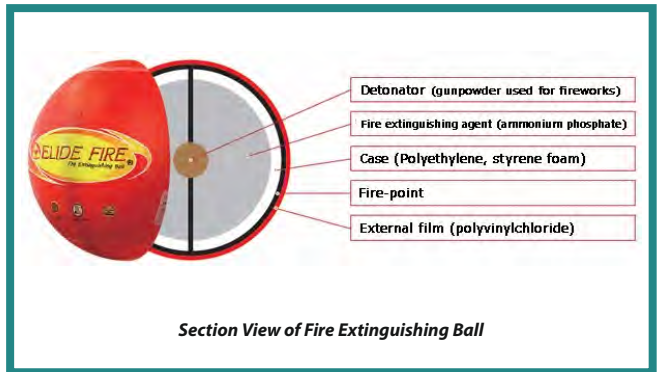
A fire extinguishing ball extinguishes the fire by cutting the chain reaction and eliminating the reaction that occurs during the combustion process. This device is very similar to a grenade, but the only difference is that the debris released through the grenade is harmful to human beings &

surroundings. But the debris i.e. released by this device is neither harmful to humans nor to the surrounding.

It works on the principle of a Blast wave, the wave front in which compression takes place in a region of the sudden change in stress, density, and temp. As soon as the outer layer of the ball comes in contact with fire it retracts, which gives signals to the detonator which is filled with gun powder so it will get triggered and create a blast wave of the whiter powder (Mono ammonium) present in it.

And that white powder will form a thin hemispherical layer around the fire, which will entrap the fire fumes and reduce the friction between the active protons, so the fire will not expand any further. This device activates within 3-10 seconds after coming in contact with fire and it doesn't work on any electrical or mechanical sensor, it works on physical parameters.

When activated it releases a sound wave of 113-119 dB which alarms the person instantly about the fire incident. The dry chemical powder contained in the fire extinguishing ball is not harmful to humans and the environment.



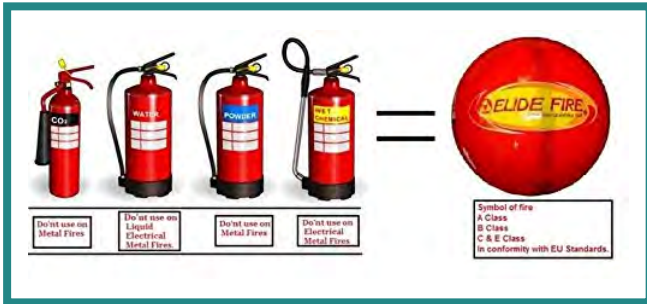
Section View of Fire Extinguishing Ball



Descriptive Figure of Fire Extinguishing Ball

A single ball can eliminate the A, B, C, E, and K classes of fire. The very main difference is the weight ratio; the extinguishing ball is lighter than the existing fire extinguisher. This ball extinguishes the fire in 360 degrees at once but the existing one works at a certain degree to which the person is holding it. This device has a life span of 5 years and is maintenance-free.

This device is much more effective and easy to use compared with the conventional firefighting extinguisher which is used on board. A method for extinguishing fire without harm to humans proximate to a fire extinguishing device.



**Cdt Altamash Faruk Tamboli**  
GME-52



## BIODIVERSITY AND MARITIME ACTIVITIES

- Cdt Shashank Singh

The term “biodiversity”, first used almost three decades ago as a derivative of “biological diversity” today is one of the most often cited terms in both ecological research and environmental management and conservation. However, its precise definition and understanding of the concept vary widely between and within disciplines.

Biodiversity is recognized to encompass “the variability among living organisms from all sources including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.”

When we look at the sea, it is usually hard to imagine what life is like and what species exist beneath the waves. We usually don't realize there is a whole different world down there, with its mountains, valleys, and animals that only a few of us have seen and which remain largely unexplored.

The Earth's tallest mountain, longest mountain range, and deepest canyon are all found in the ocean. The variety of living things that exist in this soup of biological sea life is called marine biodiversity. Globally there are more species of fish in the oceans than all the mammals, reptiles, and birds combined.

Many scientists believe the ocean has far more variety of species than land because so much marine life remains undiscovered. The areas where many species are yet to be discovered lie with the smaller animals and plants and in the deep sea. Some scientists believe that there may be 10 million undiscovered species in the deep sea alone! Marine biodiversity and ecosystem are facing threats from various sources including shipping, fishing, climate change, and emerging human activities such as bioprospecting and deep-sea mining.

The noise produced by ships often travels long distances and

interferes with the normal behaviour of marine species like whales that rely on sound for their activities. Oil spills into the ocean have devastating effects on marine life. Oil remains on the surface of the water blocking the diffusion of oxygen into the water.

Recently, the fourth meeting of the Intergovernmental Conference (IGC-4) was held in New York to conclude a draft of the instrument on the conservation and sustainable use of marine biological diversity in areas Beyond National Jurisdiction (BBNJ). The “BBNJ Treaty”, also known as the “Treaty of the High Seas”, is an international agreement on the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction, currently under negotiation at the United Nations.

This new instrument is being developed within the framework of the UNCLOS, the main international agreement governing human activities at sea. Launched at the One Ocean Summit in February 2022, the High Ambition Coalition on Biodiversity Beyond National Jurisdiction brings together many delegations engaged in the BBNJ negotiations on a common and ambitious outcome at the highest political level.

Sanskrit has always respected and celebrated the environment and this Shloka from Atharvaveda fits perfect in the context- “माता भूमिः पुत्रोऽहं पृथिव्याः ।” which means Earth is my mother and I am her child.

**Cdt Shashank Singh**  
TNOC-32B



## IMPACT OF GREENHOUSE EFFECT ON MARITIME INDUSTRY - Cdt Nikita Nimbalkar

The Greenhouse Effect is a complex process that has been happening since the formation of the earth's atmosphere. The greenhouse effect keeps the heat from escaping the earth's atmosphere out in space. If there was no Greenhouse effect, the earth's annual temperature would have been very low. Some of these gases include Carbon dioxide, Methane, Nitrous Oxide, and fluorinated gases. The potential of these gases to trap heat is what causes the greenhouse phenomenon however due to human activities, the concentration of Carbon Dioxide is increasing rapidly.

