AmbujaNeotia
THE NEOTIA UNIVERSITY
ज्ञानम् आत्म प्रदीपाय
Approved Under Sec.2(f) of UGC Act 1956

SOMS

ABHIJAN

ACADEMIC AND CAMPUS DIARY

MARINE INDUSTRY INNOVATION

VOL.-4, ISSUE-1
MARCH 2026
WWW.TNU.IN

SAIL BEYOND THE HORIZON OF THE ORDINARY,

WHERE WAVES WHISPER SECRETS OF THE DEEP.

LET EVERY TIDE TURN A PAGE OF DISCOVERY,

AND EVERY BREEZE CARRY STORIES UNTOLD.

DIVE IN—YOUR VOYAGE THROUGH KNOWLEDGE BEGINS HERE.

Foreword from the VICE CHANCELLOR

It is a pleasure to share a few words for ABHIJAN, the E-Magazine of the School of Maritime Studies at The Neotia University. This publication reflects the intellectual curiosity, creativity, and professional aspirations of our students and faculties engaged in the dynamic field of marine and maritime science.

The maritime sector remains the backbone of global trade. Today, over 80% of global trade by volume is transported by sea, making maritime transport the most efficient and cost-effective mode of moving goods across continents. Recognizing the importance of operational excellence and sustainability, the International Maritime Organization has adopted the theme "From Policy to Practice: Powering Maritime Excellence" for World Maritime Day 2026–2027, highlighting the need to translate global maritime policies into effective actions.

For India, a nation with a coastline of over 7,500 km and more than 200 ports, the maritime sector is vital for economic growth. Nearly 95% of India's trade by volume and about 70% by value moves through maritime routes.

In this changing landscape, the role of universities is also evolving. Institutions must go beyond traditional teaching to become centres of innovation, interdisciplinary research, and strong industry collaboration. The nation expects future marine engineers not only to operate vessels but also to design greener propulsion systems, develop intelligent maritime technologies, and contribute to sustainable ocean management.

I congratulate the faculties, students of the School of Maritime Studies for bringing out this issue of ABHIJAN. I hope this magazine will inspire young minds to explore new ideas and contribute to the advancement of maritime science, technology, and responsible ocean stewardship.

Prof. Arunansu Haldar
Vice Chancellor
The Neotia University

From the HOD

MARINE ENGINEERING

The maritime sector is currently undergoing a dual transformation, propelled by the urgent mandates of decarbonization and digitalization. As we move through 2026, innovation is no longer a peripheral pursuit but the core engine of industry resilience and regulatory compliance.

The "Smart Ship" is now a data-driven reality. The integration of AI-powered predictive maintenance and Low Earth Orbit (LEO) satellite connectivity has transformed vessels into floating IoT hubs. These systems allow shore-based teams to monitor engine health in real-time, preventing costly breakdowns and optimizing routes to reduce carbon intensity. Furthermore, the rise of Digital Twins—virtual replicas of physical vessels—enables operators to simulate and refine performance before a single knot is sailed.

As the Innovation in the marine industry is increasingly driven by the need for decarbonization and environmental compliance, our cadets at TNU train in a green campus—surrounded by solar energy systems, waste-to-resource conversion units, and water recycling plants—they internalize sustainability as a default operational principle. This mindset prepares them to design and manage vessels and ports that prioritize energy efficiency and reduced emissions.

Ultimately, innovation is the sector's primary tool for meeting the IMO's goal of a 40% reduction in carbon intensity by 2030, ensuring that global trade remains both efficient and ecologically responsible

Mr. Sanjay Kumar Das
HOD Marine Engineering, SOMS
The Neotia University

From the HOD
NAUTICAL SCIENCE

In this year 2026 we had the privilege of welcoming Major Anutosh Singh ADG from Mumbai to our esteemed University .

It gives me immense pleasure to present this edition of our School of Maritime Science Magazine, a platform that reflects the spirit of exploration, discipline, and innovation that defines our maritime community. Nautical Science and Marine Engineering is not merely a field of study—it is a way of life that demands precision, resilience, and an unwavering commitment to safety and sustainability at sea.

In these pages, you will find a blend of technical insights, research updates, and creative expressions from our students and faculty.

Each contribution is a testament to the curiosity and dedication that drive our department forward. As the maritime industry embraces new technologies and responds to global challenges, our role as educators and learners becomes ever more critical.

I extend my heartfelt appreciation to the editorial team, contributors, and readers who have made this publication possible.

May this magazine inspire you to think deeply, act responsibly, and sail confidently into the future.
Fair winds and following seas.

Capt. Diptesh Bhattacharya
HOD Nautical Science, SOMS
The Neotia University

From the EDITOR

We at the SOMS are delighted to present this volume of Abhijan. The theme in this volume hinges on different aspects of maritime innovations. Our cadets have succinctly discussed on possibilities of adoption of nuclear propulsion for cargo ships, on the optimization of energy systems onboard ships, on the evolution of maritime safety and security and on the modernization of marine control systems. Our young cadets have taken note of the adoption of modern technology in shipping and that Artificial Intelligence today is the backbone of modern technological progress as AI supports predictive maintenance, a more advanced and data-driven activity with the help of sensors, and machine learning to monitor equipment in real time, thereby ensuring that complex machinery like the large ocean-going ship operates efficiently and safely.

It is greatly encouraging to see that our cadets are also taking active interest in art and literature. Their creditable efforts are presented here.

As we present this volume of Abhijan by our future seafarers, we cannot forget that the world has recently been gripped by escalating violence and wars. Peace has been repeatedly shattered. The geopolitical conflicts have been disrupting key shipping routes. Many parts of the world suffer from the lack of essential supplies while the ships and their crew are coming under the direct line of fire with loss of seafarer lives and considerable damage to ships and the environment. The United Nations has declared “Peace, Justice and Strong Institutions” as Sustainable Development Goal 16. Achieving this goal requires recognizing that many conflicts arise from disrespect for differences and the tendency to look down upon others. We can only pray that good sense prevails amongst the leaders of the nations and we may sail into calmer seas.

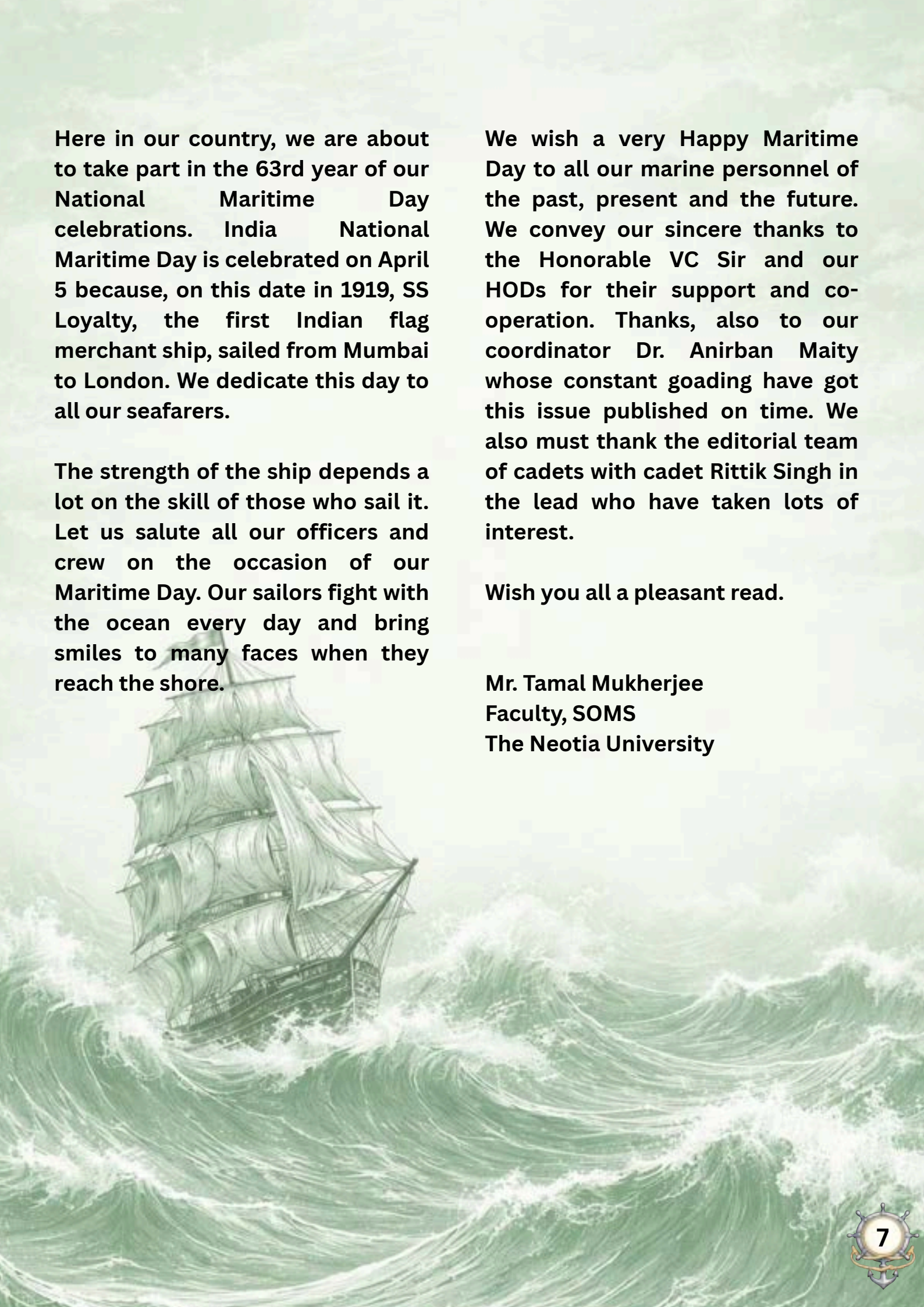
Here in our country, we are about to take part in the 63rd year of our National Maritime Day celebrations. India National Maritime Day is celebrated on April 5 because, on this date in 1919, SS Loyalty, the first Indian flag merchant ship, sailed from Mumbai to London. We dedicate this day to all our seafarers.

The strength of the ship depends a lot on the skill of those who sail it. Let us salute all our officers and crew on the occasion of our Maritime Day. Our sailors fight with the ocean every day and bring smiles to many faces when they reach the shore.

We wish a very Happy Maritime Day to all our marine personnel of the past, present and the future. We convey our sincere thanks to the Honorable VC Sir and our HODs for their support and co-operation. Thanks, also to our coordinator Dr. Anirban Maity whose constant goading have got this issue published on time. We also must thank the editorial team of cadets with cadet Rittik Singh in the lead who have taken lots of interest.

Wish you all a pleasant read.

Mr. Tamal Mukherjee
Faculty, SOMS
The Neotia University



From Extra First Class to DOCTORATE

Since 2017, I believed I had reached the highest level of engineering competence when I obtained the Extra First Class certification. At that stage, it felt like reaching the summit of a long and demanding professional journey I had once set for myself as a marine engineer. The certificate number 95XW-0015 was not just a code; it was a symbol of years of preparation, sea experience, technical examination, and mental endurance. At that time, my thinking was shaped completely by practice, solving real problems, machinery breakdowns, fuel issues, performance loss, compliance challenges. Decisions had to be quick. Solutions had to work.

The thought of pursuing a Doctorate came much later.....

