AmbujaNeotia

THE NEOTIA UNIVERSITY

ज्ञानम् आत्म प्रदीपाय UGC Enlisted & Recognised

Safety in Shipping - New and Adapted Technologies

Vol-2, Issue-2

ACADEMIC AND CAMPUS DIARY

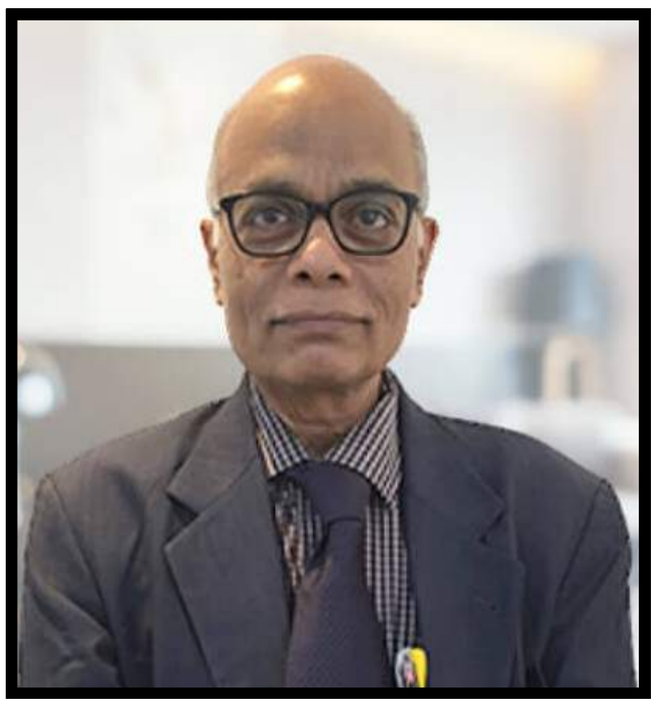
ABHIJAN

SOMS

GELEBRATING 78TH INDEPENDENCE DAY

AUGUST 2024

Foreword from VC



I am very happy to learn that like other Institutes/Schools of our University, the School of Maritime Studies is also going to publish its e-magazine 'ABHIJAN' vol. 2, Issue –II with a focal theme 'Safety in Shipping – New and Adopted Technologies.'

'Abhijan'means 'Exploration' and exploration started from ancient days when African ancestors started migration from East of Africa to all over the globe for shelter, food and peaceful living. The water ways were the medium of migration. There is some evidence that modern humans left Africa at least 125,000 years ago by using two different routes: one- through the Nile Valley, the Sinai Peninsula and the Levant and other route through the present-day Bab-el-Mandeb Straight on the Red Sea, crossing to the Arabian Peninsula and settling in places like the present-day United Arab Emirates (UAE) and Oman and possibly reaching the Indian Subcontinent. Thus water ways were the route for transportation from early days. However, the transportation through water ways faced various difficulties like natural calamities as well as vessel quality in overcoming adverse situations.

As time passes, faces change and new technologies emerge in providing better safety and security. Today we are controlled by the virtual systems which can predict about weather, provide geographical locations and indicate about the machinery safety and security aspects. The control room of marine vessels are now enriched with computerized systems in controlling even from distant locations also.

The emergence of new technology and integration of 'Artificial Intelligence' (AI) with control systems offer better safety and security. This is called development of human resources on these aspects.

The e-magazine "ABHIJAN' portrays the potential of the community of School of Maritime Studies through their potential ideas and boundless imaginations which have been presented in the volume of e-magazine.

"Education is the most powerful weapon which you can use to change the world"- keeping up with this valuable philosophy of Nelson Mandela, the student's community of our School of Maritime is putting down their thoughts, imagination and creativity in bringing safety and security while making their journey in the water vessels.

I whole-heartedly convey my good wishes to the entire community of School of Maritime Studies for regularly publishing the e-magazine. I expect that the presentations in this present volume brings some new concepts by providing new ideas in safety and security when they will be in the 'Pilot / Captain' seat.

BISWAJIT GHOSH
VICE CHANCELLOR

Director's Desk

Another happy moments for us – publication of fourth successive issue on the eve of 78th Independence Day .
We started this journey in the month of Feb. 2023 and successfully continuing publications of our digital magazines at regular intervals , each time on a different maritime issue , with great enthusiasm and spirit displayed by our cadets. This magazine has drawn a lots of attention and appreciation not only inside the university but also from Indian Maritime Industry.
This time the theme is " Safety in Shipping – new and adapted technologies " - in shipping , safety is first priority and therefore, the industry continuously thrive to balance safety needs with new emerging technologies . The theme is very appropriate and well timed in view of development of *Autonomous vessels & Digitalisation* .
The shipping industry is expected to undergo significant transformation in the coming years, driven by a range of emerging technologies. Such as :
Autonomous ships: **The development of autonomous ships is expected to revolutionize the shipping industry by reducing the need for human crew and increasing efficiency and safety.**
Digitalization: **The use of digital technologies, such as blockchain, the Internet of Things (IoT), and artificial intelligence (AI), is expected to significantly improve the management and operations of ships and ports.**
Decarbonization: **The shipping industry is under increasing pressure to reduce its environmental impact, and technologies such as alternative fuels, fuel cells, and energy storage systems are expected to play a key role in achieving this goal.**
Advanced materials: The use of advanced materials, such as composites and lightweight metals, is expected to improve the efficiency and sustainability of ships by reducing weight and improving durability. Augmented and virtual reality: These technologies are expected to enhance training and simulation for crew members, improving safety and reducing the risk of accidents.
Drones: **The use of drones is expected to improve the efficiency and safety of shipping operations, particularly in areas such as cargo inspection and port security.**
I hope the above issues are adequately addressed alongwith the risks and mitigation to ensure safety in shipping in this publication and will be referred as a milestone in the field of Shipping magazines under the able guidance of Editorial team.
I wish to avail this platform to share TNU announcement to commence new maritime courses shortly " *Diploma in Nautical Science , Post Graduation Diploma in Marine Engineering , OrientationCourse for Catering Personnel* " under the approval of Directorate General of Shipping .
Wish you all the very best for your hard work and commitments .
Jai Hind.

MR. PARTHAPRATIM SAHA
DIRECTOR OF SOMS

HOD's Preface

MRE

I am privileged to greet everyone from the desk of the Head of the Department of Marine Engineering at The Neotia University's School of Maritime Studies, about the launching the latest edition of our e-magazine, 'ABHIJAN'. Since its inaugural voyage in 2023, 'Abhijan' has continued its journey as proof of our cadets' creativity and innovation skills. Today, we are proud to present Volume-II, Issue-II, focusing on the pivotal theme of "Safety in Shipping - New and Adapted Technologies".

Regarding this edition, our cadets have once again justified their excellence through the input of well-written articles, tunning artwork, and engaging stories that reflect their understanding and passion for maritime safety. This edition features new technologies and measures aimed at promoting seafarers' safety and well-being, an issue of great significance in the contemporary marine environment.

In the course of empirical advances in the contemporary maritime environment, as we navigate through the complexities of modern naval operations, ensuring the safety of our vessels and crew remains paramount. This edition of 'Abhijan' explores advancements in navigation systems, machinery maintenance, emergency response protocols, and safety equipment, highlighting how technology is revolutionizing maritime safety. Our commitment to fostering a culture of safety and continuous learning is evident in the contributions of our talented cadets.

I want to thank all the students, my fellow faculties and readers for such unwavering support and dedication. Your enthusiasm fuels our mission to impart essential skills, discipline, and resilience to our cadets, preparing them to face the challenges of the maritime world with confidence.

Together, let's continue to sail towards a safer and more innovative future, guided by the spirit of 'Abhijan'.

Wishing 'Abhijan' fair winds and following seas...

MR. ATANU ROY
HOD, MRE
SOMS

BNS

It baffles my mind as I write the Forward for our very own Maritime Magazine "Abhijan"- Vol-2, Issue II- August 2024. The selected topic for edition is-
Safety in Shipping: New & adapted Technologies.
As the old saying goes "Change is the only Constant" & going by it, Shipping stands no exceptional to the same. It is an established fact that the Maritime profession is one of the oldest profession in history & from wooden sail ships with hundreds of Sailors manning it, we have come to a stage where Vessels are sailing Unmanned- with none onboard!
The reason being Innovation & Technology advancement which has done such metamorphosis. From Star Finders to GNSS, from Paper Charts to ECDIS we have all witnessed the change of operating technology.
So hold tight & brace yourself to upgrade your very ownself to this Tech Era for your sustainability as you all venture to this era of rendering service to the Merchant Navy.

CAPT. SUBHRAJIT CHAKRABORTY.
HOD- NAUTICAL DEPT. (BNS). SOMS

Editor's Note

We at the School of Maritime Studies are thrilled to present this volume of Abhijan in the 50th year of The International Convention for Safety of Life at Sea (SOLAS) in which the International Maritime Organisation shall be celebrating the theme "Navigating the future: Safety first!"

In this volume, contributions from our Cadets delineate measures of safety, reliability and pollution control as envisaged and adapted for futuristic maritime propulsion and navigation ushering in new technologies and alternative fuels.

Our young cadets have understood that aiming for net-zero emission operations in the shipping industry are quintessential for mitigating the environmental impact caused by hydrocarbon fuel combustion. As the focus on the topic of alternative fuels is growing their safety characteristics are reviewed and safety measures are recommended based on current technological advancements. Comprehensive safety reviews on hydrogen, ammonia, and methanol use in marine engines, and the specific barriers and challenges for future research have been discussed.

We know that digitalization and automation are also being increasingly adapted in shipping for reliability, sustainability and efficiency of operations. Safety in these emerging technologies have also been discussed in the articles here. Need to thank our senior faculty member Capt. S. Saha for his valuable write up.

As we read these inputs from our cadets we understand that how even the youngest members in our industry are aware of a digitalized future of shipping providing decarbonised, emission-free, sustainable, and safe transportation over the waters.

The interesting pieces of short stories and poems show the fervor of creativity of our cadets. Their creative spirits also are on display with some imaginative art and photography.