In the past few decades, the proportions have soared from 12% to 18%. According to Survey Black Carbon accounts for concerning 21% of the shipping sector creating the foremost industry for emissions. About 962 million tonnes of Carbon Dioxide were emitted throughout the globe whereas the shipping sector in the year 2012. The percentage increased by 9.3% which is about 1056 million tonnes of carbon emission.

Most commercial shipping companies use heavy Fuel Oil since it is much cheaper compared to refined Diesel Oil. But this low-cost Heavy Fuel Oil does not reflect its impact on the environment and human health. When this fossil oil burns It emits Black Carbon that significantly gives rise to climate change.

These invisible soot particles of engine exhaust- drift out of the sky onto the polar ice and snow. This happens even when the ship sails a thousand kilometres away. This soot then accumulates on snow, becomes warm, and then melts. If this goes unchecked, then this melting of carbon snow may have potential harm not solely to polar regions but to the climatic condition around the world. To reduce the Black Carbon, either we need to replace the heavy Fuel oil with alternatives or to improve the overall efficiency.

In 2018 International Maritime Organization (IMO), the establishment of International Shipping determined to form a resolution for the reduction of Greenhouse Gases (GHG) that ought to cut back emissions by at least 70% by 2050. It has created a series of baselines for the quantity of fuel every category of ship burns for a certain cargo capacity. Ships that are inbuilt in the future will have to fit in the eligibility, which will progressively be resilient over time.

An alternative for Fuel could be hydrogen, LNG or hybrid power, etc. New analyses and development have been enhanced to improve efficiency. Technologies have been compelled to reduce the carbon content in fuels or make it zero. Further additional conferences have been conjured by IMO in 2023 to discuss the Mid-term measures to reduce the carbon intensity of fleets by at least 40%.

The necessity to make choices that has less influence on the atmosphere on a much larger scale creates a far larger challenge. Ultimately the only way to reduce emissions from ships without constraining demand is to substantially reduce the volume of GHG emitted per unit of transport supply

**Cdt Nikita Nimbalkar**  
GME-53



**NATIONAL MARITIME MUSEUM**  
- Cdt Harshit Gupta

The National Maritime Museum (NMM) is a maritime museum in Greenwich, London. It is part of Royal Museums Greenwich, a network of museums in the Maritime Greenwich World Heritage Site. Like other publicly funded national museums in the United Kingdom, it has no general admission charge; there are admission charges for most side-gallery temporary exhibitions, usually supplemented by many loaned works from other museums.

The museum was created by the National Maritime Museum Act 1934 under a Board of Trustees, appointed by HM Treasury. It is based on the generous donations of Sir James Caird (1864–1954). King George VI formally opened the museum on 27 April 1937 when his daughter Princess Elizabeth accompanied him on the journey along the Thames from London. The first Director was Sir Geoffrey Calendar.

Since the earliest times, Greenwich has had associations with the sea and navigation. It was a landing place for the Romans, Henry VIII lived here, the Navy has roots on the waterfront, and Charles II founded the Royal Observatory in 1675 for "finding the longitude of places"



The home of Greenwich Mean Time and the Prime Meridian since 1884, Greenwich has long been a centre for astronomical study, while navigators across the world have set their clocks according to its time of day. The Museum has the most important holdings in the world on the history of Britain at sea comprising more than two million items, including maritime art (both British and 17th-century Dutch), cartography, manuscripts including official public records, ship models and plans, scientific and navigational instruments, instruments for time-keeping and astronomy (based at the Observatory).

Its holdings include paintings relating to Vice-Admiral Horatio Nelson and Captain James Cook. The collection of the National Maritime Museum also includes items taken from the German Naval Academy Mürwik after World War II, including several ship models, paintings, and flags. The museum has been criticized for possessing what has been described as "looted art". The museum regards these cultural objects as "war trophies", removed under the provisions of the Potsdam Conference.

In late August 2018, several groups were vying for the right to purchase the 5,500 RMS Titanic relics that were an asset of the bankrupt Premier Exhibitions. Eventually, the National Maritime Museum, Titanic Belfast, and Titanic Foundation Limited, as well as National Museums Northern Ireland, joined together as a consortium that was raising money to purchase the 5,500 artefacts. The group intended to keep all of the items together as a single exhibit.



The oceanographer Robert Ballard said that he favoured this bid as it would ensure that the memorabilia would be permanently displayed in Belfast (where the Titanic was built) and in Greenwich. The museums were critical of the bid process set by the Bankruptcy Court in Jacksonville, Florida. The minimum bid for the auction on 11 October 2018 was set at US\$21.5 million (£16.5m) and the consortium did not have enough funding to meet that amount. CAIRD MEDAL The Caird Medal was instituted in 1984 to mark the fiftieth anniversary of the National Maritime Museum Act 1934 that established the museum. The medal is awarded annually to "an individual who, in the opinion of the Trustees of the National Maritime Museum, has done conspicuously important work in the field of the Museum's interests and is of a nature which involves communicating with the public."

The medal is named for Sir James Caird (1864–1954), the principal donor at the founding of the National Maritime Museum. The museum awards the Caird Medal annually in honour of its major donor, Sir James Caird.