During my teaching career, I gradually realised that knowing how a system works is very different from understanding why it behaves the way it does. It revealed that while I had learned to operate and manage systems effectively, I had not yet explored them at a deeper investigative level.This realisation evolved over time through rejected research articles, revised models, experimental setbacks, reviewer comments, and long hours of analysis. Research demanded humility. It made me accept that practical experience, however rich, cannot replace systematic investigation. At the same time, my Extra First Class background became my strength.

Receiving the doctoral degree recently felt different from achieving a professional certification earlier in life. Extra First Class gave me professional confidence. The Doctorate gave me intellectual patience. One strengthened the ability to act; the other strengthened the ability to think. Professional experience shaped the questions I asked; research helped me search for structured answers.

For students and young marine engineers, my message is simple: do not see professional excellence and academic research as opposing choices.

Dr. Atanu Roy
Faculty, SOMS
The Neotia University

From the COORDINATOR

I am pleased to present Abhijan, Vol-IV, Issue-I, based on the theme "Marine Industry Innovation." The maritime sector continues to evolve with steady advancements in technology, sustainability practices, and operational efficiency. From cleaner propulsion systems to digital navigation and smart port management, innovation is shaping the direction of modern marine industries.

This issue brings together thoughtful contributions that reflect both technical understanding and genuine interest in the changing landscape of the maritime world. The articles highlight emerging ideas while also encouraging responsible and sustainable growth.

I sincerely express my gratitude to our Editor, Prof. Tamal Mukherjee, for his guidance and constant support in shaping this volume. I also extend my special thanks to Dr. Manashi Chakraborty for her valuable assistance in refining the English language of the articles. My appreciation goes to all faculty members and contributors who have worked with dedication to make this issue possible.

Our students, as always, remain the heart of Abhijan. Their enthusiasm, creativity, and commitment continue to strengthen this platform.

I hope this edition inspires fresh thinking and responsible innovation in the marine sector.

Happy reading!
Dr. Anirban Maity
Coordinator, Abhijan
Vol-IV, Issue-I (March 2026)

the EDITORS

RITTIK SINGH
MRE 3RD YEAR

ARIJIT GHOSH
BNS 2ND YEAR

Table of Contents


TECHNICAL
papers

NUCLEAR POWER POSSIBILITIES AND IMMEDIATE FEASIBILITY MEASURES FOR WIDE ADOPTION IN CARGO SHIP OPERATION

~Cdt Somali Munshi
~Cdt Rittik Singh
(MRE, 3rd Year)

INTRODUCTION

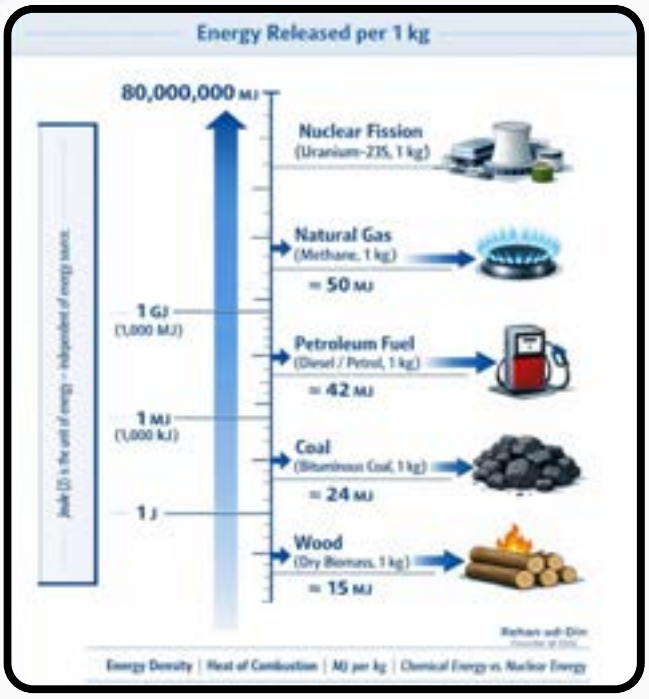
The world is relying on the shipping industry for their major advantages as it can transport the cargos very easily. Rather it is producing CO2 and GHGs. Therefore, a new possible direction of ocean shipping in the future is, nuclear merchant propulsion that would reduce air emissions and/or could offer faster ocean freight to some high-value cargoes.

Nuclear marine propulsion is propulsion of a ship or submarine with heat provided by a nuclear reactor. The power plant heats water to produce steam for a turbine used to turn the ship's propeller through a gearbox or through an electric generator and motor. Nuclear propulsion is used primarily within naval warships such as nuclear submarines and supercarriers. Compared to oil- or coal-fuelled ships, nuclear propulsion offers the advantage of very long intervals of operation before refuelling. All the fuel is contained within the nuclear reactor, so no cargo or supplies space is taken up by fuel, nor is space taken up by exhaust stacks or combustion air intakes.

WHY SWITCHING TO NUCLEAR PROPULSION.

THE URGENT NEED FOR DECARBONISATION IN MARITIME SHIPPING

During the quest to decarbonize shipping, several sources of renewable energy have been looked upon as the propulsion systems, which included wind power, solar energy power, biofuels, green ammonia and hydrogen. Despite the above advantages, it must be noted that all these technologies have significant drawbacks in terms of flexibility and readiness to be installed. The use of nuclear energy in a commercial ship is disregarded both socially and politically, yet this also presents a chance to consider the issues in an entirely new way.



Energy Density Comparison

WORKING OF NUCLEAR PROPULSION

Nuclear propulsion is given in ships where the heat generated in the process of nuclear fission is used to produce steam which in turn drives turbines to create propulsion. This is like a steam power plant except that the source of heat is a nuclear reactor rather than a fuel burning boiler.

1.Nuclear Reactor (Heat Generation)

- The vessel has a nuclear reactor, typically fuelled with uranium.
- Nuclear fission takes place in the reactor, where atoms of uranium absorb neutrons and break apart.
- These disintegrations emit a high amount of heat energy.

2. Coolant System

- Heat generated in the reactor is removed by a coolant (most of the time pressurized water).
- This hot coolant passes through a heat exchanger or steam generator.

3. Steam Generation

- In the steam generator, high pressure steam is generated by cooling the heat of the coolant on water. The steam resembles what is generated by the traditional marine boilers.

4. Turbine Operation

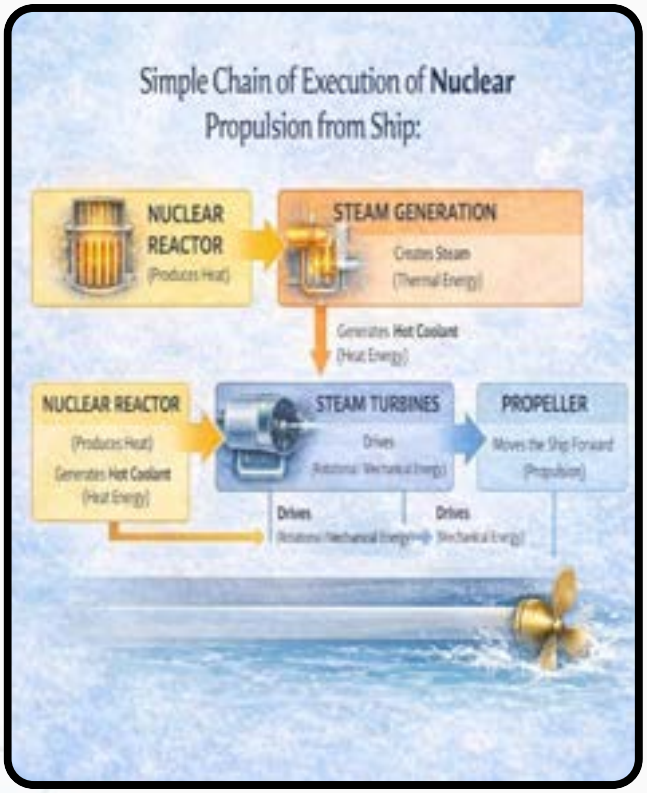
- The steam under high pressure is forced onto steam turbines.
- Through the steam turbine, steam thermal power is converted into mechanical rotational power.

5. Propeller Rotation

- The turbine is attached to the propeller shaft by reduction gears.
- When the turbine is in rotation, it rotates the propellor, which propels the water against and pushes the ship forward.

6. Condensation and Recirculation.

- Once the turbine has been passed, the steam is then sent to a condenser where it is cooled and returned into water.
- The water then is pumped back to the steam generator where the process repeats.



WHY NUCLEAR? EXPLORING THE BENEFITS FOR MARINE PROPULSION

The benefits associated with nuclear power to cargo ships are unmatched. Compared to the normal fuel propulsion, nuclear propulsion has some major benefits especially in the case of the long-haul sea vessels. Nuclear propulsion serves to address the high environmental standards in the market since it has zero air emissions when in operation, and thus is an appealing alternative in marine pollution minimization. Moreover, it offers steady power supply at high speeds and range, which are suitable to challenging conditions in submarines and aircraft carriers. Its advantages surpass traditional fuel propulsion. Some key advantages are as follows: -

- Zero Emissions: Removes emissions of greenhouse gases and pollutants in the operational processes, which can greatly enhance the quality of the air.
- Long-range: Nuclear reactors do not need refuelling after several years and this enables them to travel longer distances and lessen the number of port calls.
- Improved Power: Delivers steady and high power, which is suitable where large ships need a high propulsion force.
- Buyer power: Stabilizes fuel costs: less susceptible to fluctuating fuel prices of fossil fuels, which provide a higher degree of predictability in its operations.
- Space Efficiency: New designs of reactors are becoming smaller and more cargo efficient.

- Greater Safety: Safety measures and reactor designs are honed to perfection over decades of Naval experience.

POTENTIAL RISKS AND CHALLENGES

Commercial shipping nuclear propulsion has a number of significant challenges. The former is the political and legislative limitations because a lot of coastal and port states fear that nuclear-powered vessels are a threat to their safety and the environment. The inability to coordinate the activities of such organizations as the International Maritime Organization (IMO) and the International Atomic Energy Agency (IAEA) may also cause conflicts with the law and difficulties in operations.

1. Safety Risks

- The most significant issue of nuclear propulsion is the safety of the reactor.
- Unintentional breach of radiations because of the failure or destruction of the reactor.
- Nuclear meltdown in extreme failure conditions.
- The risk of radiations getting to the crew members and nearby populations.
- Radioactive materials may pollute the ocean in case of collisions, grounding or sinking.

2. Environmental Concerns

Even though nuclear propulsion does not release any CO 2 when it is used, it remains hazardous to the environment.

- Radioactive wastes disposal of the reactor.
- Marine pollution that would happen in case of the leakage of radioactive material into seawater.
- Heat pollution due to release of hot cooling water.

3. High Initial Cost

Merchant ships built with nuclear power are extremely expensive to build.

- Nuclear reactors and shielding systems are highly costly.
- Shipyards require special construction plants.
- Costs are raised due to insurance and regulatory compliance.

4. Regulatory and Legal Issues

The nuclear vessels are not well-known in international shipping regulations.

- Close regulations by organizations such as International Maritime Organization.

- Nuclear-powered ships are refused entry into ports by many countries.
- The requirements concerning licensing and inspections are very strict.

5. Security Risks

There are security threats that nuclear propulsion presents.

- Possibility of theft of nuclear material.
- Possible terrorist or weapon use of radioactive material.
- Strict international protection and supervision is required.

6. Crew Training and Expertise

A nuclear reactor needs well trained staff members.