I have to thank my colleague and fellow faculty member Shri Anirban Maity for his untiring efforts in constantly following up with all concerned for this publication.

For their constant encouragement and enthusiasm received I must profusely thank our Hon'ble Vice Chancellor, our Director and our Heads of Departments.

Wishing you all a pleasant reading

MR. TAMAL MUKHERJEE
MRE FACULTY,SOMS

Note from the coordinator

Dear Readers,

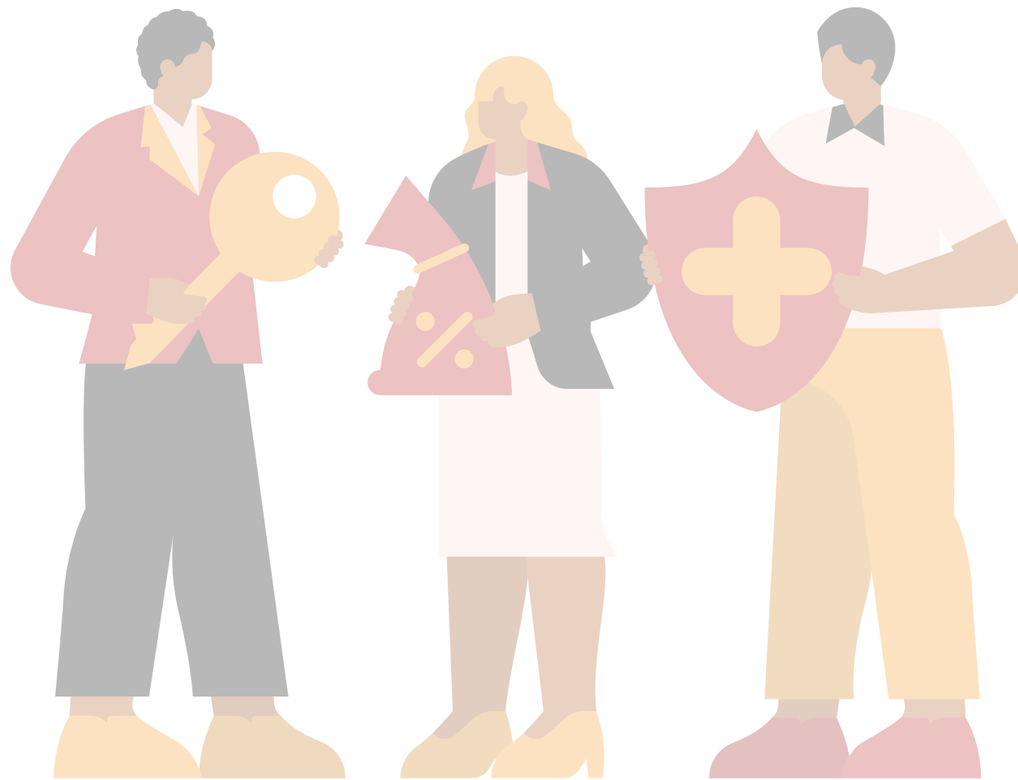
We are delighted and excited to share with you the latest edition of *Abhijan* (Vol-2, Issue-II, August 2024), released on the eve of India's 78th Independence Day. The theme of this edition is *'Safety in Shipping-New and Adapted Technologies'* in alignment with the celebration of the 50th Anniversary of the 1974 SOLAS Convention.

I would like to extend my heartfelt thanks to every cadet for their hard work and dedication in making this edition possible. Their efforts are truly inspiring. A special thanks to our Editor-in-Chief for his outstanding leadership, and to all who contributed with their technical papers, creative poems, art, and photography. I also appreciate our faculty members for their guidance in helping our cadets grow into confident seafarers.

We hope this issue is both informative and inspiring as we continue to explore the evolving world of maritime safety and technology.

Happy Reading!
Warm Regards,

ANIRBAN MAITY
COORDINATOR, ABHIJAN



EDITORIAL TEAM

SUDIP ADGIRI
(3RD YR. BNS)

PRATYAY SARKAR
(3RD YR. MRE)

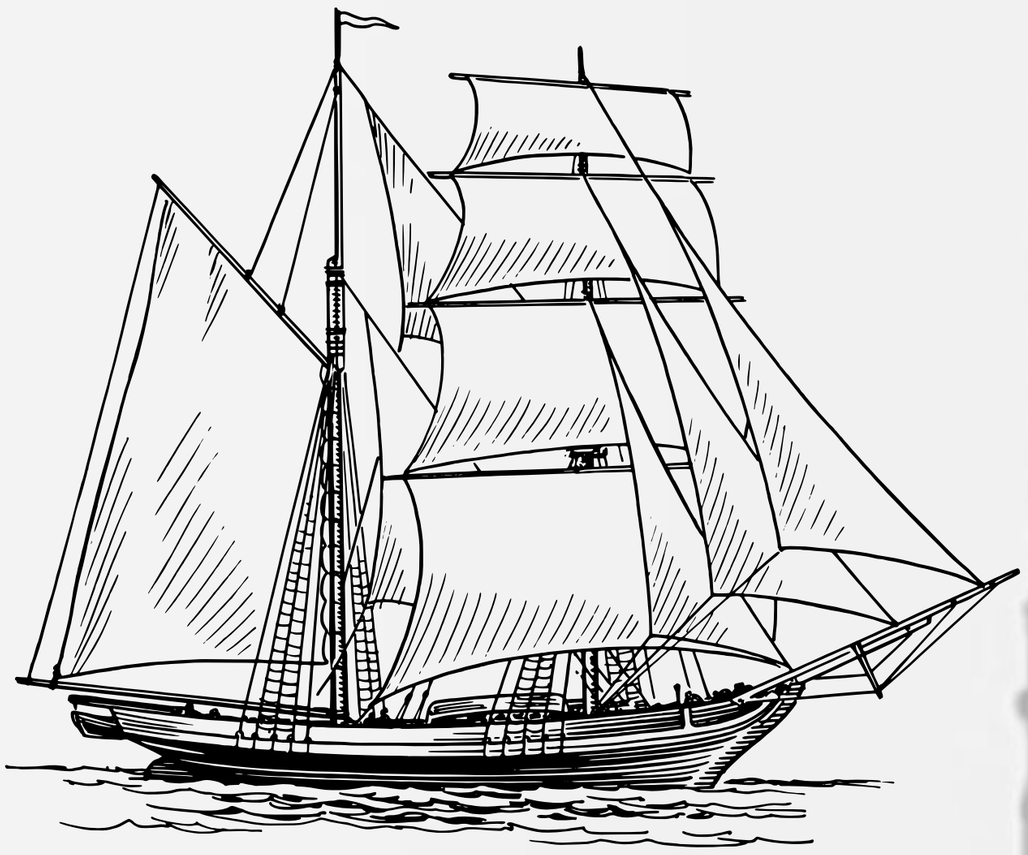
HARSH SINGH
(3RD YR. BNS)

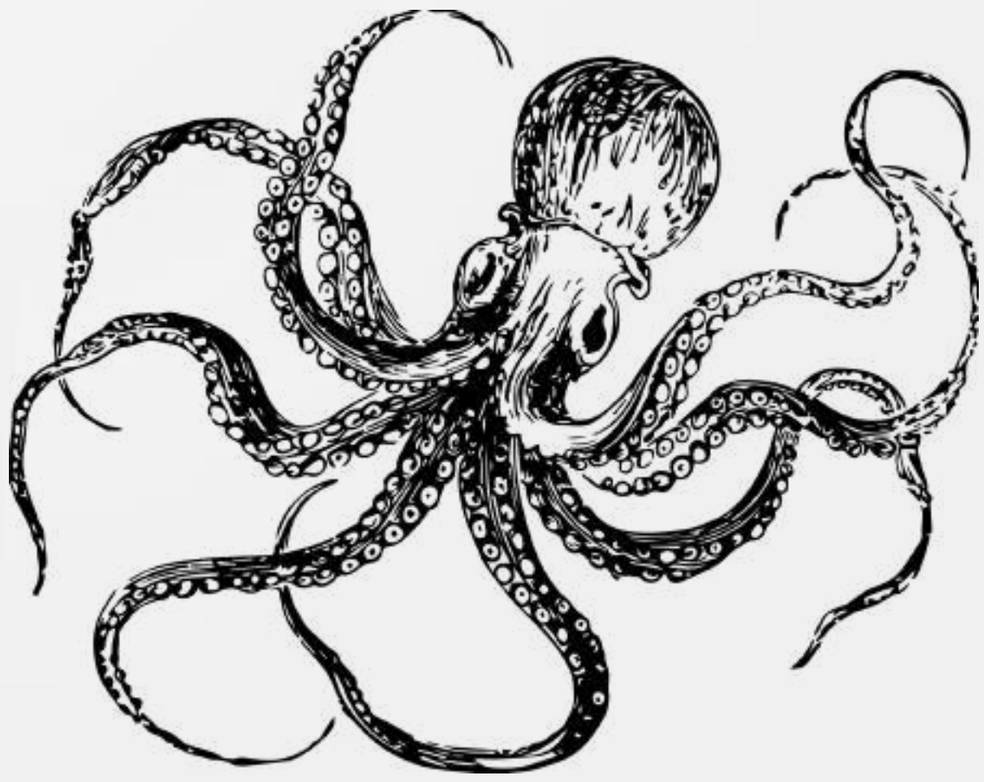
TAMAL CHANDRA DEY
(3RD YR. MRE)

ADITYA SHARMA
(3RD YR. BNS)

SOMALI MUNSI
(2ND YR. MRE)

TABLE OF CONTENTS





PIC SOURCE:INTERNET

REMOTE INSPECTIONS AND SURVEYS: A NEED OF THE HOUR

BY- SUDIP ADGIRI (BNS,3rd year)
PRATYAY SARKAR (MRE,3rd year)

“In attendance or remotely, a survey is only as good as the surveyor undertaking it.”

