

GREENER SHIPPING

ACADEMIC AND CAMPUS DIARY



Academic and campus e-magazine that contains dozens of very interesting stuff for you to know about us and our achievements



Foreword from VC



The e-magazine 'ABHIJAN' will not only contain the essence of exploration in sea but also some other articles to enlighten other aspects those are integrated in our life. In this introductory note or foreword, I like to congratulate the community of our School of Maritime Studies for their great initiatives in publishing this e-magazine 'ABHIJAN' and it is expected that this will appear in every quarter of the year.

Dr. Biswajit Ghosh

Vice Chancellor
The Neotia University



It is a great privilege for me to write an introductory note or foreword in the first issue of the e-magazine 'ABHIJAN' of our School of Maritime Studies. The word ABHIJAN is the venture for exploring the unknown space which contains lots of risks and threats but nevertheless, human mind ventures to the unknown place to know and to feel what truth is. The students enter our Marine Engineering (MRE) and Nautical Science (BNS) programme to be a possible seafarer. The seafarer starts their professional journey in the deep sea around the globe. During this time, they are trained to feel what abhijan or exploration is. Our faculty members train them how to adjust themselves in their professional activities while exploring in rough and tough situations in their long-term voyages.

Life on voyages is tough and often dangerous for seafarers who very often have to face extreme weather conditions, particularly during the cold winter months. With the advancement of technologies and emergence of internet communication technology (ICT) living conditions have improved over the years, but some uncertainties still exist.

We expect that 'ABHIJAN' will bring exploration on many of the facts and principles, inquiry and discovery, predictions and speculations. During long term voyages the life of international seafarers leave them isolated from friends, family and loved ones which develop mental stress. In ABHIJAN we like to have some articles from our alumni those are in professional career.

WE BELIEVE IN THE TERM 'VASUDHAIVA KUTUMBAKAM', THE WORLD IS ONE FAMILY AND TO ADHERE WITH THIS WE HAVE TO DEVELOP THE CONCEPTION OF HOME. WE HAVE TO DEVELOP OUR SEAFARERS WITH A FEELING FOR ONE WORLD, ONE FAMILY AND ONE HOME DURING VOYAGE TO OVERCOME THEIR MENTAL STRESS.

It is an honour and privilege to write a column as Director -SOMS in the first digital magazine published by this school since it had established way back in 2002. The institute has earned repute as a centre for quality education for its prime infrastructure tied up with modern equipment and green environment. An academically strong and committed team of faculties is the backbone of SOMS.



Director's Desk

"School of Maritime Studies- The Neotia University " is highly enlivened by the words of Alvin Toffler - "The illiterate of this century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn." In today's world where the potential of future marine officers needs to innovate and redesign themselves perpetually; SOMS nurtures them and provides them with a lavish platform to adapt the dynamic environment in ship operation and modern marine technology education. Since its inception , SOMS has established itself as an unsurpassed institute in the eastern India region. Institute's curriculum is an absolute blend of academic and applied knowledge which allows the students to develop quality skills and knowledge relevant to their respective Marine career paths, either in engineering or in nautical science discipline.

Like all above new initiatives , our e-magazine is also an initiative taken exclusively by the cadets to offer a platform for our students and faculties to showcase their knowledge , skills and creativity . This is going to be the first ever online magazine for SOMS and I wish a grand success for the Editorial Team alongwith all the cadets & faculties who worked tirelessly to give a final shape of the magazine . I strongly believe that this magazine will play an important role in transforming the potential of smart, eager students into innovative and interesting professionals who will be leaders to transform the world!



With my best wishes...

Partha Pratim Saha
Director of SOMS

EPISTLES FROM HOD



Mr. Somen Rai
HOD, MRE

I would like to express my pride to belong to the Marine Engineering Department, where we impart skill, knowledge and discipline to our students. Ours is a noble profession where we continue to serve the nation in any situation, either a normal or a pandemic situation. We prepare our students both academically and also impart hands-on training so that they can easily adapt themselves in the ship's environment.

Ours is an institute where we have one of the best infrastructures available and a very knowledgeable faculty bank with a long sailing experience and also faculties with industrial exposure. This is evident when we see some of our ex-students teaching in IIT, Delhi, Surveyors in IRS and even some of our ex-students are well placed and settled abroad.

We regularly conduct seminars, arrange workshops and bring experts from the marine field so that students' knowledge is enriched and also they can interact with the stalwarts of the industry.