**Cdt Harshit Gupta**  
TNO-33



## SOME MARINE TERMS

- Cdt Tarun Singh Narnoliya

- 1. ABAFT** - Toward the rear (stern) of the ship.
- 2. AAOSA** - Always Afloat or Safe Aground. Condition for a vessel whilst in port.
- 3. ATHWARTSHIPS** - At right angles to the centreline of the ship.
- 4. BALE CAP** - Cubic capacity of a vessel holds to carry packaged dry cargo such as bales/pallets.
- 5. BEAM** - The maximum breadth of the greatest width of a ship.
- 6. BOW** - The forward part of a ship.
- 7. BULKHEAD** - A vertical partition separating compartments.
- 8. CONS** - Consumption.
- 9. FUMES** - Often harmful gas produced by fires chemicals, fuel, etc.
- 10. HALF CARDINAL POINTS** - The four main points lying between the cardinal points: northeast, southeast, southwest, and northwest.
- 11. HAMPERED VESSEL** - A vessel restricted by her ability to manoeuvre by the nature of her work.
- 12. ICING** - Coating of ice on an object, e.g. the mast or superstructure of a vessel.
- 13. LEEWARD** - On or towards the sheltered side of a ship.
- 14. LEEWAY** - Vessel's sideways drift leeward of the desired course.
- 15. OFF AIR** - When the transmissions of a radio station etc. have broken down, been switched off or suspended.
- 16. FOUL (OF ANCHOR)** - The anchor has its own cable twisted around it or has fouled (entangled) an obstruction.
- 17. DWAT (OR DWT) DEADWEIGHT** - Weight of cargo, stores, and water, i.e. the difference between lightship and loaded displacement.
- 18. LIGHTSHIP** - the weight of the ship with all its permanent equipment, excluding cargo, person ballast, dunnage, and fuel but including permanent ballast and water used to operate steam machinery.
- 19. LOAD DISPLACEMENT** - It is the total mass of the ship when she is floating in salt water with her summer load line at the water surface.
- 20. DEAD WEIGHT** - It is the total mass of the cargo, fuel, fresh water, etc. that a ship can carry when she is floating in salt water with her summer load line at the water surface.
- 21. SUMMER LOAD LINE** - It is the primary load line from which other load lines are derived.
- 22. PLIMSOLL LINE** - It is a reference mark located on the ship's hull that indicates the maximum depth to which the vessel may be safely immersed when loaded with cargo.
- 23. FENDER** - A cushion, placed between ships, or between a ship and a pier, to prevent damage.
- 24. FWAD** - Fresh Water Arrival Draft.
- 25. FWDD** - Fresh Water Departure Draft.
- 26. HATCH** - An opening in a ship's deck fitted with a watertight cover.
- 27. HULL** - The main body of a ship.
- 28. KNOT** - A measurement of speed equal to one nautical mile.
- 29. LOG** - A record of courses or operations. Also, a device to measure the speed.
- 30. MANIFEST** - Inventory of cargo on board.
- 31. PORT** - The left side of a ship looking forward. A harbour.
- 32. STARBOARD** - Right side of a ship when facing the front or forward end.
- 33. STERN** - The aft-most or after part of a ship.
- 34. ALLISION** - The striking by a moving vessel against a stationary object.
- 35. VLCC** - Very Large Crude Carrier. A tanker of 200,000 to 319,000 dwt. It can carry about 2 million barrels of crude oil.
- 36. VANNING** - A term for stowing cargo in a container.
- 37. ULCC** - Ultra Large Crude Carrier. A tanker in excess of 320,000 dwt.
- 38. TRANSSHIP** - To transfer goods from one transportation line to another, or from one ship to another.
- 39. VOYAGE** - A long journey by sea or in space.

Samuel Plimsoll (10 February 1824 – 3 June 1898) was a British politician and social reformer, now best remembered for having devised the Plimsoll line (a line on a ship's hull indicating the maximum safe draught, and therefore the minimum freeboard for the vessel in various operating conditions).

**Cdt Tarun Singh Narnoliya**  
TNO-33



## WOMEN IN MARITIME INDUSTRY

- Cdt Yasmin Pattan

The maritime industry has always been viewed as a place for men and many people even to this day think it has no place for women in any way possible. But with the world fast-changing, industries have become more inclusive. The lingering stigma about working at sea gives rise image of the bulky overly sunned man. But that is not the case anymore, the integration of women in the industry is happening faster. With a very needed development, it is clear that jobs are never gender-biased and all it takes is strength and determination to be the best in any profession despite any gender.

There are many who fear the unknown and the marine industry is such; with very few women in the industry, there is a lack of information and motivation for young girls to come forward. There is a constant fear of judgment and being told as to what a girl can and can't do, which not only demotivates them but also creates the stigma of females being weak. There are indeed times when people try to make girls feel they are incompetent and weak instead of inspiring them to chase their dreams. Women have proven countless times that they are capable of doing and achieving a great deal and have also shown everyone that working at sea can be as rewarding for them as it is for men.

Although women form about 39.3% of the global workforce, women seafarers constitute only 2% of the total number of seafarers worldwide, creating the need to bridge this gender gap. Lack of encouragement from family friends and society, absence of relevant educators and counselling, as well as fear of bullying and sexual harassment are the key factors impeding women from choosing a marine career.

Women in history made leaps into the once male-dominated industry for various reasons, such as wartime duty, support for their families, making a better life, getting the respect they deserve, paving a path for other women, to make a better life for themselves, or even to just find the adventure and thrill with new surroundings.

Entering a new man-oriented industry was never easy for women, history says women disguised themselves as men to work aboard a sailing vessel, but once discovered their career would come to an abrupt end. By being aboard the ship with their husband or father, many women would learn how to operate and navigate a vessel. In some British sailing vessels of the 19th century, the captain's daughter or wife was allowed to work as a stewardess on the ship. In 1974, the first group of women was admitted to the United States Merchant Marine Academy in Kings Point, New York. One of them, Captain Wagner, became the first woman to earn the unlimited Master's License. She went ahead to become a harbour pilot in San Francisco, shocking enough she remains the only female harbour pilot even to this day.

Another name in the industry that stands as a strong motivation is Belinda Bennett, the world's first black cruise

ship captain. She worked aboard Windstar Cruises for over 14 years through the Caribbean in winter and Europe in summer. She received the United Kingdom's most prestigious Merchant Navy Medal for Meritorious Services.

In 2017, the International Women Seafarer's Foundation (IWSF) was founded to not only help young women seafarers but also to create employment for women. A few women from the Indian Merchant Navy Industry, Captain Radhika Menon, India's first female Captain, received the exceptional Bravery at Sea Award by IMO. Poonam Devangan, recipient of Varuna Award.

Sharvani Mishra, 1st lady engineer to sail on an Indian flag vessel. Reshma Nilofer Naha is India's 1st woman marine pilot and one of the elite few women River Pilots in the World. And finally, we have our own Ms Shilpa Nitin Bhandurge, the 1st Lady examiner at DG shipping, she is an external examiner for not only ETO COC Exam but also for MEO Class IV COC Exam; she has sailed in Jag Pankhi and Jag Pradeep from GESCO.

In recent years, the number of women working in the maritime industry has grown but there's still more work to be done. Many shipping companies are undertaking active initiatives to increase the number of women. However, the mindset should change and if you believe in yourself and have strong determination to pursue your dreams, we can make the impossible possible. Take successful woman marine engineers and deck officers as an inspiration to achieve dreams of sailing on the high seas.