In recent times, the shipping industry has undergone a significant transformation due to the COVID-19 pandemic and the rise of digitalization and new technologies. The pandemic highlighted the importance of adaptability and resilience in the shipping sector, pushing companies to embrace digital solutions to navigate the challenges posed by the global health crisis. The integration of digital technologies not only helped streamline operations but also enhanced efficiency, transparency, and safety within the industry. This shift towards digitalization has not only been crucial during the pandemic but continues to be a driving force in shaping the future of the shipping industry. Among all the technologies adopted or coming in the near future the remote inspections and surveys is one of them.

WHAT IS REMOTE INSPECTIONS AND SURVEYS?

Remote inspection and surveys in the shipping industry encompass the practice of evaluating the condition of vessels and maritime assets through the utilization of digital technologies and communication tools, all without the necessity of being physically present at the location being assessed

This innovative approach enables marine surveyors and inspectors to conduct thorough evaluations, ensure compliance with regulations, and identify any maintenance needs or potential issues from a remote location. This digital transformation in the shipping industry not only increases operational efficiency but also plays a crucial role in adapting to the demands of a rapidly evolving maritime landscape.

HOW IS THE INDUSTRY CONDUCTING REMOTE SURVEYS?

1.VIA VIBRATION MONITORING

Vibration monitoring in remote surveys and inspections in the shipping industry is utilized to assess the mechanical condition of ship machinery and equipment from a distance. By installing sensors on critical components of the vessel, such as engines, pumps, and propellers, vibration data can be collected and analyzed remotely. This data helps detect anomalies, predict potential failures, and optimize maintenance schedules without the need for physical presence on the ship. By incorporating vibration monitoring into remote surveys and inspections, shipping companies can proactively address mechanical issues, improve operational efficiency, and enhance overall safety of the vessel and its crew.

2.LIVE STREAMING

Live streaming in remote surveys and inspections in the shipping industry is utilized to enable real-time visual assessment of ship components and conditions from a remote location. By using live video feeds, inspectors and surveyors can observe and analyze the status of various ship systems, structures, and equipment without physically being present on the vessel. This technology allows for immediate decision-making, efficient communication between stakeholders, and the ability to address any issues promptly. Live streaming enhances the effectiveness of remote surveys and inspections by providing a direct and interactive view of the ship's condition, facilitating quicker responses to maintenance needs and ensuring compliance with safety standards.

3.BY DRONES

Drones are commonly used in remote surveys and inspections in the shipping industry to provide aerial views and gather detailed information about ships and their surroundings. By deploying drones equipped with cameras and sensors, inspectors can conduct thorough inspections of ship structures, cargo, and equipment without the need for physical presence on the vessel. Drones offer a cost-effective and efficient way to monitor and assess ship conditions, identify potential issues, and improve overall safety and maintenance practices in the maritime industry.

4.AIS VESSEL TRACKING

AIS (Automatic Identification System) vessel tracking is commonly used in remote surveys and inspections in the shipping industry to monitor and track the movement of ships in real-time. AIS technology allows for the identification, location, and course of vessels to be transmitted and received by other ships and shore stations. By utilizing AIS data, inspectors and surveyors can remotely monitor ship traffic, track specific vessels, and gather information about their routes and activities. This information aids in enhancing situational awareness, improving safety measures, and facilitating efficient remote surveys and inspections in the maritime sector.

5.UNDERWATER IMAGERY

Underwater imagery is utilized in remote surveys and inspections in the shipping industry to visually assess the condition of ship hulls, propellers, and other submerged components. By using underwater cameras and imaging systems, inspectors can capture high-resolution images and videos of underwater areas without the need for divers or physical presence underwater. This technology enables detailed inspection of hull integrity, potential damage, marine growth, and other underwater structures, allowing for thorough assessments and timely maintenance planning to ensure the ship's operational efficiency and safety.

When performing remote inspections and surveys, it is crucial to take precautions to ensure effective and safe operations. Some precautions include:

1.Data Security.
2.Compliance with regulations and safety standards.
3.Regular maintenance of the inspection equipment.
4.Maintaining a clear and effective communication.

PROS & CONS:

PROS

- No need for physical attendance.
- Protection of employees' health by following the social distancing guidelines.
- Owners are taking full advantage of technology.
- Operators have easy access to the collected data and are able to create a maintenance plan that can predict the requirements of individual vessels.

CONS

- Connectivity to stream remains a challenge.
- Challenging to have a 360° view of the ship when the audit is remotely conducted.
- Attendance survey is still more efficient for periodical surveys since remote survey requires more preparation from crew and class and execution takes longer time.
- Survey with attendance will remain the preferred solution for complex and time-consuming surveys and older vessels.

CONCLUSION:

In summary, the implementation of remote inspections and surveys in the shipping industry has significantly enhanced operational efficiency and safety standards. Through the utilization of cutting-edge technologies like drones, AIS vessel tracking, and underwater imagery, these methods have revolutionized the way ship assessments are conducted, providing detailed insights from afar. By adhering to essential precautions such as data security, regulatory compliance, equipment maintenance, and effective communication protocols, remote inspections can be carried out meticulously and securely, contributing to improved maintenance practices and overall operational excellence within the maritime sector.

REFERENCES:

https://safety4sea.com/cm-remote-surveys-on-the-rise-pros-and-cons/

PIC SOURCE:INTERNET

PIC SOURCE:INTERNET

TECHNOLOGIES ON ADVANCED MANAGEMENT IN MARITIME INDUSTRY

BY
TAMAL CHANDRA DEY
(3RD YEAR, MRE)

Digitalization and automation are revolutionizing safety in shipping. Automation systems, artificial intelligence, and the Internet of Things (IoT) are being implemented to improve navigation, cargo handling, and emergency response. These technologies enable real-time monitoring, predictive maintenance, and optimized decision-making, reducing the risk of accidents and improving overall safety.

With new benefits the technologies also come with new risks such as technical failures, cyber security threats, potential errors or miscommunication between humans and automated systems, infrastructure limitations, etc.

Understanding these risks is crucial for maritime stakeholders to ensure safe, secure, and responsible adoption of these technologies. By acknowledging and addressing these challenges, the industry can harness the benefits of technological advancements while minimizing potential negative consequences.

AI & MACHINE LEARNING

Shipping goods is a fundamental aspect of the global economy, and the growing need of customers worldwide enforce constant optimization in this field. AI is changing the face of the maritime industry in three particular ways – by providing partial autonomy to the automatized units, evaluating processes and optimizing them, and forecasting future trends. Taking advantage of all these three opportunities is one of the methods to outperform the competition and reach sustainability goals. Still AI possess some specific risks such as increased use of AI can led to more cyber security risks to vessel and ports, job displacement for certain roles and poor data quality can led to inaccurate predictions and autonomous actions which may led to fatal accidents.

In recent years, ship efficiency improvements using Machine Learning (ML) methods are quickly progressing, facilitated by available data from remote sensing, experiments and high- fidelity simulations. The data have been successfully applied to extract intricate empirical rules that can reduce emissions thereby helping achieve green shipping.

AUTOMATIC IDENTIFICATION SYSTEM

An automatic Identification System (AIS) is an automated tracking system that displays other vessels in the vicinity. The broadcast transponder system operates in the VHF mobile maritime band.

The ship also shows the vessels in the vicinity on its screen, provided your vessel is fitted with AIS. If AIS is not fitted or not switched on, there is no exchange of information on ships via AIS.

The AIS onboard must be switched on at all times unless the Master deems that it must be turned off for security reasons or anything else. The working mode of AIS is continuous and autonomous.

LONG RANGE IDENTIFICATION AND TRACKING

The Long-Range Identification and Tracking (LRIT) system provides the global identification and tracking of ships to
enhance security of shipping and for the purposes of safety and marine environment protection.

The LRIT system consists of:

- The shipborne LRIT information transmitting equipment; The Communication Service Provider(s) (CPS);
- The Application Service Provider(s) (ASP);
- The LRIT Data Centre(s) (DC), including any related Vessel Monitoring System(s) (VMS);
- The LRIT Data Distribution Plan (DDP); and
- The International LRIT Data Exchange (IDE).

MARITIME SATELLITE COMMUNICATIONS (MSC) SYSTEMS

The development of Maritime Satellite Communications (MSC) systems for all type of commercial, military and inland sailing vessels since the 1970s. The main functions of MSC systems are to enhance the safety and security of seagoing vessels, mainly by alerting the Search and Rescue (SAR) operations, and to improve communication facilities between ships and shore infrastructures.

To overcome the disadvantages associated with HF/ VHF radio propagation and frequency locks, the International
Maritime Organization (IMO) in 1979 encouraged all member nations to establish Maritime Mobile Satellite Communication (MMSC) systems.

USE OF ALTERNATIVE RENEWABLE SOURCES

The shipping industry is increasingly adopting new sources to reduce its environmental impact such as wind assisted propulsion (use of sails and rotors or wings), LNG, LPG, Biofuels (derived from renewable sources like waste, algae or agricultural products), Hydrogen fuel cells, carbon capture and storage etc.

Being advantageous, use of alternative fuels comes with challenges such as high in costs than normal fuels, handling and storage risks, infrastructure risks (Inadequate bunkering infrastructure can led to huge loss), too much of dependence on technology (over reliance on complex technologies prone to failure) as well as technical challenges.

CONCLUSION

In conclusion, safety in shipping is being revolutionized by new and adapted technologies. The industry is embracing digitalization, automation, and sustainable propulsion to reduce risks and enhance safety. Advanced materials and designs, improved navigation and communication systems, and proactive safety management approaches are also being implemented.

PIC SOURCE:INTERNET

BY-ADITYA SHARMA(3RD YEAR, BNS)
& HARSH SINGH(3RD YEAR, BNS)

Implementing Digitalisation in Shipping: Challenges and Barriers

Digitalisation within the shipping industry has the potential to essentially move forward the oceanic security around the world. Be that as it may, the execution of computerized technologies by shipping companies isn't without its challenges.One boundary that has to be overcome is cybersecurity. As progressive and latest advances can be defenseless to cyberattacks, expanded security measures must be accomplished to evade attacks that might have genuine consequences. Data protection is another challenge that must be overcome for the effective digitalisation of the shipping industry. As the utilization of certain advances includes the collection and handling of individual information, personal information protection should put to on an edge, ensuring best honesty is observed. Equally, the general results of executing sea innovations can moreover be an obstruction for a few shipping companies to get to all computerized technologies.