Our main motto is to impart proper skill, knowledge and attitude. We encourage students for extra-curricular activities. I do strongly believe that like their seniors, present students also will set examples in different areas, be it as a Chief Engineer, Superintendent Engineer, Surveyor or in the field of research and innovations.

I take this opportunity to thank all our marine faculty and instructors for their continuous effort to improve the knowledge of the students and take the name of SOMS to a new height.

*Wish all my students a prosperous
and respectable life ahead*



Mr. Shekhar Chandra Saha
HOD, BNS

It gives me immense pleasure to see that the cadets of the School of Maritime Studies (SOMS) have successfully completed their objective to publish the first issue of the digital magazine, "ABHIJAN" with unflinching zeal and inspiration.

This is definitely the reflections of cadets' thoughts creativity and the fragrance of their beautiful minds. The cadets put forth their ideas, and thoughts which were lying dormant inside them. This magazine gives them a place to express their wonderful ideas and talents.

I wish them, especially the editorial board, participants, and organizer a grand success for the inaugural issue of this magazine. I also take the opportunity to thank all my colleagues, students, and contributors who have taken part to make this digital magazine a success. I hope the reader will find this magazine an enchanting challenge for young minds and encourage them for all-around development and for its long journey for the years to come.

The students showcased art, photography, poetry, short stories, comics, and some technical information on the subjects they are learning. I wish they will come up with more and more interesting innovative ideas in future issues of this magazine.

long live ABHIJAN !!!!

Last week of January, this year, our Director decided that we should be having an online magazine of our School of Maritime Studies of The Neotia University.

Putting a magazine together was no cake walk. All the editorial team members spent hours to make the magazine stand out and we are glad that "ABHIJAN", the first issue of this biannual magazine of the TNU School Of Maritime Studies(TNU SOMS) is here. The name of the magazine, "ABHIJAN" in Sanskrit means "to be born" it also means "to embark upon a voyage of adventure". The cadets in our school are all getting ready for their voyages on the high seas and this magazine belongs to them and shall exhibit their creativity, literary skills and innovative ideas.

"ABHIJAN" presents the hard work and dedication of the Cadets and also gives an insight into the TNU SOMS way of life and activities.

Creativity and hobbies for the seafarers are important for their psychological well being to overcome shipboard loneliness and stresses. In fact the 9th session of the IMO's Sub-Committee on Human Element, Training and Watchkeeping (HTW 9) was recently held from 6th to 10th February 2023 where an important topic discussed was psychological safety, where the aim is to create a safe working environment for all seafarers with sound mental health. The creative corner of "ABHIJAN" welcomes all cadets to contribute in their own way and give expression to their literary and artistic pursuits.

I would like to specially thank our Honorable Vice Chancellor for his constant encouragement and our Respected Director for his valuable guidance and help. Thanks to all members of our faculty for their co-operation and support. I have to specially thank our youngest and most energetic faculty member Shri Anirban Maity who has rendered a yeoman's service. I would also thank all the editorial team members amongst the cadets for their great effort in pulling this through in such a short time. I do express my considerable appreciation to all the authors, poets, artists and photographers for their creative pieces. These contributions have required a generous amount of time and effort. It is this willingness to share knowledge, concerns and special insights that has made this magazine possible and shall ensure a smooth sailing of "ABHIJAN" in the future.

BON VOYAGE!!

Editor's Note



In this issue

"Greener Shipping" is the theme of this first issue. The authors have discussed Shipping Industry's energy transition's current reality, and its potential, and practical solutions for rapidly closing the gap to net zero and sharing a perspective on how the shipping industry will rapidly reduce its carbon footprint, whilst exploring the different approaches taken to decarbonize.

A handwritten signature in purple ink, enclosed in a dashed yellow rectangular border. The signature appears to read "Tamal Mukherjee".