Cdt Yasmin Pattan  
GME-53



## TUNGARLI HILL—COMMUNICATION TOWER TREK

- Cdt Rakshit Mishra

The news about the trekking expedition sent our pulse racing since we were closeted up on the campus with no shore liberty owing to pandemic restrictions in force. In anticipation of the trek, we hardly slept a wink the previous night and woke up pronto at the scheduled time of around 0430 hrs. All of us mustered near the gate at 0530 hrs.

The trek was led by our Course-in-Charge Mr Narendra Katdare and assisted by the PTI Awdhesh Yadav. After brief instructions from him about the safety precautions to be observed, we set out for the trek in the wee hours of the morning.



"The best view comes after the hardest climb." – Elevation 828m

### Early morning muster before Trek:

Mr Narendra Katdare leading from the front with Mr Yadav at the rear flanked our formation keeping vigil over the cadets. We had started in the morning to beat the summer heat and it was still dark. The morning was crisp and refreshing as our road paved through some celebrity bungalows like Asha Bhosle's house.

Slowly and steadily the road ascended into a steep incline and the path meandered across densely wooded landscape skirting the road on either side. The uninitiated were soon out of breath; however, the adrenaline soon kicked in due to the tempo of the trek and the exhaustion gave way to excited anticipation of exploring the unfolding journey.

After the incline, the road plateaued off at the old Tungarli dam, which encloses a small waterbody fed during the rainy season. Most of the overflows from this dam are fed into the larger adjoining Valvan lake. Due to aging, there are fissures in the stoned wall embankment from where the water drips and cascades down the hill slope. Though this leakage prevents the retaining of larger water bodies throughout the year; the seepage also helps flourish the flora and fauna where the trickled water finds its way.

It is surprising to note that during the arid season; the barking deer stray from the wilderness and are often sighted near this area in a hunt for water. The view was amazing as we continued around the path we were able to see the "Gold Valley" down the hill. The lights of the colony across the morning twilight provided a magical sight. After a brief saunter across a concreted road, we soon hit the forest dirt track covered with stones and pebbles. We were blessed by the company of a dog who was faithfully accompanying us and seemed to be the beacon for course navigation.

We had the first clear view of the majestic tower atop the hill which was our destination. The entire panoramic view beckoned various trek routes to be explored by us. One such exhilarating trek route traversing the entire mountain ridge starting from the Gold Valley and terminating near the mountain base was explained to us by Mr Narendra Katdare. After trudging a few miles on the dirt road, we had to leap over the mountains, where the real adventure started.

The birds chirping and the insects buzzing presented a melodious orchestra of sounds as we ambled through the jungle up the mountain slope. It is then that we realized that hiking through the countryside gave us a feeling of being independent.

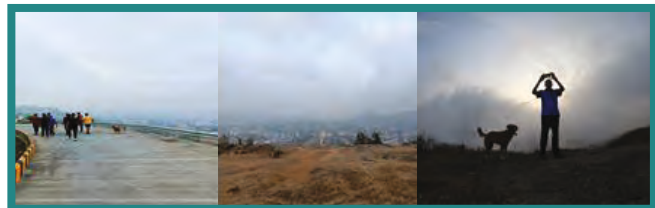
The mind is independent as well. We are away from the noise and din of the city life. While walking through the jungle, which was very calm and quiet, we felt at peace. The only discipline and etiquette required to be observed is to ensure that we don't lose our foothold while ascending the slope. We were chatting and gossiping freely giving free vent to our emotions and feelings. Our suppressed thoughts came to the fore during our trek. The pure mountain air of the hills and the open places of the meadows loaded with the sweet fragrance of the flowers revitalized our life and limbs.

Mr Narendra Katdare led us through the canopy of the thick forest cover, making our way to the communication tower. Once on top; we could see the Balumama temple and Valvan dam from this spot. Our route was crisscrossed with the Karyy trees which bloom once in seven years; as explained by Mr Narendra Katdare. The communication tower, atop the hill, was built by railways during the commissioning of the Lonavala Station.

The entire valley was filled with fog obscuring a clear view. Despite that; Mr Narendra Katdare explained the entire topography of the adjoining area with features like Dukes Nose, and the forts of Korigad, Tunga, Tikona, Lohgadh, and Visapur. We could also admire the beauty of Rajmachi forts visible at a distance. One after another, we could not take our eyes off the breathtaking view.

Mountains on one side and the other side dominate the picturesque view of a deep gorge. Some were capturing the surroundings on their phones; some were lost in the Beauty and were mesmerized by the scenic view of the environment. Every day we used to watch this tower from our mess, it was such a delight to be standing next to it.

A few minutes later, we all started moving down. We took a different path on the way down, crossing the Patel dam which provides a watering hole for the animals during the



The topography being explained by Mr Narendra Katdare

arid season. The trekking route to Rajmachi hills, a 19km trek could be seen as we scampered down. We were back around 7:30 am at the campus gate where a final head count was done before being dispersed.

Trekking is an experience that teaches you a lot of lessons. One realizes the importance of teamwork, physical wellbeing, goal orientation, time management, and lots more. It is an enjoyable journey and you feel internally satisfied when you reach the mountain top.

Someone rightly said, 'You can take a man out of a mountain but you can't make a mountain out of a man.'

The beautiful memories of the trek will remain forever etched in our minds and inspire many of us to have mountain climbing on our bucket list.

And to sign off with an Edmund Hillary quote "It is not the mountain we conquer; but ourselves".

**Cdt Rakshit Mishra**  
GME-52



### IMPORTANCE OF RECREATIONAL ACTIVITIES ON THE GO - Cdt Tarun Singh Narnoliya

Before jumping directly into the topic we must understand it in a short note. As we all know Recreation is an activity of leisure.

All those activities that people choose to do to refresh their bodies and minds and make their leisure time more interesting and enjoyable. The need to do something for leisure is an essential element of human biology and psychology.

Physical activity is an important part of a person's life and is being neglected a lot nowadays. Running a mile or an early morning walk has always been a new year's resolution for some peers. In such scenarios health and psychological problems like high blood pressure, anxiety, arthritis, obesity, and depression are more likely to develop.