Unveiling the Benefits of Digitalisation for Shipping Safety:

For shipping companies who can get to an established computerized arrangements, there are a few critical benefits for general sea safety. The utilize of AI in shipping (Fake insights) implies that frameworks to identify and avoid the risks of collisions are being created. AI integration in shipping can also be utilized to screen the effectiveness of a ship's frameworks and caution the group to potential issues that recently may have ended up as dangerous for the ships. Similarly, enormous information can be utilized to recognize patterns, such as climate designs in certain zones. This data can at that point be utilized to figure out the chance of storms, allowing shipping courses or plans to be modified. Huge information can also be utilized to track the execution of ship's passage plan and to distinguish ranges where security advancements can be made more reliable and secured ensuring large security onboard. Another good thing about digitalisation is the utilization of blockchain in shipping, which can offer assistance to track the proper handling of cargo. This may offer assistance to anticipate any piracy or extortion and to improve the transparency of the supply chain. Blockchain can moreover be utilized to store and share security information, such as support records and occurrence reports, reducing the chance of information breaches.

PIC SOURCE:INTERNET

The points of interest of digitalisation within the shipping industry have amplified past the ships themselves. Further checking can be used on shore to screen the condition of ships and their gears, assuring that issues can be distinguished early on, and remedial actions can be taken some time, when recently a major ocurrence has taken place. Further checking can moreover be utilized to supply support to the team by giving climate upgrades or specialized assistance. Equally virtual reality (VR) and expanded reality (AR) can be utilized with teams preparing to mimic unsafe circumstances and progress security mindfulness and aptitudes. VR and AR can also be utilized to examine ships and hardware, once more empowering potential issues to be recognized and corrected early on.

Some extra benefits of digitalisation in oceanic security, moreover, include:

- Automating certain sectors of job to make pace in the group productivity and empower them to center on other tasks.
- Real-time, upgraded situational awareness in the ship's environment (climate conditions, activity thickness, and cargo loading).
- Improved decision-making by giving the team to get more informations by mimicking distinctive scenarios.

Digitalisation in shipping, moreover, has a positive natural effect. Not as it were businesses that decrease their paper utilization, but by advancing shipping courses, companies can diminish their general fuel utilization and greenhouse gas emissions. This exertion towards assuring feasible shipping may involve determining and taking actions making a difference to set them separated from their competition.

With so numerous businesses grasping the utilization of innovation, companies that are progressing quickly must adjust to modern controls. Hence, the progress will be able to offer more imaginative growth than other businesses in their segment, making a difference to them and stand out from the crowd.

However, Adaption to the digitalisation in shipping industry also brings some threats to the industry and shipping companies.

Some of the major threats to the industry are discussed below:

CYBERSECURITY RISKS:

Vulnerable to Attacks: As the maritime industry becomes more interconnected and reliant on computers, software and Internet connections as it uses technology, this unfortunately opens up new avenues for cyberattacks. Implementing strong cybersecurity measures is critical to protecting against data breaches, ransomware and other threats. This challenge increases the risk of cyber incidents due to thevulnerabilities of many network site.

OPERATIONAL DISRUPTIONS:

Dependency on Technology: Over-reliance on digital technology means that disruption (operational failure, downtime or malfunction) can cause interference. To mitigate this risk, it is essential to ensure redundancy and backup plans. Appropriate training and procedures are required to mitigate this risk.

DATA PRIVACY AND COMPLIANCE:

Handling Sensitive Data: Digitization involves the collection and processing of large amounts of data. Ensuring compliance with privacy regulations such as GDPR and protecting sensitive data is essential. It is important to be aware of changing policies and adjust practices accordingly

CONCLUSION:

Ultimately, the computerized change within the shipping industry brings a multitude of benefits. From progressive productivity to expanded security and client fulfillment, the longer term of shipping depends on the embracement of sea innovation. Although, we first need to adapt to the risk and conduct a thorough risk assessment to determine all kinds of threats associated with the digitalisation of shipping industry before becoming reliant on these technologies and must not forget that this is not something to fully rely upon as the humans still have an upper hand on these technologies as they have the ability to think and handle the situations effectively by taking appropriate decisions at the correct time..

SAFETY AT SEA: EMBRACING NEW TECHNOLOGIES IN MARITIME SHIPPING

Shipping is vital for global trade, moving tons of cargo through oceans yearly. The maritime sector encounters various safety issues. Safety in shipping is crucial for not only for human life, cargo protection, and environmental preservation also. The maritime shipping industry, a cornerstone of global trade, is undergoing a profound technological transformation aimed at enhancing safety, efficiency, and environmental sustainability. As vessels navigate increasingly complex routes and face evolving challenges, from extreme weather events to cybersecurity threats, new technologies are being adapted to address critical safety concerns and revolutionize operations at sea.

PIC SOURCE:INTERNET

BY- BINET KUMAR MISHRA
MRE (2020-2024)

AUTONOMOUS AND REMOTE-CONTROLLED SHIPS:

One of the most significant advancements in maritime technology is the development of autonomous and remote-controlled vessels. These ships, equipped with advanced AI-driven navigation systems, promise to reduce human error, which accounts for a significant portion of maritime accidents. By integrating machine learning algorithms with sensor data, these vessels can make split-second decisions to avoid collisions and navigate treacherous waters. However, the implementation of autonomous ships also brings new challenges, particularly in cybersecurity and the need for updated regulatory frameworks to govern their operation in international waters.

ADVANCED WEATHER ROUTING:

Climate change has intensified the need for sophisticated weather routing systems. Modern ships now utilize real-time data analysis and predictive modelling to plan optimal routes, considering factors such as wind patterns, wave heights, and ocean currents. This technology not only enhances safety by helping ships avoid severe weather conditions but also improves fuel efficiency and reduces environmental impact. Advanced weather routing systems contribute to safer voyages for crew and cargo while aligning with global efforts to reduce the shipping industry's carbon footprint.

INTERNET OF THINGS (IOT) AND PREDICTIVE MAINTENANCE:

The integration of IoT devices on ships has revolutionized maintenance practices. Sensors continuously monitor critical systems and components, collecting data on performance and wear.This information is analysed using sophisticated algorithms to

predict potential failures before they occur. Predictive maintenance not only reduces the risk of catastrophic failures at sea but also optimizes maintenance schedules, reducing downtime and improving overallvessel reliability. The result is a safer, more efficient fleet that can operate with greater confidence in challenging conditions.

VIRTUAL AND AUGMENTED REALITY FOR TRAINING:

Safety at sea begins with comprehensive training, and VR and AR technologies are transforming how crews prepare for emergencies. These immersive technologies allow for the simulation of complex scenarios, from engine room fires to man-overboard situations, in a safe, controlled environment. Crew members can practice their responses repeatedly, improving muscle memory and decision-making skills without the risks associated with live drills. This innovative approach to training has shown to significantly improve crew preparedness and response times in real emergencies.

BLOCKCHAIN FOR SUPPLY CHAIN TRANSPARENCY:

While primarily known for its applications in finance, blockchain technology is finding a crucial role in maritime safety and security. By creating an immutable, transparent record of cargo and vessel movements, blockchain enhances the traceability of goods and reduces the risk of fraud. This technology also streamlines customs processes and port operations, reducing delays and the potential for human error in documentation. The improved transparency and efficiency contribute to a safer, more secure global shipping network.

DRONE TECHNOLOGY FOR INSPECTIONS AND SURVEYS:

The use of drones for ship inspections and surveys represents a significant leap forward in maritime safety practices. Drones can access hard-to-reach areas of a vessel, performing visual inspections without putting human surveyors at risk. This is particularly valuable for assessing damage in hazardous environments or conducting routine hull inspections. Drones equipped with high-resolution cameras and sensors can provide detailed imagery and data, allowing for more accurate and timely assessments of a ship's condition.

PIC SOURCE:INTERNET

SATELLITE COMMUNICATION AND CONNECTIVITY:

Enhanced satellite communication systems have dramatically improved safety at sea by ensuring constant connectivity between ships and shore-based support. Real-time communication allows for immediate response to emergencies, access to critical weather updates, and improved navigation support.

Moreover, reliable internet access contributes to crew welfare, reducing the isolation often associated with long voyages and improving mental health outcomes for seafarers. Cybersecurity and system reliability risks in autonomous and remotely operated ships utilizing AI, IoT, and blockchain technologies are intricate and interconnected. Vulnerabilities in cybersecurity encompass activities such as hacking, data alteration, and malware infections, which have the potential to jeopardize ship control systems or sensitive data. Concerns regarding system reliability arise from the possibility of errors in AI decision-making, failures in sensors, and disruptions in blockchain networks. These risks are further heightened by the intricate fusion of multiple technologies within demanding maritime scenarios. Mitigating these challenges necessitates the implementation of robust security protocols, the integration of redundant systems, and the continuous monitoring of operations. The consequences of these risks can range from interruptions in operations to severe safety risks, emphasizing the imperative need for holistic risk management strategies in this dynamic maritime technological landscape.

In conclusion, the convergence of AI, IoT, blockchain, and other cutting-edge technologies is ushering in a new era of maritime safety. As these systems become more sophisticated and widely adopted, they promise to significantly reduce accidents, improve operational efficiency, and enhance the overall resilience of the global shipping industry. The journey towards safer seas is ongoing, driven by innovation and a collective commitment to protecting lives, assets, and the marine environment.

PIC SOURCE:INTERNET

SHIP SAFETY

Adaptive Technology and The Danger of Human Error in Ship Operations

PIC SOURCE: INTERNET

BY CAPT. S C SAHA
BNS FACULTY

INTRODUCTION:

Shipping plays a critical role in the global economy, Safety in maritime operations is paramount due to the potential consequences of accidents, which can include loss of life, environmental pollution, and significant financial losses. Innovations in technology have significantly enhanced ship safety, reducing the risk of accidents, improving operational efficiency, and protecting human lives and the environment. But still, the danger posed by human error in ship operations of is a crucial factor.