Tamal Mukherjee
Editor-in-Chief

EDITORIAL TEAM

ANIRBAN MAITY
CO-ORDINATER



FLYING IN THE SKY;
HOPE ,PROSPECTS AND DEDICATION OF
CADETS AND BEGINNING OF OUR "ABHIJAN"

RABI PAIK
4TH YR MRE



NILIMESH ROY
4TH YR MRE



GET YOUR DREAMS INKED
IN OUR "ABHIJAN"

I WISH "ABHIJAN" WILL
CONTINUE IT'S ABHIJAN

ANUPAM BAGE
3RD YR BNS



ANKUSH PAL
3RD YR MRE



WHAT YOU BELIEVE YOU CAN
ACHIEVE AS LIKE OUR "ABHIJAN"

BRINGING SEAFARERS TO
READ OUR "ABHIJAN"

NASIR HUSSAIN ANSARI
2ND YR BNS



MAHEK MALOO
2ND YR BNS



ONLY FROM OUR TRANQUILLITY
WE ACHIEVED THE "ABHIJAN"

I DIDN'T KNOW I'M THAT
CREATIVE UNTIL "ABHIJAN"

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GREENER SHIPPING



Is it a new era?

By:

— **Harsh Singh**

1st year BNS

& Mohd. Shaquib Khan

2nd year BNS

Environmental issues are one of the main problems that we face when we discuss the marine industry. The International Maritime Organisation (IMO) contributes to reducing the environmental impact of the maritime industry by regulating exhaust emissions, ballast water, etc.

The primary motive of the International Maritime Organization is to make this industry environmentally friendly through regulation. The International Maritime Organization has recently adopted an environmental certification program covering key environmental issues and has offered marine companies the opportunity to reduce their overall environmental footprint.

• *WHAT IS GREEN SHIPPING?*

Green shipping refers to the use of resources and energy to transport people and goods by ship and specifically concerns the reduction in such resources and energy in order to preserve the global environment from GHGs and environmental pollutants generated by ships. Today, companies are being asked to take measures to reduce emissions, consume less energy, and be more efficient.

• *WHY IS GREEN SHIPPING IMPORTANT?*

CO₂ emissions from international shipping began rebounding in 2021 from a dip in 2020

In 2021 international shipping accounted for ~2% of global energy-related CO₂ emissions. While measures approved by

the International Maritime Organization are likely to curb the rise of emissions over the 2020s, greater policy ambition is needed to steer the maritime shipping sector onto the pathway in the Net Zero Emissions by 2050 Scenario, which entails an almost 15% reduction in emissions from 2021 to 2030. Technological innovation, supportive policies and collaboration across the value chain are needed to drive the adoption of low- and zero-carbon fuels and technologies for oceangoing vessels.

• *HOW CAN WE MAKE THIS INDUSTRY GREENER?*

Measures to be taken in order to reduce the harmful effects on environment are as follows:-

- Cutting Sulfur Oxides emissions to improve air quality.
- Ballast water management needed to reduce hazards associated with it and Incorporate a ballast free system.
- Switching to low sulfur fuel.
- Use Methane\ LNG as Marine Fuel.
- Have a proper waste heat recovery system.

METHANE AS FUEL IN MARITIME INDUSTRY:

Liquefied Natural Gas (LNG) (over 95% methane) is one of the most frequently used marine alternative fuels for compliance with current SOx and NOx limits and to reduce CO2 emissions from ship operation. The LNG carrier industry has been utilizing gas boil-off from LNG cargo for more than 40 years to reduce fuel and voyage costs. The use of LNG was limited to these niche capacities until the recent adoption of stricter emissions limits over the past decade. LNG is a colorless and non-toxic liquid, created from natural gas cooled to -162 degree Celsius. It typically comprises more than 95% methane (CH4), and less than 5% mix of other hydrocarbons (typically ethane, propane, and butanes) and nitrogen.

Methane can be obtained from both fossil-based sources and biomass. Fossil-based LNG is obtained from the extraction of natural gas from the reservoirs. The gas is processed to remove heavier hydrocarbon gases and other impurities and then cooled to cryogenic temperatures in an LNG train to convert its state from gas to liquid. Biomethane is mainly produced through anaerobic digestion (AE) or biomass gasification, although there is a trend to recover energy from waste via gasification, for example, from agricultural wastes, organic wastes, manure, and sewage sludge. Biomethane has similar properties to fossil-based natural gas, therefore it can be liquefied and distributed by leveraging natural gas infrastructures. However, biogas produced from anaerobic digestion contains a large fraction of CO2, which must be purified to achieve a purity of biomethane over 95% before use as a marine fuel. The costs of purification are relatively high due to the use of energy and chemicals in the process, and this is one of the main barriers for the wide adoption of biomethane as fuel.

WHY SHOULD WE USE METHANE OVER DIESEL AS A FUEL?