- Crew needs to be knowledgeable in nuclear engineering.
- A continuous training and certification must be done.
- Lack of nuclear marine engineers.

7. Decommissioning and Waste Disposal.

When the life of a ship comes to an end then the reactor should be removed.

- Storing and disposal of the nuclear waste.
- Radioactive materials are safely disposed.
- Storage and monitoring cost in the long run

Lastly, financial risks are also high because of high cost of construction, low insurance cover, and inability to attract the interest of the private investment. It is therefore the duty of governments to facilitate international control, openness, vigilance, and cooperation to control these risks and make nuclear propulsion in shipping more acceptable all over the world.

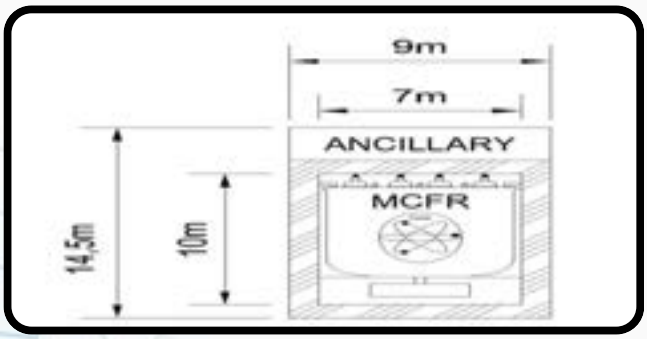
IMPLEMENTATION OF NUCLEAR PROPULSION

1. Chosen Reactor

One concept ship which was designed with Core Power is Molten Chloride Fast Reactor (MCFR), a form

of molten salt reactor in which molten salt is both fuel and coolant. The reactor employs High Assay Low Enriched Uranium (HALEU) containing 1619.75per cent of enriched Uranium to enable the production of energy and breeding of more fuel.

Fission reactions provide heat to maintain the molten salt (sodium chloride) above 400 o C. Addition of fuel can be done slowly during the operation of the reactor, that is, the ship does not require halting to be refueled. The mass of the reactor is approximately 2000 tons, shielding is provided, and at the tank top is the protective buffer space. This heat is used to produce electricity that is used in ship operations.



Main Dimensions of the Chosen Reactor

2. Systems Compatibility with Ship Systems

The nuclear reactor is linked to supercritical CO2 (sCO2) that operates propulsion and auxiliary generators. Cooling turbine halls have weights of about 80 tonnes each and turbines of around 18 tonnes. Infrastructure Port infrastructure might have a problem in terms of nuclear maintenance and CO 2 supply. Turbine-connected generators are about 40-tonne, which is heavier than in the reference ship.

SCO2 Turbomachine

3. Electricity Production

The 48,000-kW output of the reference ship is produced via 3 sCO2 turbine systems with each having an output of about 16,000 kW. Redundancy of independent power conversion system is safe and an auxiliary power source is suggested in case of reactor malfunctioning. The molten salt reactor produces heat that is used to power the sCO2 turbines, and efficiency is enhanced by

recuperators and the supercritical conditions are ensured by compressors. Two sCO2 systems serve propulsion through the use of a single switchboard with the third serving hotel and auxiliary loads with backup diesel engines.

4. Space Requirements

Another important factor that should be taken into account when using nuclear propulsion in passenger vessels is the area occupied by the reactor and related apparatus. Layout systems involved in the layout are sCO2 turbines and cooling, CO2 supply, gas heaters, backup generators and ancillary equipment. The comparison with a reference vessel illustrates the way the spaces should be restructured to accommodate the nuclear systems, and the proposed relocations are outlined to optimize in the future designs.

CURRENT NUCLEAR MARINE PROPULSION

Nuclear propulsion is not a novel idea in the field of maritime. The deployment of nuclear-powered vessels by the naval fleets all over the world has been successful over the decades, which has given a rich source of data on operations and safety experience.

1) USS Enterprise (CVN-65)
- The world's first nuclear-powered carrier.
- The United States Navy operates it.
- It had eight nuclear reactors that were used to supply power to the ship and its systems.
- Was able to work over long distances without refueling.

2) USS Nautilus (SSN-571)
- In 1954,the first nuclear submarine was released.
- Depicted the merits of nuclear propulsion which included long range and high speed in underwater.
- Notorious first expedition across the ice of the North Pole.

3) Arktika (Project 22220)
- A new icebreaker with Russian nuclear power.
- Operated by Rosatom.
- Intended to fight through dense Arctic ice and aid the shipping routes in the Arctic.

4) NS Savannah
- One of the earliest nuclear merchant vessels.
- The United States constructed it as a show project.
- Achieved demonstration of nuclear propulsion in commercial shipping.

CONCLUSION

Nuclear propulsion can transform the future of ships transportation by offering a high-powered and low-carbon propulsion alternative to the traditional fossil fuel-powered propulsion. The fact that it is capable of generating substantial levels of energy with zero operational greenhouse gas emissions makes it a viable option towards meeting the long term decarbonization target of international bodies like the international maritime organization. Cargo ships that run on nuclear energy would need less fuel since they could travel long distances without fueling, enhance energy security, and they would not rely on the supply chain of fuel that is distributed throughout the world. Nonetheless, there are a number of challenges that have to be overcome before it can be adopted on a large scale. High cost of construction, strict international regulations, waste management, and requirement of highly trained crew members are still the major hindrances. As technology keeps improving, better designs of reactors are developed, and extensive cooperation among countries in regulation and safety standards, nuclear propulsion has become a valid and sustainable option in the future operation of commercial shipping business.

REFERENCE

- Hagen, M. J. (2022). Feasibility Analysis for a Nuclear-Powered Commercial Merchant Ship (Doctoral dissertation, Massachusetts Institute of Technology).
- Carlton, J., Smart, R., & Jenkins, V. (2010). The nuclear propulsion of merchant ships: aspects of risk and regulation. In Lloyd's Register Technology Days 2010.
- Wulff, L. (2023). Feasibility of the implementation of nuclear reactors as main energy source in passenger vessels.
- Metaxinou, P. S. (2025). Employment of nuclear power in shipping: a multidimensional assessment of environmental, economic, safety and social implications (Master's thesis, Πανεπιστήμιο Πειραιώς).
- Kramer, A. W. (1962). Nuclear propulsion for merchant ships. US Atomic Energy Commission.

THE OPTIMIZATION OF THE SHIP ENERGY SYSTEM

~Cdt Mainak Mondal
(MRE, 2nd Year)

INTRODUCTION

Ship energy-system optimization is an interdisciplinary endeavor to minimize fuel consumption, emissions, and the lifecycle cost through integrating system synthesis, system control, and operational schedule; model-based design, multi-objective optimization, and decarbonization are the prevailing forces of the arena as indicated by recent reviews. A clever combination of engines, thrusters, batteries, and even new fuels such as hydrogen or methanol can reduce fuel consumption, decrease pollution and save money, which engineers can do. As global regulations on emissions get tougher and fuel prices increase, optimization implies selecting an appropriate system design, properly sizing the parts and scheduling the use of energy on a specific journey. The latest technology such as computer models and intelligent control systems assists ships to exchange loads without problems, utilize batteries in a sensible way, and maintain high performance with at the same time remaining environmentally friendly.

AZIMUTH THRUSTER

The Azimuth thrusters have increased efficiency in the energy

production of the ship as it can be steered 360 degrees, which lowers hydrodynamic losses and enhances maneuverability. Since the motor-drive system will only use power when the thruster is actively rotated, vessels will not waste energy by using it, and thus less fuel will be used, and emissions will be reduced. Electric azimuth thrusters, which are

gaining more and more popularity in ferries and offshore ships, are also compatible with flexible generator configurations and allow load sharing to be optimized and propulsion control to be smoother. One practical example Maersk takes the systems of hybrid batteries and fits them on the azimuth propellers of its offshore vessels, which lowers fuel consumption during dynamic positioning operations.

Future Initiatives

Based on the future, electrification, hybridization, and compact high-thrust are imminent activities. New series of electric azimuth thrusters to meet the urban ferry markets, with a focus on increased energy efficiency, and simpler integration with the hybrid power plants, are recent developments. There is also development of digital control systems, which permit real-time thrust optimization, predictive maintenance and improved load management in combination with either a battery or alternate-fuel generators. These developments are consistent with the wider trends in the maritime industry.

COMBINED DIESEL AND GAS (CODAG) SYSTEM

A CODAG system (Combined Diesel and Gas) is an enhancement of a ship that is already efficient in energy consumption by allowing each engine to work in conditions in which it is most efficient. The ship is

propelled by the diesel engines when running at normal speed, as they consume a lot of fuel. The gas turbine is used to supplement the ship when it requires more speed or acceleration. The alternation between these two sources of power or their combination when required enables the ship not to spend fuel in vain, and preserve its high performance.

An actual instance is the Sachsen-class Frigates of the German Navy, which also apply the CODAG designation to operate effectively on diesel power, and then transition to gas turbines when they have to move at high speeds The second example is the Turkish MILGEM Ada-class corvettes, which use CODAG to balance fuel economy and high response time.

Future Initiatives:

The future trends are to make CODAG systems greener, smarter and environmentally friendly. Engineers are in the process of incorporating hybrid-electric systems, advancing digital control systems that automatically regulate the use of energy, and modifying CODAG configurations to operate. Research is also being done on more efficient gear systems. These projects also help fight emissions in the world and help the ships to transition to a new technology of propulsion that is more environmentally friendly.

DUAL FUEL SYSTEM

Dual-fuel propulsion provides a performance increase in the use of energy by the ship by enabling the engines to run on both traditional marine fuels (HFO) and cleaner fuels like LNG or methanol. This flexibility allows the engineers to choose the most efficient fuel and cost-effective with regard to voyage conditions, fuel prices and emissions requirements. The solution enhances thermal efficiency and carbon intensity, and helps to address the increasing IMO energy-efficiency regulations. The methanol-ready dual-fuel feeder ship of X-Press Feeders called Eco Maestro was custom-built in 2024 and will operate in Asia and Europe, which is an indication that dual-fuel flexibility can directly ease the optimization of energy and reduce emissions.

Future Initiatives:

The prospective advances center on the implementation of dual fuel systems in decarbonization processes at large. The major programs are the optimization of the fuel selection within the regulatory foundation (Fuel EU Maritime) and the broadening of the next-generation fuel use (green methanol, ammonia, hydrogen) and the complement of the dual-fuel engine by the hybrid system (battery, renewable-assisted propulsion, etc.). The Classification

Societies are also giving updated technical advice to the newbuilds to counsel the shipowners on the safety and fuel-handling systems, in addition to the long-term compliance planning.

Real-life example: Major shipyards and engineers are already ordering on an unprecedented scale in methanol- and LNG-compatible container ships, and more than 50 %of the newbuild tonnage in alternative fuels in 2024 will be in the form of dual-fuel box ships. This rush, inspired by EU/IMO decarbonization regulations, demonstrates that the future fleet is being built with dual-fuel engines in mind, being hybridized and next-generation fuel-powered.

H2 FUEL CELL SYSTEM

Hydrogen fuel cells are today being fitted into contemporary vessels in order to reduce energy consumption and cut on emissions. With hydrogen generating electricity directly into the power output through an electrochemical reaction, the fuel cells provide high efficiency, steady power at the expense of a by-product, that is, water vapor, and this makes them the best source of power in hybrid propulsion systems. In India, Cochin Shipyard Ltd is designing the 50-passenger green hydrogen fuel-cell ferry locally, and has already passed through trials and is undergoing service in Varanasi on the Ganga.