BENEFITS OF ADAPTED TECHNOLOGIES

1. Enhanced Situational Awareness: Technologies like ECDIS and AIS provide real-time data, improving decision-making and reducing the risk of collisions. 2. Reduced Human Error: Automation and AI reduce reliance on human operators, minimizing the risk of mistakes.

3. Improved Emergency Response: Advanced communication systems ensure rapid and effective response to emergencies.
4. Proactive Maintenance: Predictive maintenance prevents equipment failures, ensuring continuous safe operations.

ADVANCES IN MARITIME SAFETY TECHNOLOGY

1. Navigation and Collision Avoidance
Electronic Chart Display and Information System (ECDIS): Provides real-time navigation information and digital charts, enhancing situational awareness and reducing navigational errors.

- Automatic Identification System (AIS): Allows ships to communicate their position, speed, and course to other vessels and shore stations, improving collision avoidance.
- Integrated Bridge Systems (IBS): Integrates various navigation and control systems into a single interface, simplifying operations and reducing the risk of human error. 5. Environmental Protection Technologies
- Ballast Water Management Systems: Treats ballast water to prevent the spread of invasive species.
- Emission Control Technologies: Reduces the emission of harmful pollutants, ensuring compliance with environmental regulations.
- Environmental Protection: Technologies for ballast water management and emission control help protect marine ecosystems.

PIC SOURCE: INTERNET

TYPES OF HUMAN ERRORS

1. Operational Errors: Mistakes made during the operation of the vessel, such as navigational errors, improper handling of machinery, and failure to follow standard operating procedures.
2. Decision-Making Errors: Poor judgment or decisions made under pressure, often due to inadequate training, lack of experience, or miscommunication.
3. Skill-Based Errors: Errors occurring due to lapses in routine tasks or lack of skill, such as improper execution of maneuvers.
4. Perceptual Errors: Misinterpretation of information or signals, which can lead to incorrect actions being taken.

CAUSES OF HUMAN ERRORS

1. Fatigue: Long working hours, insufficient rest, and stressful working conditions can lead to fatigue, impairing judgment and performance.
2. Inadequate Training: Lack of proper training and continuous education can leave crew members ill-prepared to handle emergencies or complex operations.
3. Poor Communication: Miscommunication among crew members, or between the ship and shore-based personnel, can lead to critical errors.
4. Automation Dependency: Over-reliance on automated systems can result in complacency and reduced situational awareness.
5. Stress and Pressure: Working under high-pressure conditions, such as tight schedules or adverse weather, can lead to errors in judgment.

STRATEGIES FOR ENHANCING SHIP SAFETY

1. **Training and Education**

- Comprehensive Training Programs: Regular and rigorous training programs to ensure crew members are well-versed in operational procedures and emergency response. Continuous Professional Development:Ongoing training and certification
- to keep crew members updated with the latest safety practices and technologies.

2. **Fatigue Management**

- Work-Rest Schedules: Implementing work-rest schedules that comply with international regulations to ensure adequate rest for crew members.
- Monitoring Fatigue Levels: Using technology and monitoring systems to assess fatigue levels and prevent overworking.

3. **Improved Communication**

- Standardized Communication Protocols: Establishing clear and standardized communication protocols to minimize misunderstandings.
- Use of Technology: Utilizing communication technologies to enhance information exchange between ship and shore.

4. **Automation and Technology**

- Advanced Navigation Systems: Implementing advanced navigation systems to assist in decision-making and reduce the likelihood of human error.
- Automation with Human Oversight: Balancing automation with human oversight to ensure that crew members remain engaged and aware of the operational status.

CONCLUSION

The integration of new technologies in shipping has significantly enhanced safety, reduced human error, and improved operational efficiency. While challenges remain, the benefits of adopting these technologies far outweigh the drawbacks. Continuous innovation and investment in maritime safety technologies are essential for ensuring the safety of seafarers, protecting the environment, and maintaining the economic stability of global trade.

SUSTAINABLE AND SAFE MARINE ENGINE OPERATION WITH ALTERNATIVE FUELS

By-Debjit Khanra , Amit Kumar Pal ,
& Yadav Khamrui (MRE-4 th Year)

INTRODUCTION-

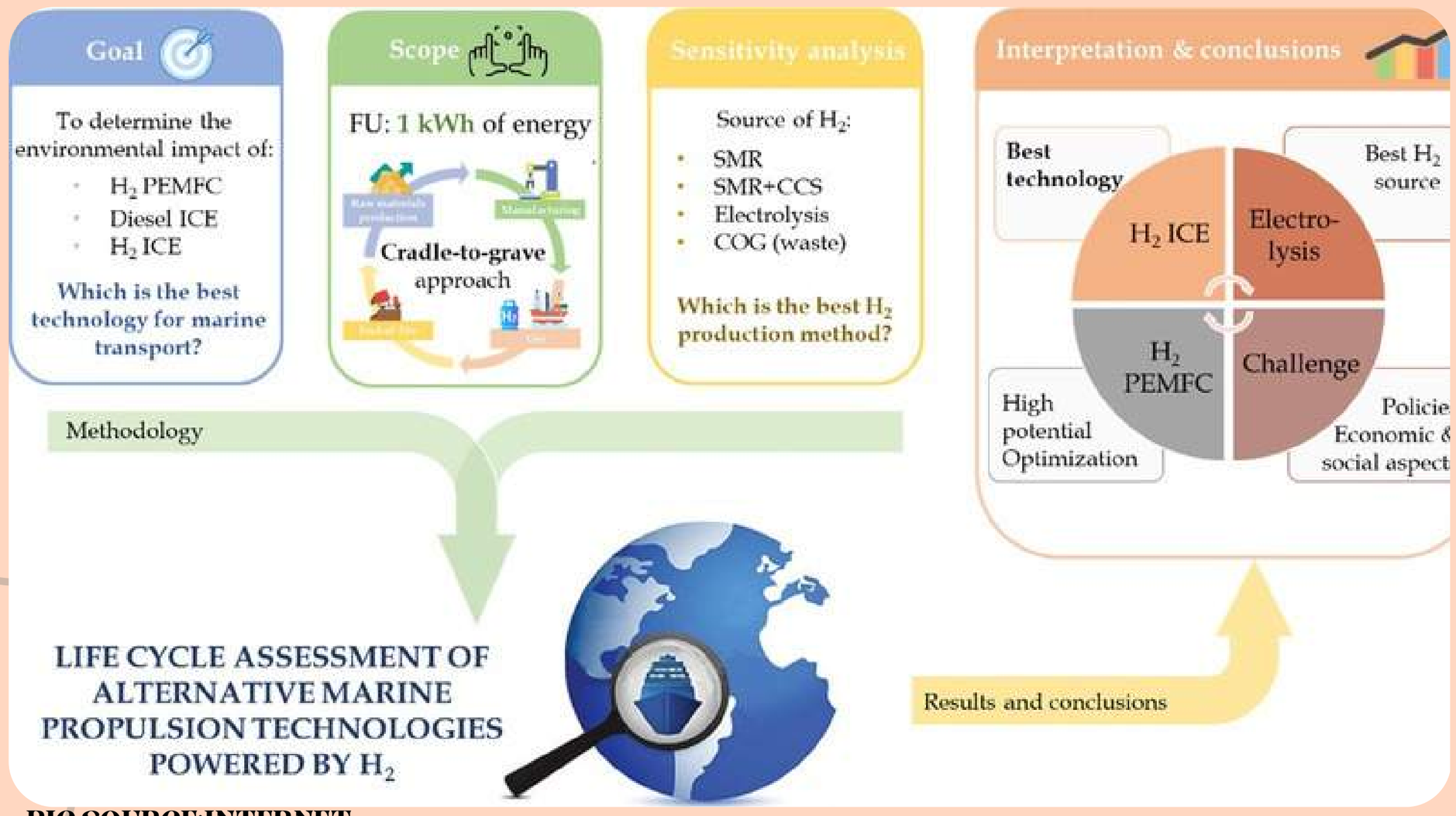
With 80% of the global trade volume being transported via maritime vessels, the maritime sector is widely recognized for its significance in the realm of international trade and consequently, the economy. The importance of ensuring shipping sustainability has been well established in facilitating economic development and has garnered substantial attention in recent times. It is understood that marine engines play a critical role by providing both propulsion and auxiliary power to ships, while also being accountable for the emission of greenhouse gases (GHG) and non-GHG substances into the atmosphere. Thus, the primary objective of this investigation is to undertake an exhaustive review of literature focusing on the performance and emission attributes of marine engines fueled by hydrogen, ammonia, and methanol. The key features of these alternative fuels, along with their ecological impact, operational feasibility, storage prerequisites, and economic considerations, are comprehensively evaluated for comparative purposes. Evolution in alternative fuels use- This section examines recent advancements in alternative fuels utilized in compression-ignition internal combustion engines, which are predominantly utilized in the maritime industry. The subsequent subsections discuss the fuels analyzed in the research, specifically hydrogen, ammonia, and methanol.

➢ METHANOL-

Methanol is a commonly manufactured chemical and fuel that is progressing towards environmentally friendly production, offering a potential solution to the decarbonization obstacles encountered by proprietors and operators. Methanol shows potential as a marine fuel owing to its capability to lower industry emissions, its well-established handling and shipping facilities, and its compatibility with current ship engine technology.

➢ AMMONIA-

Ammonia is among several potential fuels under evaluation, including nuclear, hydrogen, LNG, biofuels, and others. Ammonia presents the opportunity for propulsion with near-zero carbon emissions, as its combustion does not release any carbon dioxide (CO2), although it necessitates minor CO2 emissions for pilot fuel combustion.