Therefore, praising the efforts in this very important aspect of growth, cure and development is essential, and to spread the word to inculcate such hobbies among all is worth trying.

For having a good and healthy lifestyle one should focus on two things, the first is nutrition, and secondly some good amount of physical activity. If we take Jogging/brisk walking/running or YOGA as an example of physical activity in one's routine, I would like to highlight some of the important features that such exercises bring:

1. Development of strength and endurance.
2. Cardiorespiratory endurance
3. Joint flexibility and body composition
4. Combats health conditions and diseases
5. Promotes better sleep and reduces stress hormones

6. Promotes a sense of camaraderie
7. A healthy and strong heart with good stroke volume.

Training with outdoor activities includes some additional health and psychological benefits like self-confidence, better personality, quality of determination and ability to take initiative, stamina, and most importantly focus which is very important to strive in any organization.



Not only outdoor rigorous physical training but some productive hobbies like art and craft, singing and playing instruments, writing stories, reading novels, playing chess, or board games also develops focus and psychological satisfaction in one's day. Being a cadet at GEIMS I would like to throw light on the facilities or opportunities that are already provided by our institute.





1. Football ground
2. Basketball ground
3. Volleyball ground
4. Running area
5. Swimming pool
6. Recreation hall (table tennis and carrom board)
7. Gym
8. Track, full of greenery

Being here we are having really good opportunities to involve ourselves in some kind of activity that will add up to our overall growth of body and mind.

"To enjoy the glow of good health, you must exercise"

GENETUNNEY (AMERICAN PROFESSIONAL BOXER)

So again I would like to motivate and spread this message that Yes, you can do it, it's time to convince your body and mind.

**Cdt Tarun Singh Narnoliya**  
TNOC-33



## WILDFLOWERS - Nikita Nimbalkar

She always thought of a fresh start,  
Just as a dried seed is ready to be sown.  
She was always questioned about her ability,  
Just like wildflowers for their existence.  
She wasn't here to just look pretty and sit still,  
People admired her for surviving but she lived like a  
diffused flame.

She was just like wildflowers.  
Unless you really saw you couldn't see the beauty in her.  
But once you see the beauty in her,  
you couldn't let it go.  
She wouldn't be the flower that you gift to someone for  
fragrance or looks.

But if you looked at her the right way,  
you could see her grow into you,  
amongst all the greens.  
She could be an irritation in the field of roses for one's  
perception.

But she always existed everywhere,  
you could throw her out, cut her down or remove her  
from the roots.

She would always grow back into a new place soon.

She is just like a wildflower in a world full of roses.  
Growing everywhere and any place just to show her  
determination.

Never giving up even on Sand or Stones.

She is just Like a wildflower.

**Cdt Nikita Nimbalkar**  
GME-53



**FANTASY ECSTASY - Cdt Samnoon Sakharkar**

We sat looking at the waves crash  
 her morning eyes and the sun-up sky  
 saying nothing but expressing everything  
 feeling no words are even necessary.  
 Next to the mountain near the trees  
 out of all the things my eyes can see  
 it's just you and your open curls, which imprint on me.  
 Staring at the bright milky clouds, fancying;  
 if my vision was flawed or witnessed imperfect perfection.  
 Turning away I sigh in the cold breeze of air  
 my feelings shied as they fell back on earth  
 realizing it's just a star in love with the sun.

**Cdt Samnoon Sakharkar**  
 GME-53



**SLEEPWALK - Cdt Ankit Sharma**

Strolling down the dark streets  
 With my eyes closed, and my bare feet  
 Like lines yellow on the road  
 You're easy on my mind...  
 Holding to your memories,  
 An illness, all alone here...  
 I'm sleeping sailing in the stillness  
 Yet somehow moving on  
 I never had dreams that went well  
 At least, not since the last love  
 I had gone away  
 But now, I find you here in stride,  
 Rolling like a tide...  
 With waves washing shore...  
 Going down to nowhere, with nothing  
 But your sweet sound that I'm chasing...  
 I'm sleepwalking for your love

**Cdt Ankit Sharma**  
 TNOC-33



**WISHES - Cdt Pranav Gaikar**

I wish  
 Your memories could be written with an inked pen,  
 Easy to erase just with a splash of water  
 I wish  
 We could stay Friends  
 I just wish  
 But sadly life doesn't work that way  
 Does it?  
 Your memories got carved in my heart  
 I wish  
 Forgetting could be easy  
 I wish  
 We could have worked it out a little  
 And this story could have been different,  
 I wish  
 You could have gathered a little courage  
 But what's the point  
 If your wishes are different.

**Cdt Pranav Gaikar**  
 GME-53



**JOKES - Capt Ravi Shankar**

1. No ... you change your course!  
 Dead ahead, through the pitch-black night, a captain sees a light on a collision course with his ship. Reaching for the radio, he says: "Change your course ten degrees east."  
 "Change yours ten degrees west," comes the reply.  
 The captain responds, "I'm a navy captain! Change your course, sir!"  
 "I'm a seaman second class," the next reply comes back.  
 "Change your course, sir!"  
 The captain is furious. "I'm a battleship! I'm not changing course!"  
 The man replies, "I'm in a lighthouse. Your call!"

2. Question:  
 Why most of the engineering students Can't clear all subjects in 1st attempt...?  
 Answer:  
 Smooth roads never make good drivers,  
 Clear sky never makes good pilots  
 &  
 Clearing all subjects in the 1st attempt,  
 Never makes good engineers.

3. Height of confidence  
 Once many professors were called and asked to sit in an aeroplane.  
 After they sat. They were informed that the plane is made by their students.  
 All of them ran and got out of the plane except one.  
 People asked him the reason  
 He said, "If it's made by my students it will not even start."  
 Air and students have the same mentality  
 Don't you know how?  
 Both keep turning the book's pages without reading



**Capt Ravi Shankar**  
 Nautical Faculty



**CHHATRAPATI SHIVAJI MAHARAJ**

- Cdt Onkar Tonage



*A Pencil sketch of Chhatrapati Shivaji Maharaj (1630-1680)  
 Size A3(297 x 420 mm)*

Chhatrapati Shivaji Maharaj was born at Shivneri, Pune Dist. He was an Indian ruler and a member of the Bhonsle Maratha clan. Shivaji Maharaj carved out an enclave from the declining Adil Shahi Sultanate of Bijapur that formed the origin of the Maratha Empire. He was a great warrior and administrator. He fought Hindu persecution throughout his life but practised true religious tolerance.