Future Initiatives:

The second-generation activity that will follow is to increase the application of hydrogen fuel cells to more than pilot ships to the standard maritime industry. Other projects like the “Hyflex shore generator of Hitachi Energy” are coming up with clean shore-side solutions to reduce emissions during the berthed period of ships. Europe, Japan and North America are developing hydrogen ferries and cargo vessels, and bunkering infrastructure, and India intends to increase hydrogen infiltration into its fleet.

CONCLUSION

Ship energy-system optimization refers to the selection and control process of the ship's engines, thrusters, batteries and fuels in such a way that the ship burns less fuel, pollutes less and also costs less throughout its life. The engineers rely on computerized models and intelligent controls to determine the most suitable composition of equipment, appropriate sizes and the timing of the operation of every segment in a journey. This assists in the even distribution of power, wise use of batteries and the conversion to cleaner energy sources such as hydrogen or methanol were convenient. Tighter emissions regulations and rising gasoline costs result in money saved, compliance with the rules, and a reduction of greenhouse gases through optimization. It requires teamwork in designing, operating, and controlling systems.

REFERENCE

- Tadros, M., Ventura, M., & Guedes Soares, C. (2023). Review of the IMO initiatives for ship energy efficiency and their implications. Journal of Marine Science and Application, 22(4), 662-680.
- Desai-Patil, V., Ayare, A., Mahajan, B., & Bade, S. (2015). A review of the azimuth thruster. Int. J. Mech. Eng, 2, 38-41.
- Wang, C., Peng, Z., Yang, J., Zhang, N., Li, K., & Li, X. (2025). Optimal alternative fuel selection for dual-fuel ships under Fuel EU maritime regulations: environmental and economic assessment. Journal of Marine Science and Engineering, 13(6), 1105.
- Köhler, J. (2020). Zero carbon propulsion in shipping–scenarios for the development of hydrogen and wind technologies with the MATISSE-SHIP model. International Shipbuilding Progress, 67(1), 79-95.

ADVANCEMENT IN CONTROL SYSTEM

~Cdt Kingsuk Guchhait
~Cdt Sanjok Tamang
(MRE, 3rd Year)

INTRODUCTION

Control systems in ships are essential for efficient and safe operation ensuring safety, accuracy and stability for the machineries, crew and environment. Historically, maritime operations like maintaining vessels course, managing propulsion, balancing cargo and also complying with environmental regulations heavily relied on manual intervention, but technological advancements have introduced automation and digital integration. Cargo and merchant vessels, which account for the majority of global trade transport, have particularly benefited from these innovations.

FUNDAMENTALS OF CONTROL SYSTEM

- Open-loop systems
- Closed-loop systems

METHEDOLOGY

The information in this paper is on industry report information, maritime engineering standard information, and some of the new technological developments. The comparison is done between the traditional and modern control systems in merchant ships in terms of propulsion, navigation and cargo handling.

Marine control system is an evolutional system.

- Traditional Systems: These are the ones with manual steering systems, mechanical propulsion linkages and analogue gauges. Such systems were very operator intensive did not incorporate any feedback and could easily be inefficient and subject to human error.

- Modern Systems: These are characterized by the digital automation, centralized monitoring platforms, remote monitoring and troubleshooting. They apply closed loop feedback mechanism, sophisticated sensor networks and controlled units to realize greater accuracy, trustworthiness and working safety.

Expert Systems:Marine expert systems are customized AI applications focusing at replicating human expertise in marine-related areas.

The systems are made up of two components: a knowledge base that contains information specific to the domain and an interpretation engine that uses logical rules on this knowledge to resolve complicated issues. For example, in ship design, an expert system can assess different design parameters and constraints to suggest optimal configurations,

Thus improving efficiency and safety. Expert Systems have significantly increased the diagnostic and control capabilities of marine systems. These systems allow modular and open design which allows knowledge base from the rest of the control system.

Systems like CoCoS-EDS and FAKS2i demonstrate this method by keeping years of operational knowledge and utilizing rule-based algorithms to offer data-driven suggestions for fault detection and diagnostics (Coraddu et al., 2021). Figure 2-2 illustrates a general structure of the basic expert system. Consequently, figure 2-3 shows how an expert system would look like if it's integrated with a diagnosis system.

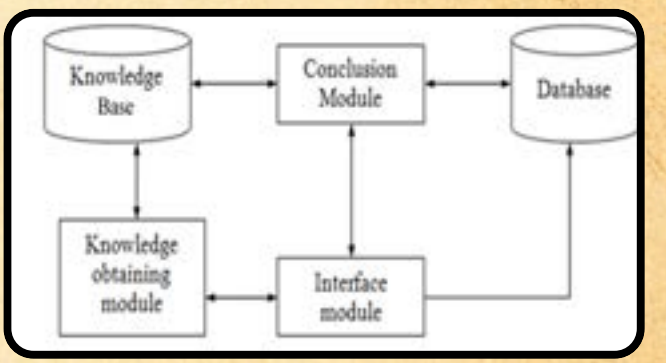


Fig: Basic structure of expert system (Charchalis & Pawletko, 2011)

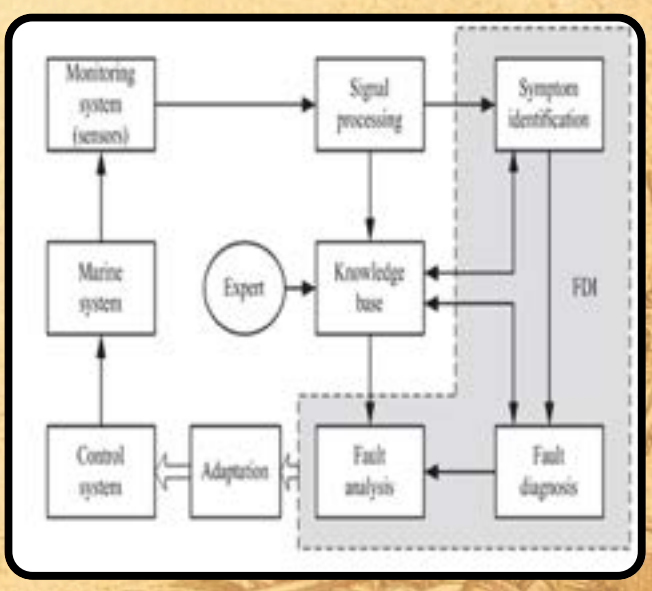
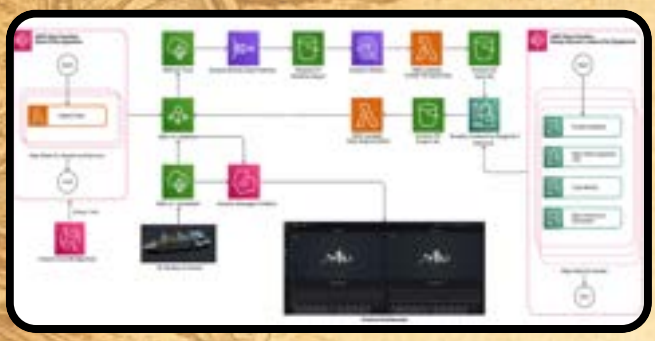


Fig: Expert knowledge-based control and diagnosis system (Antonić & Komar, 2007)

AI-Based Diagnostics and Predictive Maintenance: To improve operational productivity and safety traditional reactive methods have transformed to proactive methods by integrating artificial intelligence (AI) into marine engine control systems. Analysis of real-time data from engine sensors helps to determine potential faults early and prevent them from developing into major faults by using machine learning algorithms. An example could be seen from the collaboration between Magellan X and Neurons Lab; they have developed a solution for predictive maintenance by optimizing performances and energy efficiency. This project aims to gather real-time data from different equipment inside the ship and make a model that would be able to detect potential failure. This solution was primarily targeted to minimize downtimes of the system by analyzing each equipment data and eventually reducing maintenance cost. Machine learning algorithms can also be used in evaluating the performance of on-board systems including analysis of data of all devices onboard. Fault patterns were identified by analysing the sensor data onboard.

Sweater cooling system of an oil tanker has shown how this kind of approach could work. This specific AI-based model worked in a way that human intervention was possible at the right time to achieve operational reliability and model could detect abnormalities well before it occurred. This kind of approach is important to determine how long a system can run without major issues or any human intervention. An advanced AI-powered engine monitoring system has been deployed in Maersk Line vessels for development of a predictive maintenance models. This model gathers all real-time data from different types of engine sensors, such as temperature, pressure, and vibration measurements. Then the model generates a pattern which can suggest if there will be any equipment failures in coming time (Face, 2023). Eventually it allowed them to take decisions on maintenance schedules well before any actual failure happens.

These cases are few of those examples of having AI technologies into marine engine control systems in recent years



KEY ADVANCEMENT IN CONTROL SYSTEM

Ø Integrated Automatic Systems, also known as Integrated Platform Management Systems (IPMS), or Integrated Automation Systems (IAS), are a complex type of automation, intended to help bring together the control and monitoring of the vital systems of a ship. These systems are a combination of many subsystems which include propulsion, electrical power, auxiliary machinery, ballast, fuel management and damage control- all on to one platform. It can hence minimize the necessity of the manual input, enhance the coordination, as well as optimize the overall effectiveness of operations.

Artificial Intelligence in Control Systems This section is about the use of intelligence control systems as it applies to the marine engine control and in particular, energy management.

It will also discuss AI techniques such as fuzzy logic, neural networks and expert systems and comparison between conventional control systems and AI-based techniques in general areas in addition to the marine environment.

Propulsion Control: New digital control such as Auto Chief has high control of engines. They are able to automatically control engine load, start/stop cycles and enhance fuel efficiency. Hybrid propulsion engines are systems that integrate electricity motors with the conventional engines to reduce emissions and increase efficiency.

o Dynamic Positioning (DP): DP systems are in place with the use of GPS, compasses, and thrusters to maintain a ship at rest. They manipulate wind, currents and waves by processing real time sensor data.

o Human-Machine Interfaces (HMI): The current HMIs incorporate touchscreens and modular screens that are easy to use. They decrease the workload of the operators, enhance awareness of the ship conditions, and enable swift reaction in case of important operations.

Key Upcoming Advancements

Ø Autonomous & Semi-Autonomous Ships

o Cargo ships, ferries, and offshore ships are being tested with autonomous systems of navigation based on AI and advanced sensors.

o Firms such as Wartsila and Rolls-Royce are innovating intelligent bridge systems that will ease the workload on the crew and enhance the safety.

o The first to dominate will be semi-autonomous ships and remote monitoring centers will help in navigation.

Ø Smart Logistics & Block chain

o Cargo tracking based on block chain to enhance transparency and minimize fraud in worldwide shipping.

Ø Ships, ports, warehouses, and supply chains will be integrated with integrated control systems to have cohesive logistics.

BENEFITS

o Safety on operation: Automation will decrease the human input in operations and will minimize the possibility of human error and improve the reliability of navigation.

o Energy Efficiency: New propulsion and control algorithms are used to optimize engine load and fuel consumption and reduce the operating costs.

o Regulatory Compliance: In-built monitoring systems aid in the compliance with IMO emission and environmental standards.

o Crew Optimization: Computerized functionalities save the need of man power and do not affect operational performance.