PIC SOURCE:INTERNET

➢ HYDROGEN-

The relevant literature delves into the study of hydrogen's behavior in compression-ignition and dual-fuel engines. Owing to its elevated autoignition temperature of 800 K, hydrogen is predominantly employed in conjunction with diesel in dual-fuel combustion.
Safety assessment of use alternative fuels -
The safety implications surrounding the utilization of alternative fuels in ship power plants and marine engines constitute a crucial aspect. This pertains to enhancing the dependability of the basic system being studied, all the while mitigating the impacts of potential outcomes to guarantee that the system upholds a satisfactory safety standard. Conversely, within more intricate systems, heightened reliability does not inherently equate to enhanced safety.

❑ SAFETY ASSESSMENT OF METHANOL-

Methanol exhibits similarities to the fossil fuels utilized in marine engines, such as diesel fuels; hence, there is a possibility that fire and explosion safety measures may need to be alike. The notably elevated auto-ignition temperature of methanol serves to diminish the potential hazards associated with self-ignition or explosion. Additionally, when methanol comes into contact with certain materials, it has the potential to cause corrosion, and human exposure to methanol can result in significant health complications.

❑ SAFETY ASSESSMENT OF AMMONIA-

Ammonia possesses a more restricted flammability range; nevertheless, it exhibits high reactivity. It is imperative to store it away from potential sources of ignition and various chemicals. The substance undergoes violent reactions with halogens, interhalogens, and oxidizers, resulting in explosive outcomes. The release of ammonia has the potential to give rise to scenarios involving elevated levels of toxicity and corrosiveness, thereby increasing the likelihood of an explosion. Despite this, the risk of fire is deemed to be lower compared to other types of fuels. Ammonia features a notably high auto-ignition temperature, which may result in combustion instability or the release of unburned ammonia during operation at low engine loads and high engine speeds, consequently posing potential implications for engine performance.

❑ SAFETY ASSESSMENT OF HYDROGEN-

Hydrogen represents a type of fuel distinguished by its high flammability. Consequently, the occurrence of leaks has the potential to generate either an explosive environment or fire risks, particularly within the confined areas of the engine room. In order to mitigate these risks, it is imperative to implement appropriate safety protocols, such as effective gas handling, adequate ventilation, hydrogen gas monitoring, fire detection systems, and alarm mechanisms. In relation to the combustion of hydrogen, its elevated octane rating and auto-ignition temperature have the capacity to engender safety concerns.
Preventing risk of Alternative fuel :-

1. PROPER FAILSAFES AND INSPECTIONS:

Regular examinations of fuel storage systems, pipelines, and apparatus are essential for both methanol and ammonia in order to detect possible leaks or weaknesses. Such protocols provide a strong safeguard against leaks and facilitate prompt intervention strategies .

2. AUTOMATED SHUTDOWN MECHANISMS :

Automated shutdown mechanisms have proven to be efficient in promptly addressing unforeseen discharges of both methanol and ammonia. The utilization of such mechanisms plays a crucial role in averting additional spillage and reducing potential hazards, thereby bolstering the protection of personnel and the surrounding ecosystem .

3. EFFECTIVE VENTILATION SYSTEMS:

Ventilation systems play a crucial role in ensuring safety for both methanol and ammonia, being equally essential for both substances. In areas with limited space like engine room bilges, the presence of adequate ventilation is vital to effectively disperse vapors, thus safeguarding crew members from potential harm. This function is paramount in reducing the likelihood of exposure risks and maintaining the overall safety of the crew. Conclusion : The use of alternative fuels with fuel preservation involves addressing technical, economic, and operational challenges while leveraging the benefits of these fuels for environmental sustainability and regulatory compliance. Balancing these factors requires a strategic approach that considers both immediate and long-term implications.

LITERARY CONTENT

Friendship

Well! It's the most coveted one,
Which must be preserved and remembered by everyone.
It's a bond that makes you a person,
It's a bond which helps you in every fashion.
It's a bond where you share your lightest of feelings,
And also your heart broken ones which requires a healing.
It's a bond which makes you giggle,
even without any tickle.
It's a bond which makes you cry,
Just when the Chemistry between starts to dry.
Respect the person with whom you have this,
Or else you will be in depression as per my statistics.
So I can go on writing on this one,
Because it's a relationship which is a never ending one.
Nevertheless, it's a relationship to be cherished,
And with Friends and Friendship everyone's life must be carried...

-PRATYAY SARKAR
(3RD YEAR, MRE)

LIFE

-RITTIK SINGH (2ND YEAR, MRE)

Life is a mysterious and wondrous journey that is full of twists and turns.It is a journey that takes us through ups and downs, highs and lows, and yet, it is a journey that is uniquely our own. From the moment we are born, we begin to experience the world around us. We learn to navigate its complexities, to understand its beauty, and to find our place within it. We form connections with others, we build relationships, and we create memories that last a lifetime.

But life is not without its challenges. We face obstacles, we encounter setbacks, and we must learn to overcome them. We must learn to be resilient, to adapt, and to grow. And it is through these challenges that we discover our strength, our courage, and our determination.

Despite its difficulties, life is also full of joy, love, and wonder. We experience moments of pure happiness, of deep connection, and of profound beauty. We find joy in the simple things, in the beauty of nature, in the laughter of children, and in the love of those around us.

As we journey through life, we must remember to cherish every moment, to appreciate every experience, and to never take anything for granted. We must learn to live in the present, to embrace the unknown, and to trust in the journey.

In the end, life is a gift, a precious and fragile gift that we must cherish and honor. It is a journey that is uniquely our own, a journey that is full of wonder, joy, and beauty. And it is up to us to make the most of it, to live it fully, and to cherish every moment.

THE SAILOR'S LIFE

The sailors set sail on the open sea,Their hearts full of hope, their spirits free. With every wave, a story's told, Of adventures had, and tales to hold.

Their journeys long, their days hard won, They brave the elements, beneath the sun.Through stormy nights, they stand as one, Their bond unbroken, like the morning sun.

With salty hair, and weathered skin, They ride the tides, where seagulls spin. Their laughter echoes, across the blue, As they chart their course, with a heart anew.

Their ships a home, their crew a family, Together they roam, wild and carefree.The sailors' life, a life of the sea, A life of freedom, wild and carefree.

-Sami alam Siddiqui
(2ND YEAR, BNS)

THE RESPONSIBILITIES THE SAILORS HOLD TO MAINTAIN THE GLOBAL ECONOMY.

-BHUPATI KIRAN KUMAR(2ND YEAR, BNS)

Sailors have long been the backbone of global maritime endeavours, significantly contributing to the world through various roles and responsibilities.

From facilitating international trade to protecting marine ecosystems, the impact of sailors on society is profound and multifaceted. This essay explores the various ways in which sailors give back to the world, highlighting their indispensable contributions. Facilitating Global Trade and TransportationOne of the most significant contributions of sailors is their role in global trade and transportation.

The vast majority of international trade is conducted via sea routes, with sailors ensuring the safe and efficient transport of goods across the world's oceans.

By manning cargo ships, tankers, and container vessels, sailors help to sustain the global economy, ensuring that raw materials, manufactured goods, and essential commodities reach their destinations. This continuous flow of trade supports economies, creates jobs, and enables the exchange of cultural and technological advancements.Search and Rescue OperationsSailors are often at the forefront of search and rescue operations, providing critical assistance to those in distress at sea. Coast guard units and naval forces worldwide are staffed by skilled sailors who risk their lives to save others. These brave individuals conduct rescue missions in treacherous conditions, offering hope and safety to stranded or imperilled mariners. Their efforts not only save lives but also exemplify the spirit of solidarity and humanity that transcends national boundaries. Advancing Scientific Research The

contributions of sailors to scientific research are invaluable. Oceanographic research vessels, often crewed by sailors, play a crucial role in exploring and understanding marine environments. These ships are equipped with sophisticated instruments and technology, enabling scientists to study ocean currents, marine life, and underwater geology. The data collected by these expeditions is vital for understanding climate change, predicting weather patterns, and protecting marine biodiversity. Sailors, therefore, play a key role in advancing our knowledge of the planet's oceans and their impact on the global ecosystem. Ensuring National and International Security Sailors serving in naval forces are integral to maintaining national and international security. They protect maritime borders, deter piracy, and safeguard shipping lanes, ensuring the safe passage of vessels. In times of conflict, naval forces are essential in projecting power, providing humanitarian aid, and conducting peacekeeping missions. By maintaining a strong naval presence, sailors contribute to global stability and security, fostering an environment where trade and diplomacy can flourish. Promoting Environmental Stewardship in recent years, the role of sailors in environmental stewardship has become increasingly important.Many sailors are involved in efforts to combat marine pollution, protect endangered species, and preserve fragile ecosystems.They participate in initiatives to reduce plastic waste, prevent oil spills, and promote sustainable fishing practices. Additionally, sailors often support research and conservation projects aimed at understanding and mitigating the impacts of climate change on marine environments. Through these efforts, sailors help to ensure the health and sustainability of the world's oceans for future generations.Cultural Exchange and DiplomacySailors also contribute to cultural exchange and diplomacy.As they travel to different port around

the world, interact with diverse cultures and communities, fostering mutual understanding and respect. These interactions can lead to stronger international relationships and collaborations. Naval ships often serve as ambassadors of goodwill, participating in joint exercises, humanitarian missions, and diplomatic visits, thereby enhancing international cooperation and peace. Conclusion in conclusion, sailors give back to the world in numerous and significant ways. Their contributions to global trade, search and rescue operations, scientific research, national security, environmental stewardship, and cultural exchange are invaluable. Sailors embody the spirit of adventure, resilience, and service, making the world a safer, more connected, and better-understood place. As we navigate the challenges of the 21st century, the role of sailors will remain crucial in shaping a sustainable and prosperous future for all.

LEADERSHIP MOTIVATION: A GUIDE TO CULTIVATING BETTER LEADERS

CAPT. SUBHRAJIT CHAKRABORTY.
HOD- NAUTICAL DEPT. (BNS).

There's more to motivating performance than offering competitive pay and benefits. Employees are inspired or deflated by how their organizational leaders treat them. To improve performance, you need to understand why leadership motivation matters and how your managers can get better at it.

Great leaders don't just manage; they also motivate, inspire, and influence employees to be their best. Cultivate these traits and behaviors to build leadership motivation in your workforce.