The Indian Navy considers Chhatrapati Shivaji Maharaj as the 'Father of the Indian Navy'. We can proudly say that he laid the foundation for the Indian Navy.

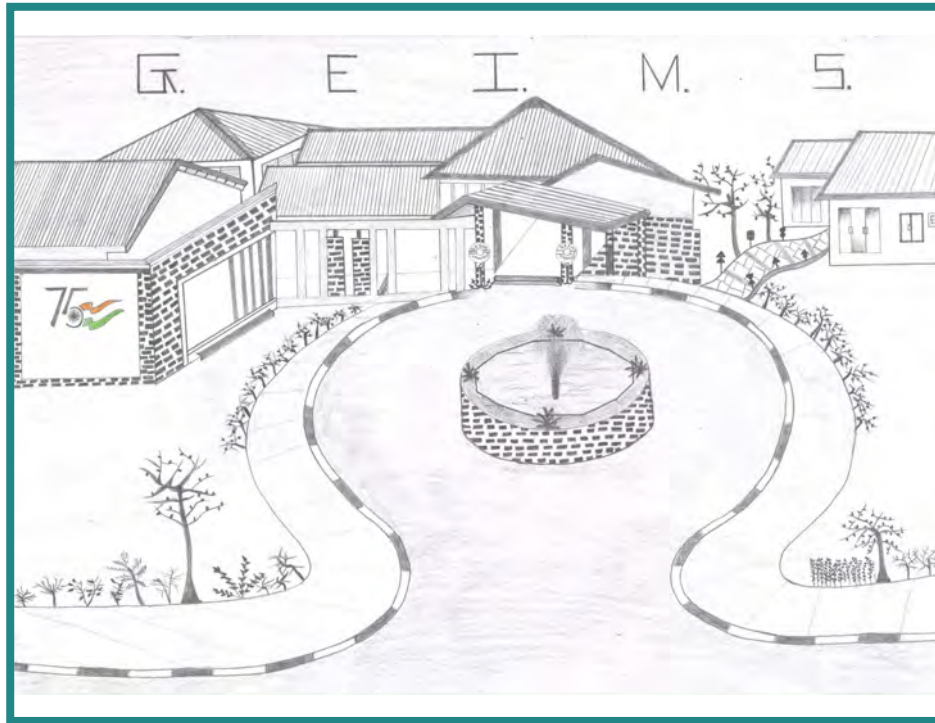
Shivaji Maharaj built his ships in towns such as Kalyan, Bhivandi, and Goa. His fleet grew to reportedly 700 ships for trade and war. Shivaji Maharaj was a hero and is in the hearts of millions. His love and selflessness made him special to all. He was very well-known for his military tactician.

The birth anniversary of Shivaji Maharaj on 19 February is celebrated with much enthusiasm to honour him.