CHALLENGES

o Cyber security Vulnerability: With the augmented digital connectivity vessels are exposed to cyber-attacks of critical control systems.

o Retrofitting Costs: To retrofit older vessels and offer them modern automation needs a lot of capital investment and system integration.

Adaptation of the Skills:

The crew members should undergo special training to be able to use and maintain more sophisticated control technologies.

CONCLUSION

The development of control systems has brought about the metamorphosis of cargo and merchant vessels into a very automated, efficient and environmentally compliant vessels. Although there are challenges like cyber security and the cost of integrating, the trend in the future seems in the direction of autonomous ships, cargo tracing through block chains, and green propulsion technologies. These inventions will keep transforming the shipping logistics and international trade.

REFERENCE

- CoCoS-EDS and FAKS2i
- Magellan X and Neurons Lab
- Ship And Mobile Offshore Unit Automation: A Practical Guide 1St Edition By Henryk Peplinski

MARITIME SAFETY AND SECURITY

~Cdt Sami Alam Siddiqui
~Cdt Shubham Bairagi
(BNS, 3rd Year)

INTRODUCTION

The maritime domain, covering over 70% of the Earth's surface, is vital for international trade, economic growth, and global security.

The importance of maritime safety and security cannot be overstated. With over 80% of global trade relying on maritime transport, ensuring the safe and secure passage of vessels is crucial for economies worldwide. Yet, the maritime domain remains vulnerable to various threats, underscoring the need for enhanced international cooperation and robust frameworks.
This paper will examine the existing regulatory frameworks, regional initiatives, and technological innovations aimed at bolstering maritime safety and security. It will also discuss the role of international organizations, such as the International Maritime Organization (IMO) and the United Nations Convention on the Law of the Sea (UNCLOS), in shaping global maritime governance.
Key areas of focus will include:
- Piracy and armed robbery
- Maritime terrorism and security threats
- Environmental degradation and pollution

OUR PAST INCLUDES:

1. International Convention for Safety of life at Sea (Solas 1974)
2. International Convention for Prevention of pollution from ships (MARPOL 73/78)
3. Maritime Labour Convention (MLC 2006)
4. Risk Assessment
5. Internation Ship & Port facility Security Code
(ISPS code)
6. Bridge Team & Resource Management
7. Bridge Navigation & Watch Alarm System
8. Classification survey and Flag / port state Inspections
9. International Safety Management Code.

NEW SAFETY INNOVATIONS IN 2025

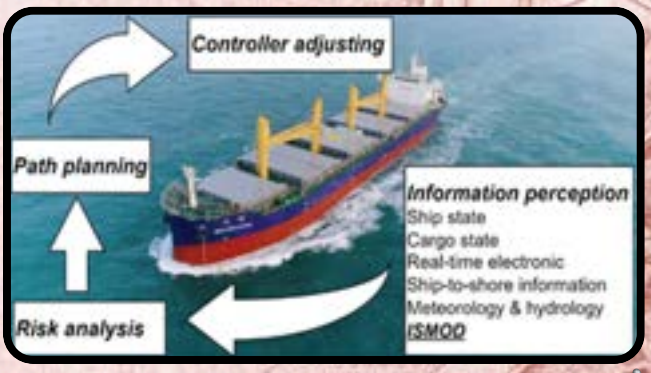
1) AI data-driven predictive maintenance:

Artificial intelligence and big data-driven predictive analytics are changing the process of ship maintenance and operation. Predictive systems are based on real-time data rather than reactive approach to monitor the important sectors of the vessel performance such as engines, fuel systems and other important machinery to detect abnormal behaviors at an early stage. This helps crews to perform specific maintenance on time and prevent sudden failures. Machine learning is also used to enhance safety across fleets by determining the reasons of safety concerns and the pattern of data. By 2025, an even wider usage of the maritime AI safety tools incorporating the IoT sensors should be anticipated to provide even more accurate ship predictive maintenance.

2)Intelligent Navigation:

Safe navigation is very essential in running a ship efficiently. Crews are today being enabled by advanced navigation systems to make safer and better-informed decisions, which are being empowered by artificial intelligence, computer vision, and machine learning. They utilize real-time data on real-time cameras and sensors on board to analyse and give information that assists in preventing collisions and improving the accuracy of navigation.

This decreases the human judgement factor alone, thereby minimising chances of making mistakes in navigation. As these systems continue to improve with the incorporation of satellite data to predict weather-related risk, it is expected that in 2025, autonomous shipping trials will become integrated with the systems.



3)Onboard maintenance and training

More shipping companies are adopting remote and robotic technology to minimize risk when conducting maintenance. Drones are also being employed in the inspection of external hulls, narrow crevices, and heights in order to achieve high-resolution images and this way, the dangers of working in high-risk conditions are eliminated. Automated tank cleaning systems are also contributing to less manual input on the ballast or fuel tanks which are normally hard and hazardous to get into. These tools are not only safety enhancers but also offer an environmental advantage i.e. emissions that are emitted by the traditional methods of inspection are minimized. The opportunity to superimpose the digital instructions on physical devices contributes to the precision of the results, in particular, when the work is with the unfamiliar equipment or in the case of the emergency.

4)Crew safety Wearable Technology.

Since life on a board may be a physically challenging experience, wearable technologies are being completed in an attempt to assist enable crew members to work in a safer and more efficient way. Exoskeleton is one such example that can be applied in relieving load on muscles and joints when performing heavy tasks, bending, and repetitive work. Exoskeletons are already being used in some shipyards in the maritime environment to assist the workers in handling loads up to 30kg without the risks of injury. The technology minimizes the physical load and exhaustion, enables an extended working time, and decreases the chances of getting injuries.

5)Safety responses powered by data.

Whenever there is an emergency every second counts. Conventional headcounts may be tedious and subject to inaccuracy, particularly under stressful circumstances. It is against this backdrop that digital tracking systems present a more viable means of knowing where the crew members are in real time on board. These systems provide real-time location awareness of the crews, enhancing the coordination of the crew whenever they are drilling or during an emergency such as fire outbreak or when there is an abandon-ship situation. They can also issue warnings when the user gets access to a dangerous zone without someone to accompany them. These systems will be even stronger in 2025 when the IoT will be integrated with smart muster stations.

1. Biometric Identification and Facial Recognition.

Passenger verification is now widely done through biometric facial recognition, whereby passengers do not have to be checked manually by using documents.
This technology has been used in the cruise terminals by CBP and Royal Caribbean and it enables passengers to go through the security checkpoints within a few seconds rather than taking several minutes. The cargo terminals are also starting to implement biometric authentication of the port worker, truck driver and crew to eliminate unauthorized access.

2. Artificial Intelligence-based monitoring and threat discovery.

Behavioral analytics is the AI-based security cameras that are used to identify suspicious behavior at ports and aboard the ships. Live trackers inform the police about suspicious activities, e.g. when an individual boards the plane without permission or handles containers.

There are ports that are incorporating the use of drones and automated patrol systems to improve the levels of surveillance.

3. Cargo Security using blockchain.

Digital records that cannot be tampered with assists in the prevention of fraud and secure record keeping of the international shipments.
Cargo tracking systems based on blockchain enhance the visibility of the supply chain, minimizing the theft of the cargo and illegal deliveries.

4. Enhancement of cybersecurity in Ports and Ships.

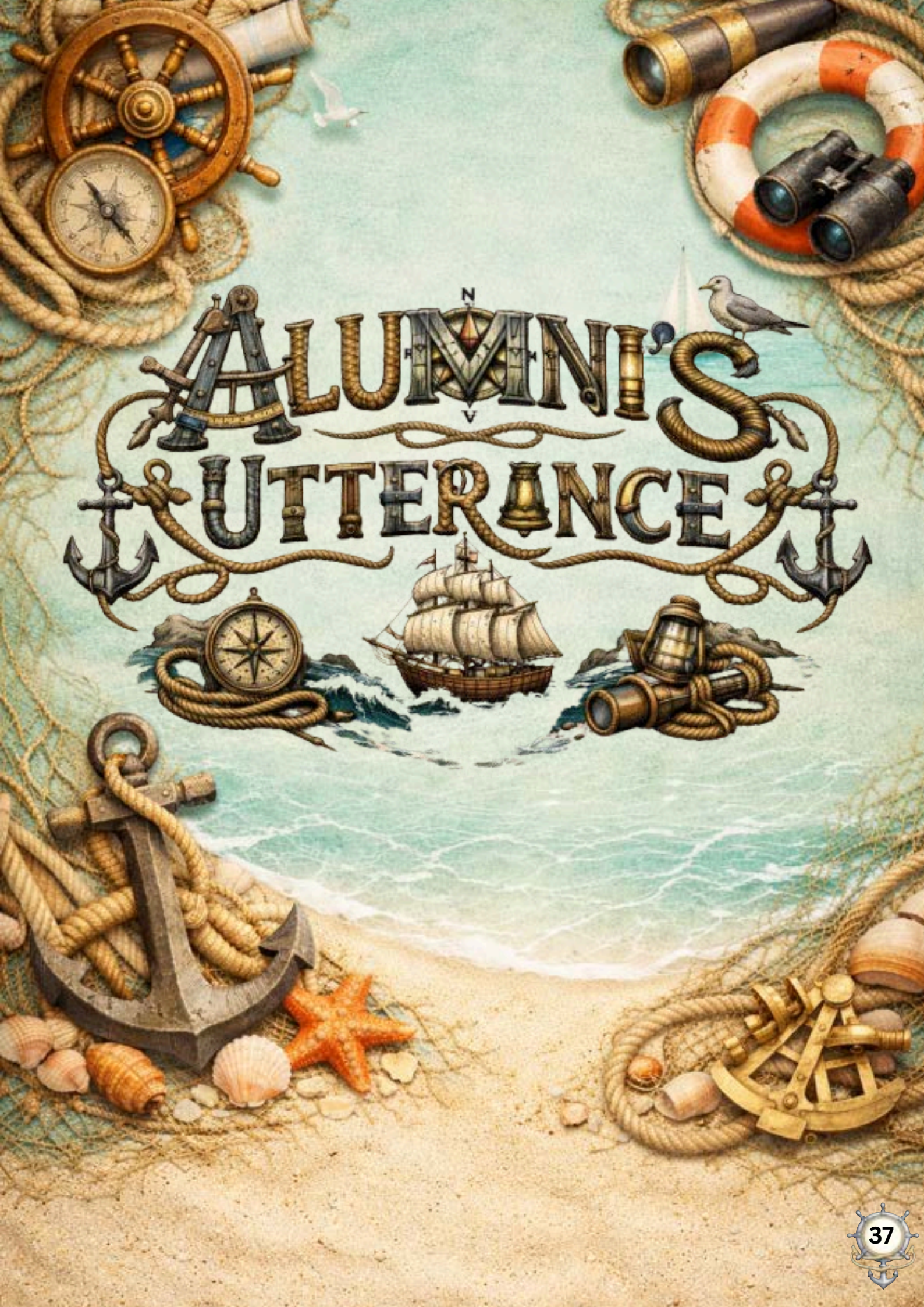
Modern vessels are now equipped with firewalled nets and encrypted communications in order to ensure that they are not targeted by cyberattacks.
Threat detection is an automated process, which detects suspicious activity in the network before hackers can infiltrate and destroy important systems.