THE DIFFERENCE BETWEEN A MANAGER AND A LEADER

The difference between a manager and a leader is about leadership quality and the scope of their responsibility. Managers oversee work to ensure it's completed on time and within the budget. They won't always put extra effort into relationship building or other factors that inspire the team to perform better.

On the other hand, leaders tend to view their teams with a wider lens. A leader is someone who team members want to follow. Employees trust leaders to take them in the right direction and provide support along the journey. Leaders are passionate about their work, care about their employees, and strive to create the best possible outcomes.

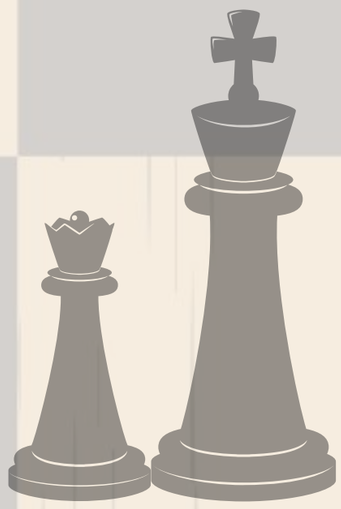
LEADERS INSPIRE INTRINSIC MOTIVATION

Managers can use extrinsic factors such as compensation or extra time off to motivate their teams. Leaders take a different approach: Instead of relying only on extrinsic motivation, they also inspire employees to see the work as its reward.

Leaders might encourage employees to work harder as a way to support their colleagues or extend themselves beyond their comfort level to accomplish big goals. Or, intrinsic motivation might come from the satisfaction of achievement. Recognition and praise from leaders can also inspire confidence and pride while motivating employees to accomplish their goals.

LEADERS CONVEY A SENSE OF PURPOSE AND OWNERSHIP

Managers support employees as they work toward their performance goals, but leaders go further and foster alignment between employee goals and business goals. This gives employees greater purpose by helping them see their role in producing business results. That sense of purpose and ownership can be a powerful intrinsic motivator. Employees who understand how their work factors into final results are more engaged and satisfied with their daily activity list.



-:CAMPUS REPORT:-

JANUARY

Celebration of 75th Republic Day

Champions in “Futsal ”

FEBRUARY

Celebration of Saraswati Puja

Celebration of Mother Language Day

Convocation 2024

MARCH

Annual Athletics Meet

Intra-college Basketball tournament

Inspection by Directorate General of Shipping

Celebration of Maritime Day at M.M.D. ,Kolkata

APRIL

Celebration of Maritime Day at The Neotia University

SHIP VISIT 2024

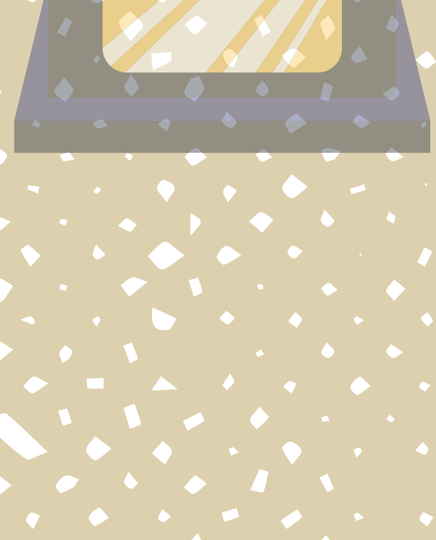
MAY

Workshop on “Maritime Cyber Security and Resilience”

Celebration of International Yoga Day

AWARDS

SOMALI MUNSHI,
A 2ND YEAR MRE CADET,
WAS AWARDED THE 2ND PRIZE IN THE ESSAY COMPETITION HELD AT MMD, KOLKATA ON MARCH 31ST, 2024.



PLACEMENTS

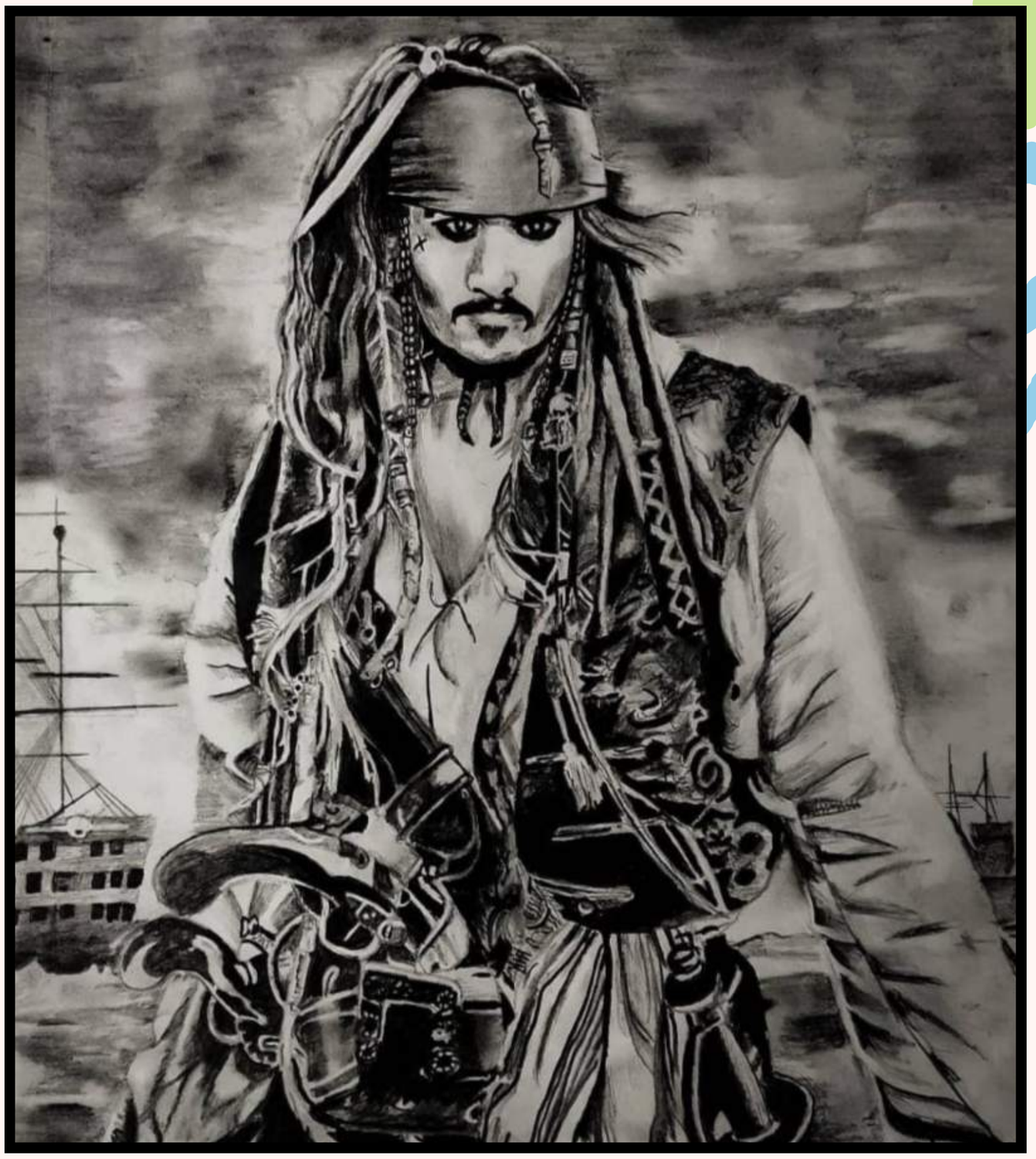
NAJIB AHMED
(3RD YR. MRE)

BINEET KR. MISHRA
(4TH YR. MRE)

SUDIP ADGIRI
(2ND YR. BNS)

DEBADRITA SARDAR
(3RD YEAR, BNS)

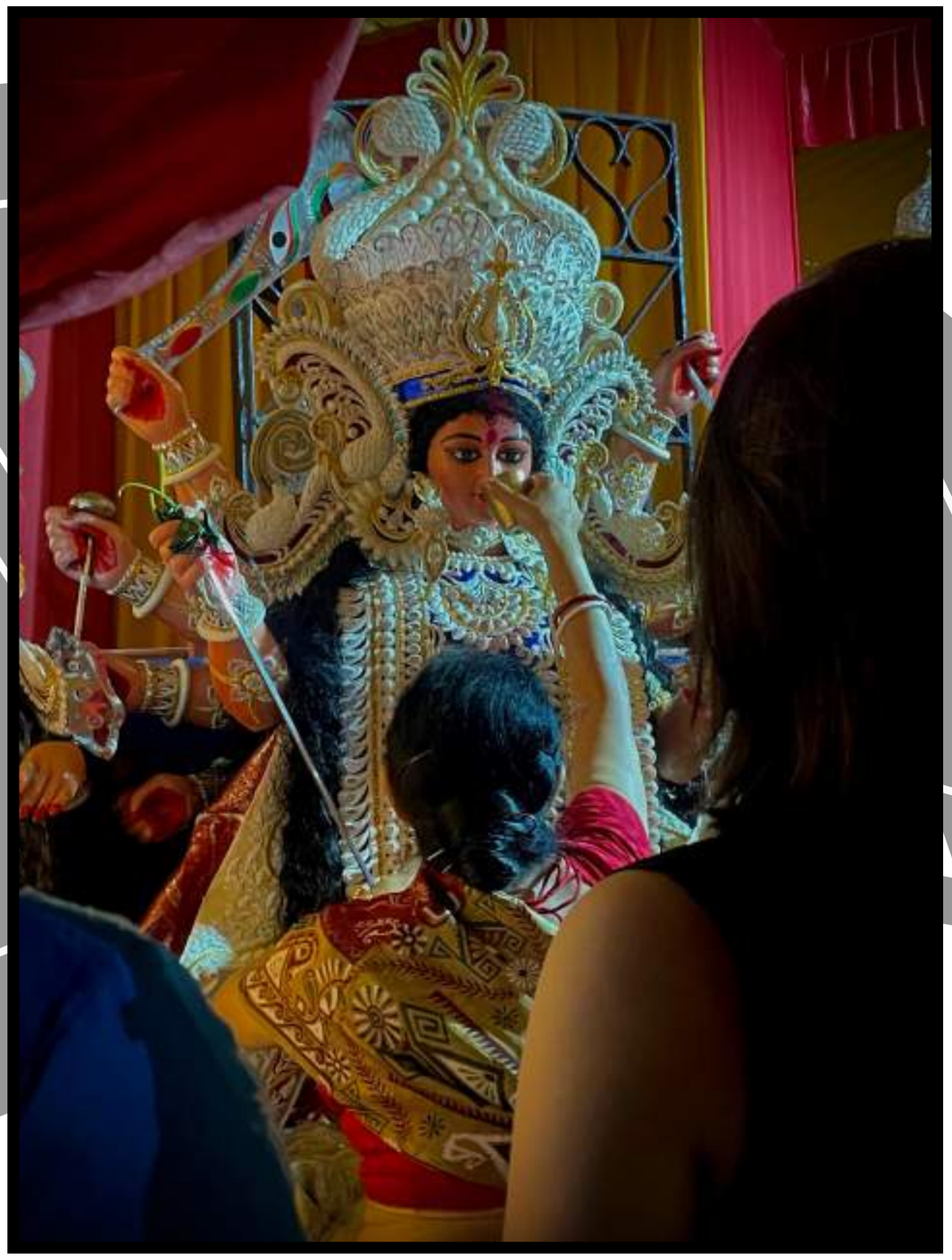
TAMAL CHANDRA DEY
(3RD YEAR, MRE)