**Cdt Onkar Tonage**  
 GME-53



INSTITUTE SKETCH



Cdt Himanshu Patel  
GPR-08

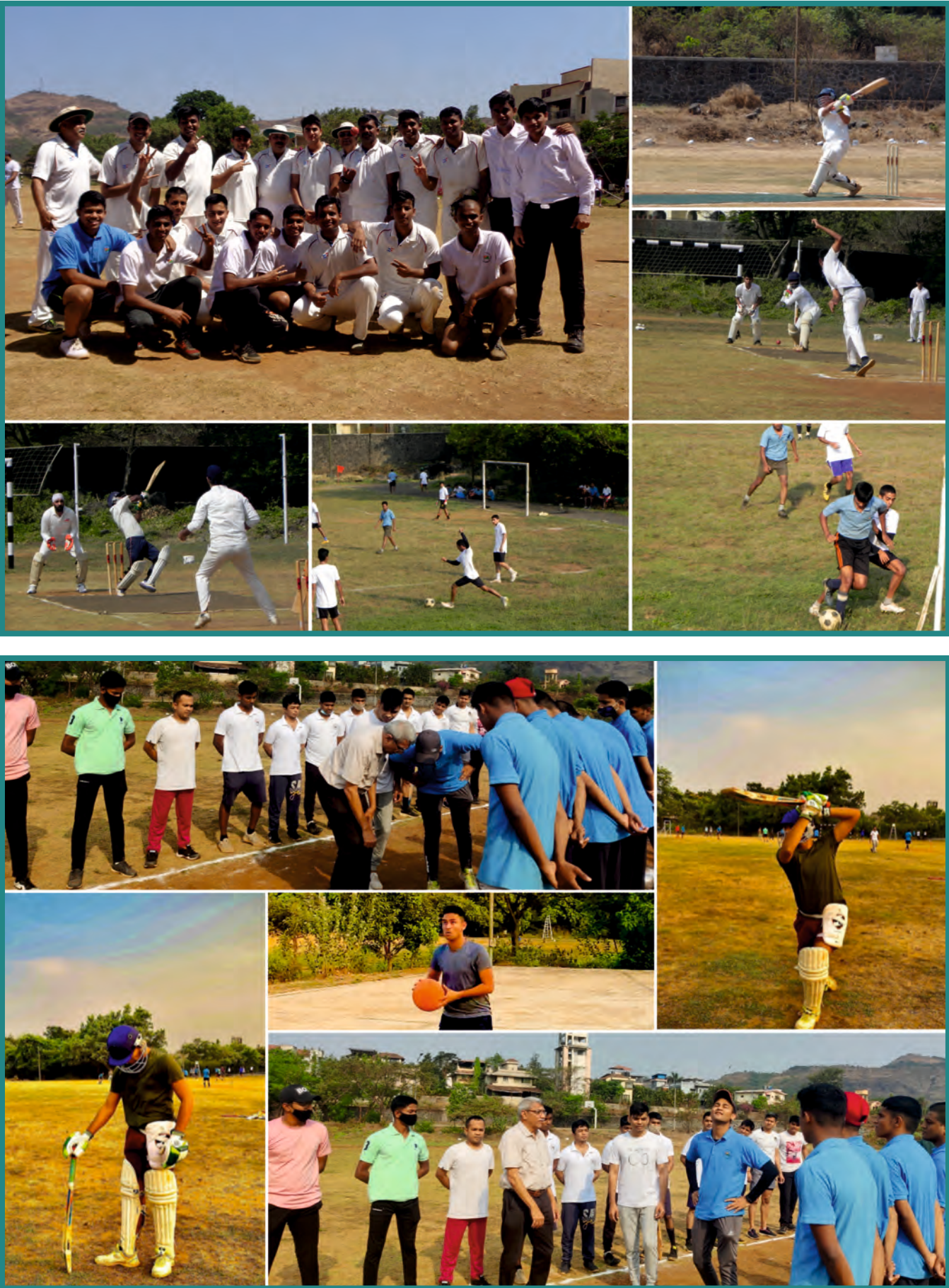


CHANGING PHASES OF TIME



Cdt Yasmin Pattan  
GME-53





THE PASSING OUT CEREMONY, OF GPR-07, ON 11TH APRIL 2022



THE PASSING OUT CEREMONY, OF GME-51, ON 04TH MAY 2022



THE PASSING OUT CEREMONY, OF GME-52, ON 30TH JUNE 2022



THE PASSING OUT CEREMONY, OF ETO-25, ON 01ST JULY 2022



**Capt Prakash Correa**

Excellent preparation for the passing out parade, and program of the TNOG 31 batch. Impressive Training and discipline are imparted to the cadets by the faculty. Kudos to the team of GEIMS.

11th March 2022

**Capt Sujit Churi**

GP Rating 07 batch passing out. Excellent experience mesmerising. Asset for the organisation. Best of luck and congratulations.

11th April 2022

**Mr David Birwadkar**

The highest standards are well maintained. Proud to be part of GEIMS and its wonderful setup, people and everything about its local, landscaping, infrastructure and the people operating same. Best of luck.

04th May 2022

**Capt Trevor Fernandes**

Wonderful experience visiting GEIMS. Visited various Workshops, Classrooms and am impressed with the Equipment, Facilities and Training of cadets. Thanks to the management for cooperation & hospitality during our stay. Well done and all the best.

30th May 2022



**JAG VASANT**  
Vessel Type - LPG Tanker  
Summer DWT- 54478 t  
Year Built - 2006



**JAG ARNAV**  
Vessel Type - Bulk Carrier  
Summer DWT - 81732 t  
Year Built - 2014



**1ST SHIP OF GESCO**  
JAG JIWAN





**MS PRAJAKTA KADAM**

QUALIFICATION : Pursuing TY B.com  
 DESIGNATION AT GEIMS : Admin Assistant  
 TOTAL EXPERIENCE : Fresher  
 DATE OF JOINING : 13 June 2022



**CPO RANJIT SINGH (Retd.)**

QUALIFICATION : Graduation  
 DESIGNATION AT GEIMS : Warden  
 TOTAL EXPERIENCE : 15years in the Indian Navy  
 LAST ORGANISATION WORKED WITH : Indian Navy  
 DATE OF JOINING : 02nd May 2022



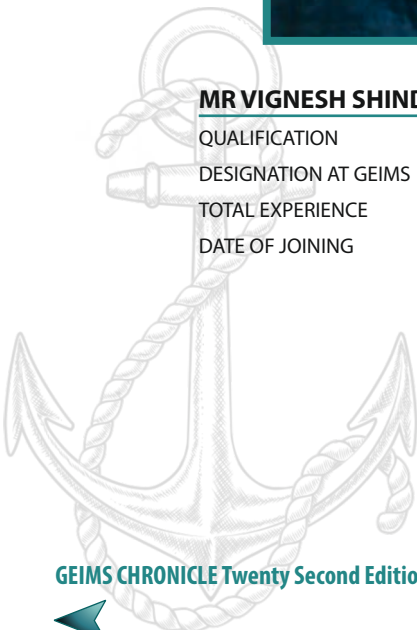
**MR VIGNESH SHINDE**

QUALIFICATION : B.Com  
 DESIGNATION AT GEIMS : Assistant Librarian  
 TOTAL EXPERIENCE : Fresher  
 DATE OF JOINING : 25th April 2022



**CPO JALESHWAR YADAV (Retd.)**

QUALIFICATION : Graduation  
 DESIGNATION AT GEIMS : Warden  
 TOTAL EXPERIENCE : 13 years  
 LAST ORGANISATION WORKED WITH : MMTI  
 DATE OF JOINING : 02nd May 2022





**Mr G Shivakumar**  
Chief Financial Officer

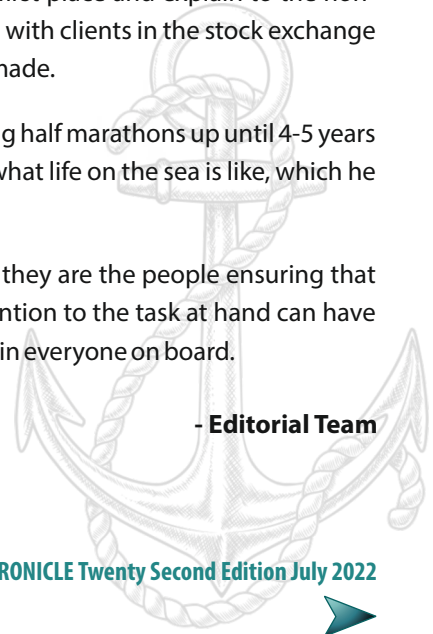
Mr G Shivakumar, the Chief Financial Officer at The Great Eastern Shipping Company Ltd, was born in Madurai, Tamilnadu, his father being a State Bank of India employee, has spent his childhood in various parts of the country such as Chennai, Bangalore, and Mumbai. He pursued his schooling from Chennai and did his pre-degree from Mumbai. His passion for numbers led him to accounts thus he went ahead to pursue his B. Com in commerce. He had a choice to make between CA and MBA and he choose the latter and got into IIM Ahmedabad, where he recalls having spent the best part of his life. Talking about his childhood, he fondly spoke about his parents who encouraged him towards his passion for reading.