Diesel is a mixture of 25% of aromatic hydrocarbons such as alkyl benzenes and naphthalene and 75% of saturated hydrocarbons such as paraffin. Its chemical formula is ranging from C10H20 - C15H28. Hence, a single molecule of diesel emits around 20-28 molecules of carbons whereas Methane (CH4) emits only one molecule of carbon. This huge difference in the number of carbon molecules emitted makes the change. Since, the number of carbon molecules emitted by methane is much lesser than that of carbon molecules emitted by diesel, diesel leaves a huge impact on the environment in a negative way as carbon is one of the major threat to the environment as it is an agent of global warming and climate change. And if we use methane as a fuel in this shipping industry, the amount of carbons emitted by the vessels will be much lower than that of now. Hence, we will be able to maintain the balance in the environment by controlling the overall production of the main cause of this global warming (i.e. Carbon). This step will help us in going green and eco-friendly.

ADVANTAGES OF USING METHANE AS FUEL:

- Methane is a natural gas. So, it is a major fuel.
- Methane is also the building foundation for hundreds of compounds which we use to make thousands of our products today.
- Methane produces more heat and light energy by mass than other hydrocarbon or fossil fuel while producing significantly less carbon dioxide and other pollutants that contribute to smog and unhealthy air.



DISADVANTAGES OF USING METHANE AS A FUEL:

- Storing and utilizing methane will be difficult.
- Methane is highly inflammable, which increases the risk of fire accidents.
- Methane has a GWP of 34. This means 1 ton of methane is equal to 34 tons of CO₂ and therefore captures more heat per molecule compared to CO₂ thus methane is a more powerful greenhouse gas than carbon dioxide, but there is far less of it in the atmosphere and it does not stay there as long.

FUTURE DIRECTIONS:

Despite all the cons, methane is still considered to be a better alternative to other fossil fuel sources and efforts are certainly underway to make it a leading source in the future. The maritime industry alone is contributing around 90% in the world trade, and if this industry goes greener then it will be the icing on the cake. But, experts believe that the release of methane from clathrates are believed to be slow and chronic rather than catastrophic, and much of it never reach the atmosphere.

However, it is probably for the best if we could minimize the amount of energy we all use over time, which could then alleviate demand and furthermore preserve whatever fuel sources we still have on Earth.

Using Renewable Energy Sources

In addition to improving fuel efficiency, many companies are investigating ways to power ships with renewable energy sources. This includes the use of wind power, solar power, and wave power. For example, some ships are outfitted with sails to harness wind power, while others are outfitted with solar panels to generate electricity. These technologies are still in the early stages of development, but they have the potential to significantly reduce emissions from ships in the future.

LET'S GO GREEN!!

THERMOELECTRIC GENERATOR



By:

— Rabi Paik

4th year MRE

ThermoElectric Generators (TEGs), are well renowned through various terms like Seebeck devices, Peltier generators, and further more . With heat source and cold sink being the main edge , waste heat is evolved into green power.

For remote locations that are off grid still having a heat source ,thermoelectric generators are most suitable for them.A noteworthy amount of thermal energy is generated inside a ship. A decent amount of reusable power can be triggered if the energy is saved and utilised efficiently.

Additional pressure drop is caused as a result of heat recovery from a heat exchanger which is not intended usually .

Analyzing a vertically fitted Thermoelectric generator (TEG) in the exhaust pathway of a vessel for power generation is an auxiliary option.

Principle of TEG is based on Seebeck effect in which electricity is generated due to flow of electrons in electrically conductive metals /alloys /semiconductors due to temperature differences . The TEGs in conjunction with the engine can be used at adjacent exhaust (Incinerators,boilers etc.) which will act as if two generators are acting in series (Thury system of connection) and supplementary output can be expected.

The output power can be used to power, low energy requirement applications like electric control panels of a machinery, panels in engine control room (ECR) which will make it long lasting at

running hours, various sensors which need micro/milli amperes of current and various other devices. The energy can also be preserved in batteries for battery powered operations. This in turn will reduce the o/p demand of the generator by great extent ,saving fuel for running the generator. Minimal maintenance, zero emissions, results in an environment friendly situation with this one-time investment in the installation of this system of electricity generation .

INTRODUCTION

Surging need for economical use of resources have led the associations to uptake various renewable, non-polluting and efficient sources of energy. Securing the waste energy from the effluents emitted by the machinery and utilising it for running system accessories, auxiliaries which would reduce the pressure on the power generating bodies, leading to economizing fuel and capital.