KUNAL MAJUMDAR
(2ND YEAR, BNS)

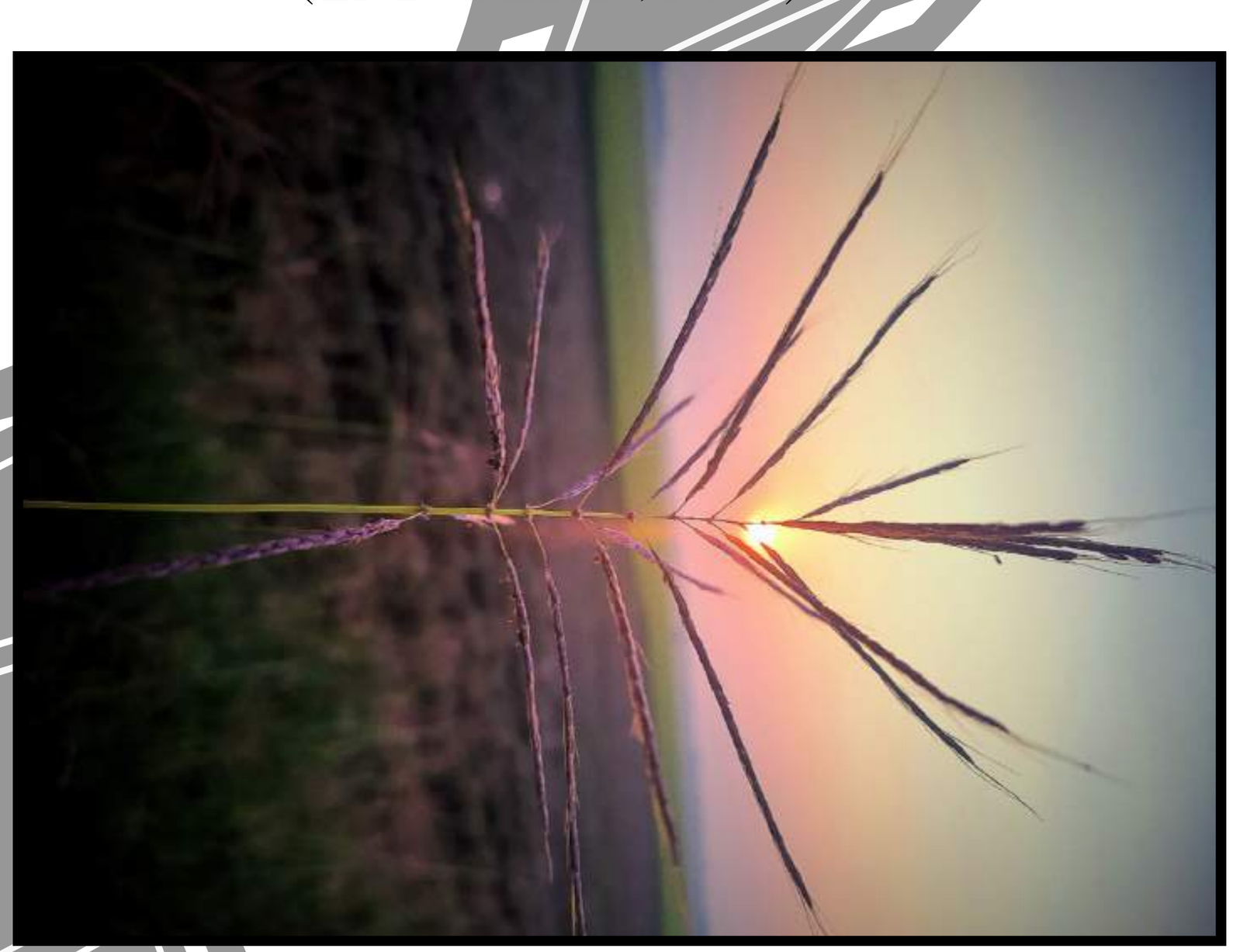
FROM LENS OF SOMS

PRATYAY SARKAR
(3RD YEAR, MRE)



RISHAV MUKHERJEE
(3RD YEAR, MRE)

GUNJAN MONDAL
(3RD YEAR, MRE)



ANIRBAN PAL
(2ND YEAR, BNS)

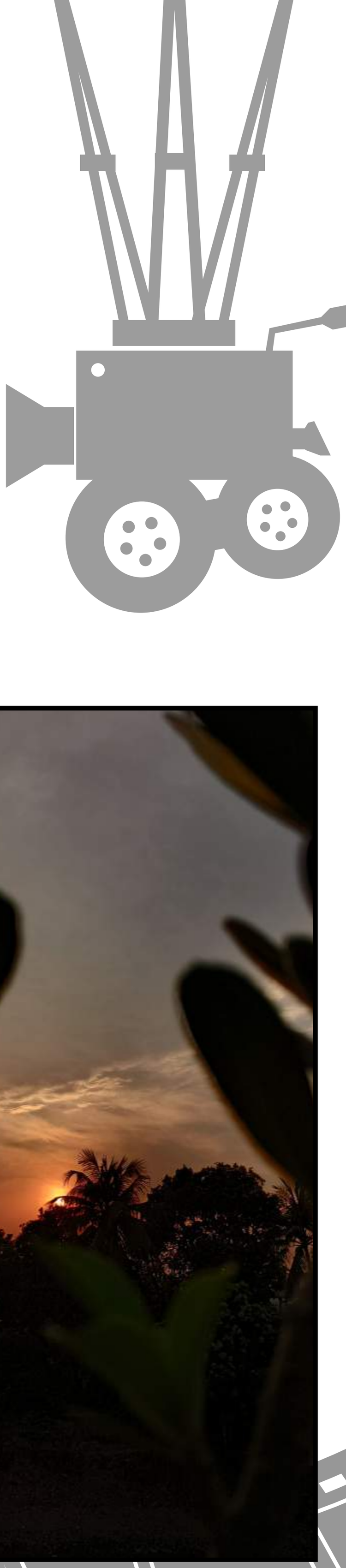
SWAGATA SASMAL
(2ND YEAR, BNS)

SAMI ALAM SIDDDIQUI

(2ND YEAR, BNS)

KRISHNENDU NAIYA

(3RD YEAR, MRE)



MR. SUBIR BASU
(MRE FACULTY)

OUR STRENGTH OUR FAMILY

THE FEW THE PROUD

4TH YR MRE(2021-2025)

3RD YR MRE(2022-2026)

2ND YR BNS(2023-2026)

2ND YR MRE(2023-2027)

3RD YR BNS(2022-2025)

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. GIRL'S HOSTEL - 3 (G + II)

E. UTILITY & SERVICES BLOCK

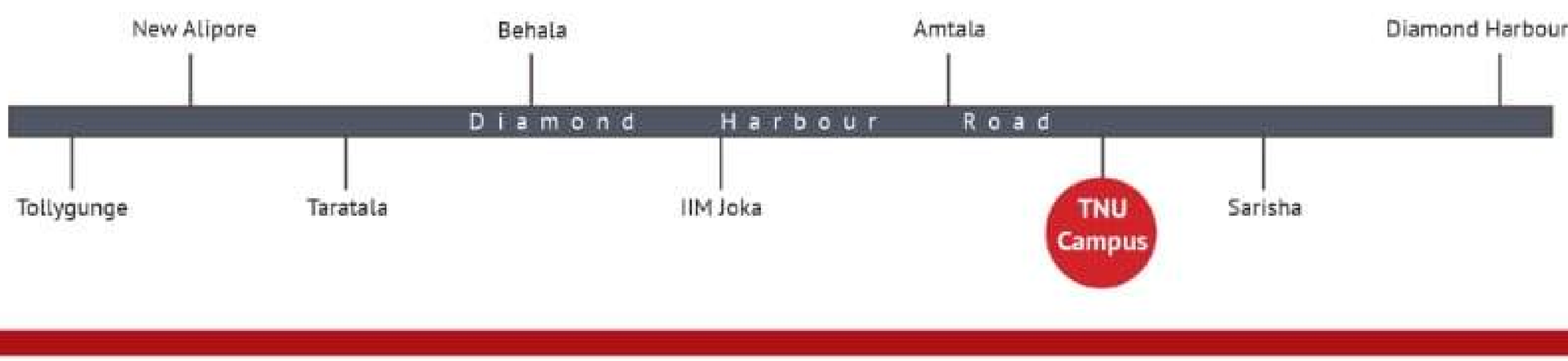
43. ELECTRICAL ROOM
44. PUMP ROOM

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

ज्ञानम् आत्म प्रदीपाय

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