CONCLUSION

The safety and security of the sea is still the keystone of trade and economic stability across the world. Along with the changes in the maritime industry, the changes in the risks have also changed, thus the need to constantly respond to the changing global environment with enhanced regulations, technologies, and international collaboration. New technologies such as AI, blockchain and smart surveillance are changing the way ships work and how threats are handled. Still, such issues like cost, cybersecurity concerns, and gaps in regulations require improvements. In the future, striking the right balance between human experience and technological development will be the main difference between safer seas and securing the environment, as well as the sustainability of the efficiency and reliability of global maritime activities.

REFERENCE

- Anglo-Eastern Ship Management Technical, Crew & Newbuilding Services
- https://www.shipuniverse.com/news/security-innovations-in-maritime-strengthening-safety-and-efficiency/?utm_source=copilot.com


ALUMNI'S
UTTERANCE

From Campus To Corporate
A Journey of Growth

It is indeed a pleasure to share a few words about my college in the annual school magazine as a former student.

The Gregorian calendar shows that it has been more than a decade since I left college but it feels like only yesterday. From the familiar settings of home and school, I walked through the college gate for the first time with little knowledge of the world that lay ahead. With me, I carried suppressed fear, questions unanswered, dreams to achieve and an indescribable thrill of being admitted into an institution of repute.

The four-year degree course was a journey through the hills and valleys. We were subjected to many hard and challenging tasks and put under heavy pressure which only aimed to make us tough and unbeatable in the pursuit of excellence. Reading was not confined to textual mugging but went much beyond textbooks. The college created an ideal space to cultivate knowledge and learning, share thoughts and exchange ideas. Here, I would like to thank my professors who were aficionados of knowledge and our Lodestar. Thanks are owed to the non-teaching staffs also who served in various capacities and ensured that the institute performed smoothly.

It was my journey from darkness to light, from ignorance to bliss. By the time we reached our last semester, we were all fit to step into the bigger corporate world and ready to shoulder responsibilities with the needed confidence, maturity, technical know-how, theoretical facts and brisk readiness.

Over the years the college has strived to maintain its position as a trustworthy and high-performing institute in the state which has delivered students in every discipline and is constantly ameliorating its standards to meet the ever-changing demands of the market and the world at large. My best wishes remain with every person associated with the college and I remain indebted to my alma mater for aye for shaping me as a responsible, diligent and truthful citizen of the world.

~ Mr. Shibadyuti Howladar
2nd Engineer, MSC
(2009-2013 Batch)


GME'S
reflection

ThePost-Grad Adaptability

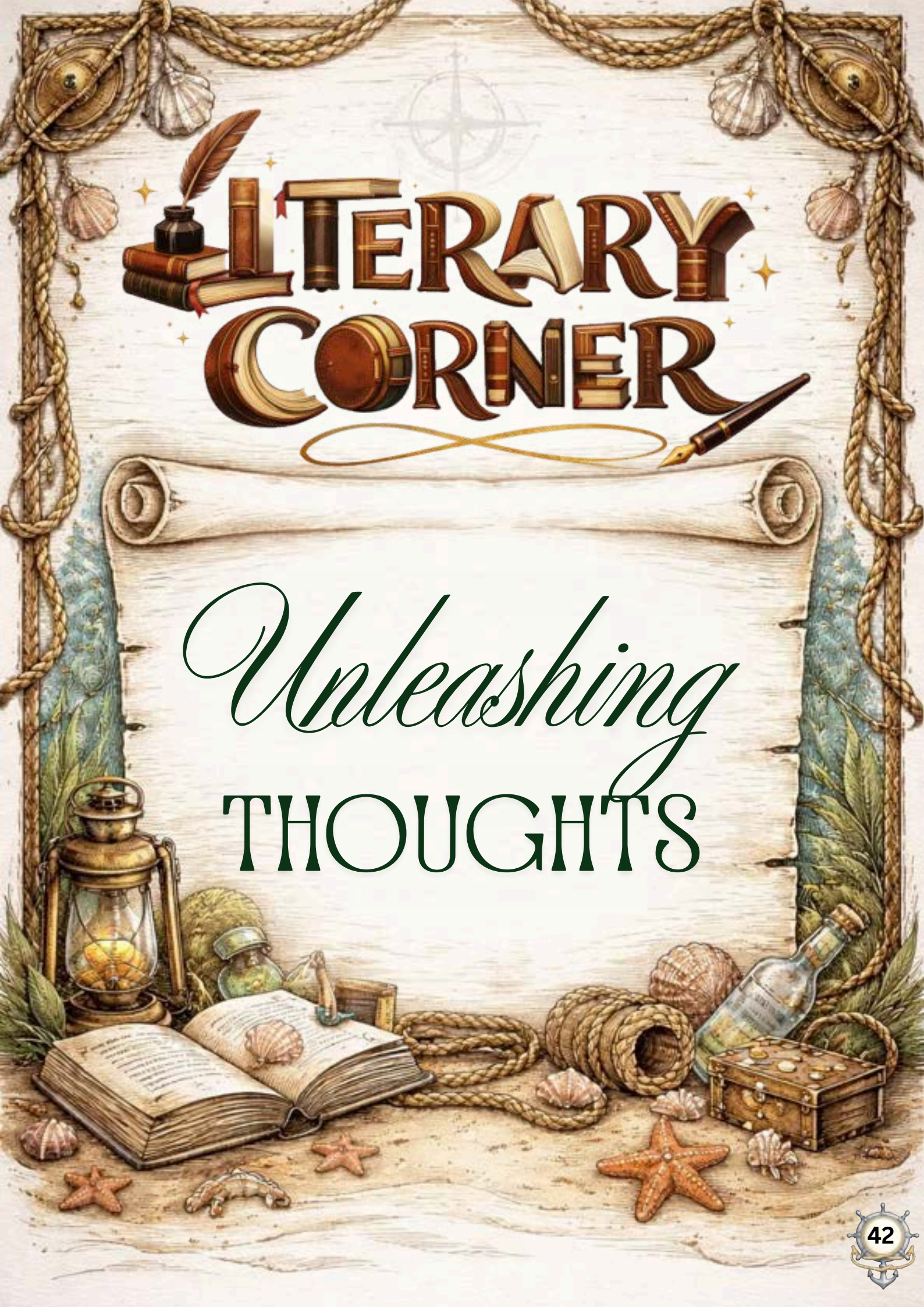
My name is ‘Sandeep Kumar Yadagiri’ and, I am from Andhra Pradesh.
I came to West Bengal to pursue My Postgraduation in Marine Engineering at The Neotia University. For me this journey was not just about education, but also about stepping out of my comfort zone and experience a completely new environment, culture, and way of life.

When I first arrived here everything felt different the language, the food and the surroundings. It was challenging in the beginning, especially being away from my home and family. But slowly, I started adapting, and a big reason for that was the support, I received from the faculty. The faculty at this university have been more than just teachers to me. They have been my mentor, guides and constant source of motivation. Their teaching approach made even complex Marine Engineering concepts to understand easily. They always encouraged us to think practically and not just depend on theoretical knowledge.

One thing I truly appreciate is how approachable the faculty members are. Whenever I had doubts, whether academic or personal they were always ready to help. Their guidance helped me improve not only my technical knowledge but also my confidence. They shared their real-life experiences from the marine field, which gave me a clear picture of what lies ahead in this field. It was definitely challenging during my journey about the, tight schedules, practical classes, assignments and exams. At times, it felt overwhelming, but the constant encouragement and support from the faculty and my friends brought me through this. They teach me, how to be discipline, how to manage time and what my responsibilities are, because these are much essential for every marine engineer.
Apart from academics, interacting with different people made me learn more about people. Interaction with different people made my communication skills better and increased my adaptability. But among all these experiences, the role of the faculty stands out the most in shaping my journey. Today, when I look back, I feel proud for what I have become and always think that the journey from a stranger to a confident man was not that easy. But now, I am ready for my future, this

journey has truly transformed me. I would like to sincerely thank all my faculty members especially- Tamal Sir, Atanu Sir, Somen Sir, Sanjay sir, Pradip sir, Anirban sir, Subir Sir and Tapan sir for their continuous support, patience and dedication towards me for my development. And I would like to add that please stay with me and guide me on my career path.

My time at 'The Neotia University' has been one of the most important phases of my life. It has not only given me knowledge but also helped me grow a more responsible and confident cadet.


LITERARY
CORNER
Unleashing
THOUGHTS

THE VIZAG BOARDING INCIDENT

We were sleeping in our cabin, me in the upper bunk. I was tired after the unnatural manual labour we had to endure carrying the heavy wooden pieces on the main deck. Either from forward to aft or aft to forward. We were arriving at Vizag anchorage in the night.

Suddenly, there was a knock on the cabin door,

"Anchor stations. Dono cadet ko agay janay bola Chief Officer" bellowed the Andhra helmsman with his typical accent.

Peter yelled at me from the lower bunk, "Get up lazybones or we will be late because of you."

Reluctantly I jumped out of the bunk and slipped on my boilersuit or coveralls.

"You ready, let's hurry up", shrieked Peter.

We slipped into our safety shoes and helmets hurried down the two companionways opened the accommodation water tight door and hurried on to the deck.

It was dark the time was around midnight; the moon was hiding behind fleeting clouds. The moonlight was coming and going; on the way forward, we were tripping over the sounding caps and the eye pads. Somehow we managed to reach the forecastle deck where stood our Chief Officer or "Malum Saab" Lt. Commander. Chaddha, he had recently retired from the Indian Navy to pursue a career in the merchant navy.

"Cadets come here" yelled the diminutive man clad in his immaculate uniform with his gleaming three striped epaulettes under the forward-facing working lights. We rushed up to him gazing at him. He was perched on a platform under the jackstaff at the foremost portion of the ship with a walkie talkie in his hand, its telescopic antenna reached nearly 3 feet!

"Look ahead on the port bow that flashing green light," he bellowed.

We peered through the darkness and located a dim green flashing light about 30 degrees off the port bow of the ship.

"Yes sir! "We ejaculated in unison.

"That is the wreck of PNS Ghazi the Pakistani submarine we torpedoed in the '71 war."

We gazed in the darkness over the water at the flashing light wondering at the iron coffin beneath the waters. I shuddered in the darkness.....

Soon we were brought out of our dreaming by the loud stern voice of the Captain B. His wife had just gone home from the last port of Calcutta and his mood had become very cantankerous.

“CHADDHA, HAVE YOU GONE TO SLEEP” he thundered, “IS THE PORT ANCHOR READY?”

“Yessir getting it ready”, replied our Boss Ch. Officer Chaddha.

“WHAT DO YOU MEAN, ...WE ARE NEARLY AT THE ANCHORAGE, GET IT READY FAST”. Shouted the Old Man Capt. B. from the bridge. The ship was around 508 feet long and we could hear him from the bridge wing as his voice carried to the Forecastle deck!

We didn’t require a walkie talkie to hear him.

“Chippy, “Ch. Officer Chaddha cried “Get the port anchor quickly, ready outside the hawsepipe”.

Chippy was our Carpenter or Mr. Barretto who was in-charge of the anchor stations along with the Serang or the Boatswain. We had to lower the anchor out of the ship, just above the water so that when the brake was released it would run freely and anchor the vessel, when instructed by the captain.

“Cadets help them,” ordered the Ch Officer Chaddha.

We ran forward to open the anchor wires restraining them and then the brake was tightened. Slowly the gypsy was brought in gear and the brake was released slowly. The Chippy was at the windlass or the winch for lowering the anchor.