Fresh out of college he landed up at GESCO as a management trainee in 1990; In a funny conversation about why he chose GESCO in the first place, he says as the saying goes “Behind every successful man there is a woman” that woman turned out to be his wife whom he met during his IIM days leading him to GESCO. Talking about working in the same company for the past 32 years, he remembers how it was difficult to understand this unique industry in the first place and explain to the non-mariners what exactly is that we do, following his passion for numbers as well as dealing with clients in the stock exchange with the rates going up and down, made him very happy and he loves the choices he has made.

When it comes to what the CFO of GESCO likes to do in his free time, he talks about running half marathons up until 4-5 years ago. The only regret that he feels is that he did not sail on board to understand more of what life on the sea is like, which he says would have helped him to make more changes in the company.

A few words for the cadets, he says “the company is controlled by the people on ships, they are the people ensuring that services are being delivered to the customer safely and effectively.” A moment of inattention to the task at hand can have huge consequences for the company. The goal is to inculcate the culture of longevity within everyone on board.

- Editorial Team





**Mr Salil Raghavan**  
Head - HR

Mr Salil Raghavan, Head – of HR at The Great Eastern Shipping Company Ltd, was born and brought up in the cultural capital of Kerala, Thrissur. He did his schooling in Thrissur where his mother was a teacher. She kept a strict check on his activities during his childhood.

As a kid, he dreamt of playing cricket for India. But he could not continue his passion, though selected for the school team as his mother believed in education over sports. He recalls a funny moment when his mother regretted not letting him play cricket, when he lost out on 10% grace marks in final exams for sports.

He pursued his degree in Bachelor of Technology in Industrial Engineering, from Trivandrum, he laughs saying he was desperate to be independent as any teenager. Later he was equally desperate to get back home. Speaking of his engineering college days, he calls it a disaster. He was drawn more toward extracurricular activities than academics.

He was a part of various things such as college magazine, student politics, and strikes, and joined the Students Federation of India. He was nominated as hostel union secretary. With everything happening around him, he just could not truly focus on academics. Later, he pursued MBA at XLRI, Jamshedpur.

He recalls it to be a refreshing change. He looks back at those 2 years as the highlights of his life and also academically fulfilling. He played for his college cricket team. He says most events in his life were wonderful accidents, even GESCO. He had moved nearly 4 companies in the initial 13 years of his career till he found his true place in GESCO. He is here since the last 17 years.

When talking about what his expectations with cadets are, he says one must have the inquisitiveness to learn and be focused, adapt and become competent to run things.

This is the profession where people get the opportunity to take up responsibility at a very young age, so the person has to adapt to the environment and change. His message to all the cadets is “Be result oriented for yourself as well as the company.”

- Editorial Team

**SAGAR SAMMAN AWARD FOR THE BEST MARITIME TRAINING INSTITUTE**



Mr David Birwadkar Head Of The Institute receiving the award from Honorable Cabinet Minister Sarbanada Sonowal Ji, (Ministry of Ports, Shipping and Waterways)

**SOUND TRAVELS**

The speed of sound in water is 1,435 m/sec – nearly five times faster than the speed of sound in air. That is faster than a fighter jet.

**LIFE NEEDS THE OCEAN**

The oceans provide 99% of the living space on the planet containing 50-80% of all life. Wow, that is a lot of life living under the water! Think of how important the ocean is to our world.

**THE OCEAN IS HEAVY**

The pressure at the deepest point in the ocean is more than 11,318 tons/sq m, or the equivalent of one person trying to support 50 jumbo jets.

**GIANT PACIFIC OCTOPUSES ARE REALLY BIG**

The Pacific Octopus can squeeze through a hole the size of a quarter and has no bones?! Another fun thing about octopuses is that they are really smart and very inquisitive.

**FISH ARE FAST**

Swordfish and Marlin are the fastest fish in the ocean reaching speeds up to 75 mph in quick bursts; Bluefin Tuna may reach sustained speeds up to 56 mph.

**THE OCEAN IS OLD**

Scientists say life began in the ocean 3.1 billion to 3.4 billion years ago. Land dwellers appeared approximately 400 million years ago, relatively recently in geologic time.

**WHALES ARE HUGE**

Blue whales are the largest animals on our planet ever (exceeding the size of the greatest known dinosaurs) and have hearts the size of small cars!

**VOLCANOES ARE PART OF LIFE IN THE OCEAN**

Thousands of volcanoes live under the ocean. What's interesting about this is you might think they would heat up the oceans and destroy marine life. However, that isn't true and in fact, volcanoes play an important part in the biology of the ocean.

**WE LOVE OUR SEA TURTLES**

Six kinds of turtles found in U.S. waters - green, hawksbill, Kemp's ridley, leatherback, loggerhead, and olive ridley are protected by the Endangered Species Act. It is also common for some of these sea turtles to arrive each year on the shores of Topsail Island as they have been doing for thousands of years.

**WOW THAT IS DEEP**

The average depth of the Atlantic Ocean, with its adjacent seas, is 3,332 m; without them, it is 3,926 m. The greatest depth, 8,381 m, is in the Puerto Rico Trench.

**LOBSTERS ARE WEIRD**

Lobsters communicate by peeing at each other. They have urine nozzles just under their eyes and they disseminate pheromones by peeing in the direction of other lobsters.

**THE OCEAN IS FULL OF LIFE**

Currently, scientists have named and successfully classified around 1.5 million species. It is estimated that there are as little as 2 million to as many as 50 million more species that have not yet been found and/or have been incorrectly classified.

**OARFISH ARE REALLY COOL**

Oarfish (*Regalecus glesne*), is the longest bony fish in the world. They have a snakelike body sporting a magnificent redfin and can grow up to 17 m in length! They have a distinctive horse-like face and bluegills and are thought to account for many sea-serpent sightings.

**SHARKS HAVE A CAFE**

It turns out, that humans aren't the only creatures in need of a winter vacation. In 2002, scientists discovered an area in a remote part of the Pacific Ocean, partway between Baja, California, and Hawaii, where coastal great white sharks will migrate in the winter. The scientists named the spot the White Shark Cafe and some sharks hang around the area for months before heading back to the coast for warmer weather.

**THAT'S A LOT OF FISH**

There are over 30,000 known species of fish? Now that is a lot of fish! Many of those fish call the shore of Topsail Island home, making Topsail Island one of the best places on the east coast to fish.







# CREDITS

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**75**  
आजादी का  
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