The Chief Officer and the Serang ran forward to stand on the small platform to look overside to check the anchor lowering process. He then continuously signalled the Chippy to lower the anchor.

“Stop, stop”, Ch Officer Chaddha beckoned to the Chippy. Who immediately stopped the winch and tightened the brake and took out of the gear so that the anchor would run free when the brake was released.

We ran forward next to the Ch. Officer’s location to see the position of the anchor which lay swaying just above the waterline.

“Bridge, port anchor ready for letting go from above the waterline., Sir.” Reported Ch Officer to the Bridge.

“GOOD CHADDHA, make it 5 in water,” replied the now calm Capt. B.

“Yessir” we both replied nodding our heads together.

Soon we had released the 4 more shackles and our ship lay calm and serene pointing in the same direction as the other ships, motionless in the water.

“Brought up to 5 on deck” our Ch. Officer told the Capt., indicating that the ship was held truly by the anchor.

“That will do forward, secure everything and that will do forward, and make sure you come up at 0400hrs.” Retorted Captain B.

“Yessir” replied the Ch. Officer scowling at us.

It was nearly 0130 am and 0400 am Ch officer’s anchor watch used to start. So, he had just about two and a half hours sleep in the night!

Soon we tightened the brake and hoisted the anchor light and put the anchor ball in position - the day signal for an anchored vessel.

“Finished with for’d stations sir.” Chirped Ch. Officer Chaddha.

“Roger sir” replied the Third Officer Ray. Captain had given the walkie talkie to Third office as the anchoring had been completed.

“Come on, finished with stations” Ch. Officer told us and Chippy.

“Yes sir” Peter and I retorted.

We sauntered behind Ch. Officer,” CADETS report at seven o’clock as usual”, suddenly roared Ch. Officer.

“Yes sir,” we mumbled.

We had hardly five hours of sleep before another tiring day; we ran back to our cabin changed into our nightclothes and fell asleep dreaming of the destroyed submarine.

Suddenly, there was a loud thumping noise on the door “Cadets come on deck now Hallagari wants you on deck now” shouted our senior cadet Sen. Hallagari was the name for our Ch. Officer because he was always shouting and in a hurry.

I was getting tired of waking up early and, I turned the other way putting the pillow over my head covering my ears

“Because of you we’ll get punished”, sobbed Peter.

“OK OK coming” I reluctantly replied.

“Yessir” replied Ch Officer Chaddha.
Slowly we could see the ship was reducing her speed and nearly coming to a stop. It was gliding smoothly on its momentum. Then it steadily turned to port or left when wavelets broke and sprayed us on the forecastle and covered us with a layer of the sea water.
I tasted the salt in the seawater, and it was an overwhelming experience. Well, I had become a saltwater sailor and couldn’t wait to tell my friends at home.
Soon I was brought out of my thoughts by my friend Peter nudging at me and shrieking, “Can’t you hear Ch Officer telling you to put on your safety goggles.”
“Yes sir” I nodded slipping on the goggles over my eyes.
“STAND BY FORWARD” thundered the Capt.
Once again, we didn’t require a walkie talkie to hear his bellows.
“Standing by forward to let go port anchor” replied Ch Officer Chaddha.
“Roger’” replied the captain.
We were waiting forward looking at the darkness faintly we could make out some anchored vessels in the distance and also the now dim flashing light of the wreck buoy behind us to our port.
“FORWARD LET GO PORT ANCHOR” once again the Capt. shouted.
Immediately the Ch. Officer replied “Let go port anchor sir” to the captain and simultaneously gesticulating to Chippy.
Without losing a second the Chippy said, “Let go sir” and he released the brake turning the levers around using a long piece of wood to get mechanical advantage, Peter and the Serang helping along.
Suddenly, the heavy studded links of chain began to hurtle pass us raising a cloud of dust and mud and pebbles as it went down the hawse pipe.
The Chief Officer reported “Port anchor let go, one in the water”. Indicating that one shackle or27.5 metres of chain was down.
Then we saw that Ch. Officer was peering down the edge of the ship to try to see the chain.
“There,” he pointed to us, “Can you see the white painted joining shackle, that is the 1st shackle marking”.

I jumped down from my bunk and put on my boilersuit, my safety shoes and helmet and ran after Peter who was already nearly one deck down. One more deck and we would be on the main deck.

As soon as I was about to open the access door to the main deck, I heard a shriek from my friend Peter "Oh God help us".

I started praying to God to help us, wondering what was it which made Peter so scared.

I opened the door and the blast of cool sea air hit me, but I saw our deck was full of swarms of dark-complexioned men clad only in loincloths and in their hands, they held crisp hundred-rupee notes.

My God! This was a scene from our childhood Jules Verne book "Twenty Thousand Leagues Under the Sea" where the savages had boarded the "Nautilus" Capt. Nemo's submarine.

"CADETS" roared Ch. Officer from the bridge wing far above the main deck like a tiger.

"Tell THEM to disembark NOW".

I started to follow Ch. Officer's orders.

"What are you doing," said Sr. Cadet Sen grabbing my hands. "Can't you see the knives in their hands."

I then saw the knives gleaming in the early morning sun. They were hidden in their other hand.

I immediately retreated behind the hatch. Then I saw with amazement a lot of the crew members were coming with brand new boxes of Japanese radio cassette recorders, mixers and other electronic items. They handed them over to the loin cloth clad men in exchange for crisp notes!

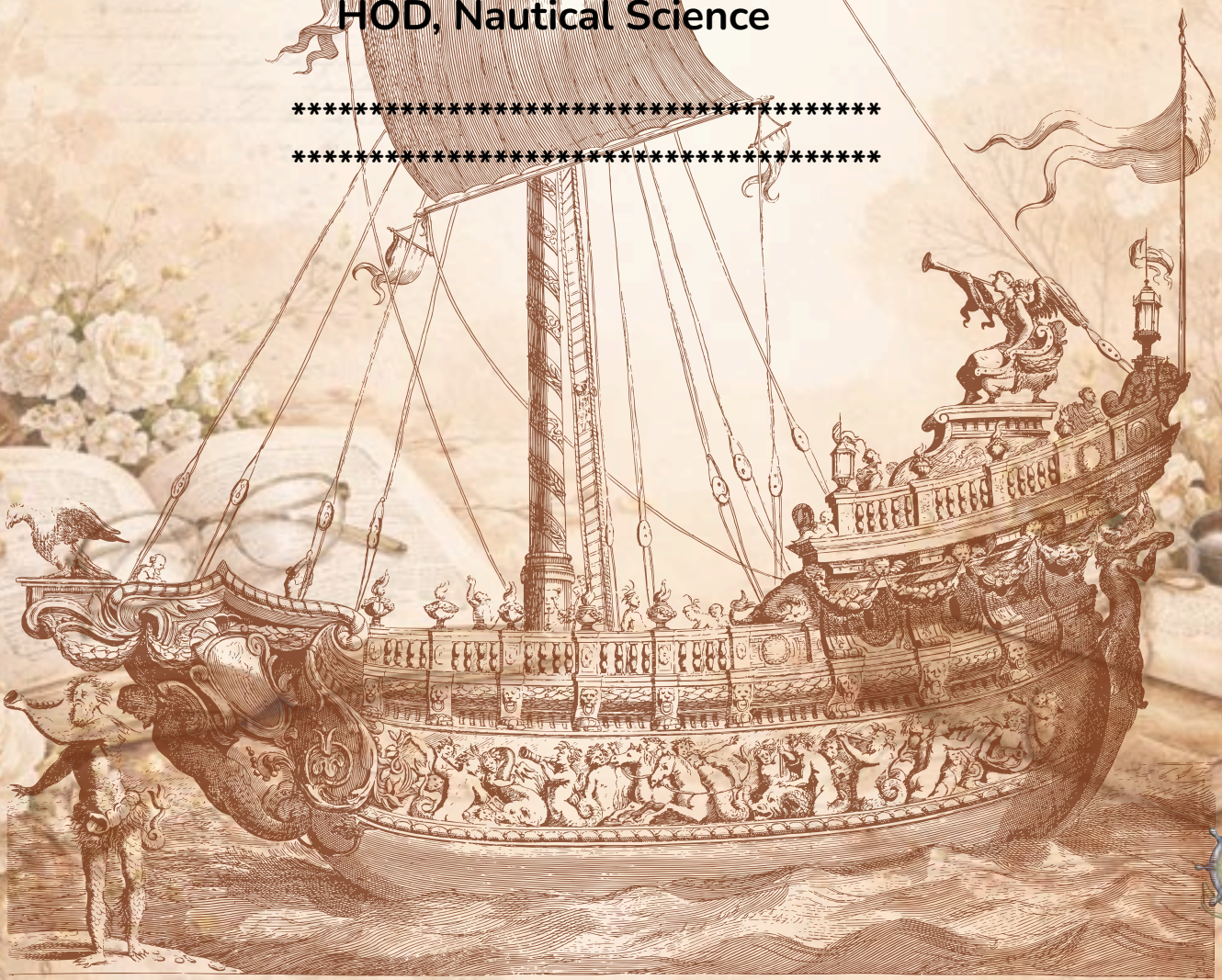
They were selling to these men and these boxes were being lowered on to the water. I peered down the shipside to see that a number of small boats were next to the ship and the booty was being lowered there.

Suddenly, I saw that the pirates started lowering themselves on to the canoes with the help of ropes.

Soon they sped away from the ship. Peter and I were left alone on the deck and we were blazed by the early morning sun which was a beautiful golden yellow disc coming out from the sea piercing the clouds. It was the beginning of a new day, a new day where we were near the sunk enemy submarine and deterred the loinclothed men who had boarded the ship. In one day, I had grown older and started facing the realities of life.

~Capt. Diptesh Bhattacharya
HOD, Nautical Science

****
****



Cigarettes

Pite ho tum mujhe, Ye gum bhulane ke liye... Bujhate toh tum mujhe, Ye asu chupane ke liye....

Sulagti inn chingariyon main, Hain kitne raaz chipe..... Behti meri dhuaon main, Behte kitne armaan tumhare....

Ab jb khatam hone ki baari aayi, Tumhe apne pyaar ki yaad aayii.... Arrey pagal!! Woh kb ki chli gyi, Lipte behti hogi ek hi rajai.....

Tumhare asu aur dard sirf main samajhta hu, Isiliye toh tumhare saath abh bhi sulagta hu....

Rehna hain akhri tk, ye mujhe pta h, Lekin sirf dukh ki awaaz sunu ye kaisi sja h???

~ Pratyay Sarkar
4th Year, MRE

USAGE

Learned to live From you.
The way I lived yesterday-
hiding some pain behind my smile,
staring into the mirror that taught
me not to show,
not to show the tears
I left behind that smile.
Is it so hard to become someone
even you do not yet know?
I asked my diary
how I treated her.
Now, yes, I am alone-
wounded by words,
by the alphabets
I once used to weave verses for her.
I want to know her more,
yet the ink of my pen is not enough,
nor is my heart strong enough
to bear this pain.
Used by me,
and loved by me????
Ohh!! I asked my bed
how I treated her.

~ Kushal Sinaa
1st Year, BNS

WHERE_THE_RIVER_CARRIES_YOU

At dawn, the ghats of Varanasi breathed a pale blue mist, and Aarav folded his father's old shawl over his arm like a promise he wasn't sure he could keep. The river slid past, patient as memory. He had returned after twelve years away, carrying a foreign degree and a local grief, to sell the house where his childhood still waited in those corners.

Inside the house, dust rose when he walked, each step waking a story. His mother's bangles slept in a tin box. His father's ledger lay open, unfinished, the last page marked by a pressed marigold. Numbers stopped mid-line, as if even arithmetic had bowed to silence.

At the ghat, Aarav watched pilgrims release leaf boats stitched with candles. He remembered his father's voice: the river is not a thing you own; it is a thing that carries you. As a boy, he had argued, certain that progress meant leaving. As a man, he wondered who had been carried farther

A boatman called out, asking if he wished to cross. Aarav shook his head. Instead, he lit a candle and placed it on a leaf. The flame trembled, then steadied. He did not pray for forgiveness or success. He prayed for attention—the courage to see what had always been offered.

That evening, he did not sign the sale papers. He swept the courtyard, repaired a broken hinge, and opened the windows to let the river's breath in. He would stay awhile, teach at the neighborhood school, learn the names of the seasons again.

When night came, the river reflected a thousand small lights. Aarav realized that meaning was not a destination abroad or a relic at home. It was the act of choosing, each day, to belong. Quietly, he understood roots grow wherever responsibility and love are practiced.

~Debayan Mallick

1st Year, MRE

FROM the BRUSHES of SOMS

by Cadet

PRIYANGSHU GORAI

BNS 1st Year

by Cadet TISHA PATEL

BNS 1st Year

by Cadet ARIJIT GHOSH

BNS 2nd Year

by Cadet

PRATITEE BERA

BNS 1st Year

by Cadet

SUMANA GAYEN

BNS 2nd Year

by Cadet

ANKAN PAN

BNS 1st Year

by Cadet

HIMANSHU PRAKASH

MRE 4th Year


FROM THE
lens
of
SOMS

by Cadet

BAIBHAB GUCHHAIT

BNS 1st Year

by Cadet

SUN SARDAR

BNS 2nd Year

by Cadet
SWAGATA SASMAL
BNS 3rd Year

by Cadet
ARIJIT GHOSH
BNS 2nd Year

by Cadet
RANIT MONDAL
BNS 1st Year

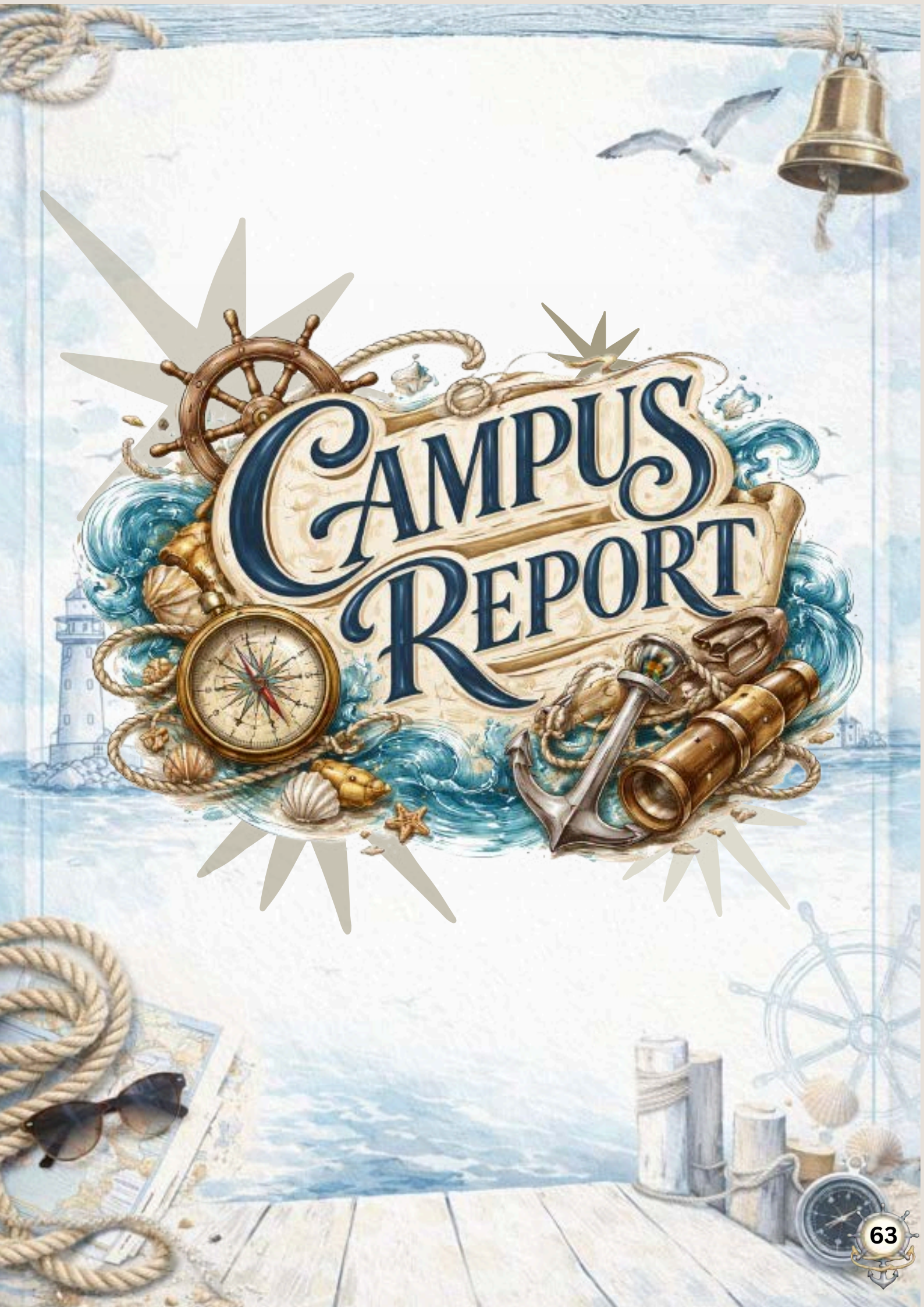
by Cadet
DIPANKAR DAS
BNS 3rd Year

by Cadet
ANIK BAKULI
MRE 2nd Year

by Cadet
DIPANKAR DAS
BNS 3rd Year

by Faculty

SUBIR BASU


CAMPUS
REPORT

Farewell

28TH JULY

15TH August

Ship VISIT

22ND August

National SPORTS DAY

30TH August

TEACHER'S DAY

5TH SEPTEMBER

Tree Plantation

17TH SEPTEMBER

WORLD Maritime DAY

25TH SEPTEMBER

Magazine PUBLICATION

Blood Donation Camp

12TH NOVEMBER

FRESHERS

14TH NOVEMBER

IMU

Paper Presentation

15TH NOVEMBER

STEW

22ND DECEMBER

Our Family

Our Obligations

BNS
1ST YEAR

MRE
1ST YEAR

DNS

BNS
2ND YEAR

MRE
2ND YEAR

MRE
3RD YEAR

BNS
3RD YEAR

MRE
4TH YEAR

GME

THANK YOU

for reading

LEGEND- BUILDING

A. ADMINISTRATIVE BLOCK

1. ADMINISTRATIVE BUILDING (G + V)

B. ACADEMICS BLOCK

2. SCHOLASTIC BUILDING - 1 (G + III)
3. SCHOLASTIC BUILDING - 2 (G + II)
4. SCHOLASTIC BUILDING - 3 (G + III)
5. SCHOLASTIC BUILDING - 4 (G + III)
6. SCHOLASTIC BUILDING - 5 (G + III)
7. WORKSHOP BUILDING
8. NEW WORKSHOP BUILDING
9. NEW PHARMACY BUILDING (G + III)
10. PHARMACY BUILDING (G + III)
11. SHIP IN CAMPUS (G + III)

C. AGRICULTURE & FISHERY SCIENCE BLOCK

12. POLY HOUSE & NET HOUSE
13. FISHERY SCIENCE PROJECT AREA - 1
14. AGRICULTURE PROJECT AREA - 1
15. FISHERY SCIENCE PROJECT AREA - 2
16. AGRICULTURE PROJECT AREA - 2
17. FISHERY SCIENCE PROJECT AREA - 3
18. AGRICULTURE PROJECT AREA - 3
19. FISHERY SCIENCE PROJECT AREA - 4
20. AGRICULTURE PROJECT AREA - 4
21. AGRICULTURE PROJECT AREA - 5
22. FISHERY SCIENCE PROJECT AREA - 5
23. FISHERY SCIENCE PROJECT AREA - 6
24. AGRICULTURE PROJECT AREA - 6
25. MUSHROOM UNIT
26. FIELD LAB
27. STORE HOUSE
28. SERICULTURE UNIT
29. THRESHING FLOOR
30. BIO GAS PLANT
31. CATTLE SHED
32. VERMI COMPOST PIT
33. BIO FERTILIZER PLANT

D. RESIDENTIAL BLOCK

34. BOY'S HOSTEL - 1 & 2 (G + III)
35. BOY'S HOSTEL - 1 & 2 (G + III)
36. BOY'S HOSTEL - 1 & 2 (G + III)
37. OLD STAFF QUARTERS (G + III)
38. NEW STAFF QUARTERS (G + III)
39. NEW STAFF QUARTERS (G + III)
40. DIRECTOR'S RESIDENCE (G + I)
41. OLD STAFF QUARTERS (G + III)
42. GIRLS HOSTEL - 3 (G + III)

E. UTILITY & SERVICES BLOCK

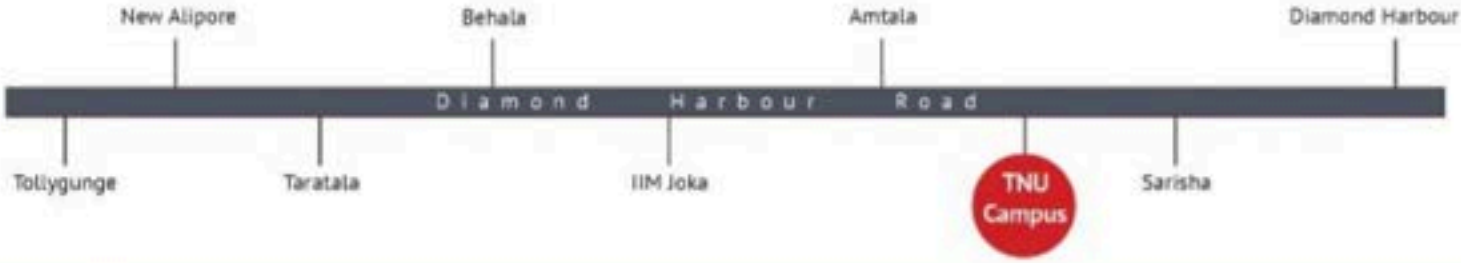
43. ELECTRICAL ROOM
44. PUMP ROOM

F. RECREATIONAL BLOCK

45. FOOTBALL GROUND
46. CRICKET GROUND
47. SWIMMING POOL
48. MULTI PURPOSE HALL
49. BASKETBALL COURT (3 NOS.)

G. HEALTH BLOCK

50. MEDICAL UNIT



AmbujaNeotia

THE NEOTIA UNIVERSITY

UGC Enlisted & Recognised

Campus: Sarisha, Diamond Harbour Road, 24 Parganas (S), West Bengal - 743 368
Head Office: Vishwakarma, 86C Topsia Road (S), Kolkata - 700 046
Campus: +91 70444 46888 / **Head Office:** +91 70444 46999 | **Email:** contact@tnu.in