With this policy, TEGs (Thermoelectric generator) were incorporated in various industrial sectors such as power plants, automobiles etc. These are one of the few methods to store waste energy into quality ones. On-board ship, energy is cut in the form of exhaust heat. Recent research shows that the ship's exhaust has a potential of generating 6.2 MW of energy which is quite large. Thus, the use of TEG's can help in resuscitate some part of this waste energy and can be utilised for bringing down consumption of fuels and successive emissions.

METHODOLOGY

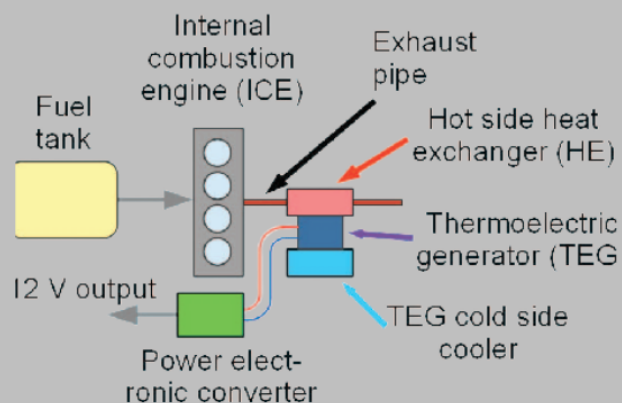
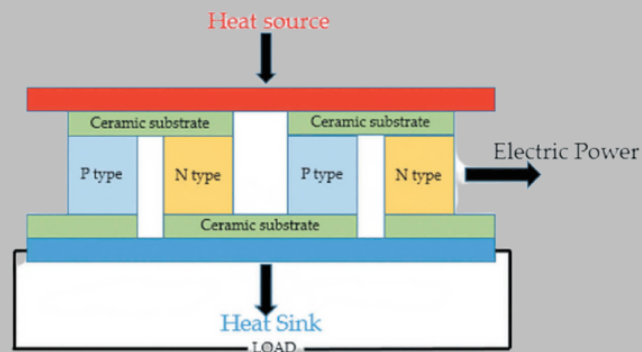
Thermoelectric Generator (TEG), a immobile device with no moving parts generates electricity on the principle of Seebeck effect . The postulate on which TEG's work was discovered by Thomas Johann Seebeck, a German physicist which states that an emf is generated between two electrically conducting metals/alloys when there is temperature difference/gradient between the two. When there is a temperature difference, the charge transfer (electrons/holes/ positive particles) in the metal at the hot side flow towards the cold side metal which generates a potential drop and hence the current. TEG leads to DC electricity and a single TEG has a capacity of about 1W to 125W.

TEG is constructed of semi-conductors like Bismuth telluride (Bi_2Te_3), lead telluride (PbTe), and silicon germanium (SiGe). Metals like stainless steel, copper compounded with semiconductor for high temperature usage. The competency the TEG is about 10%-20% and is directly proportional to the Temperature Gradient . The electrical and thermal conductivities are generally high or low in a material as the energy is convey through electrons. Recent developments in the field of ceramics have seen materials that can possess high electrical conductivity and low thermal conductivity which would keep the temperature gradient as high as possible and favour an increase in performance.

In the exhaust funnel of the ships, TEG part can be positioned vertically which would allow the exhaust to flow without any interference (horizontal arrangement cause back pressure formation in the funnel). There are no fins in the hollow vertical chamber. The temperature of flue gases in combined exhaust funnel is about 200°C - 250°C after passing through turbochargers and exhaust gas economisers. The individual exhaust of auxiliary machinery such as incinerator is about 800°C - 900°C which is again an perfect location for TEG installation.

This system is put through to high temperatures and hence the semiconductors cannot be directly exposed to the flue gases as they might be destroy. Thus, the TEG unit is made up of Stainless steel and copper compounded together with the internal unit. Stainless steel and copper are used as steel has very good thermal conductivity and copper has very good electrical conductivity. Semiconductor unit is forced between these two plates with a ceramic liner on both sides of semiconductor which acts as thermal refractor and promotes working temperature range of the semiconductors.

Such two major system(Main and Auxiliary (Incinerator) can be arranged together for more power output using "THURY SYSTEM OF CONNECTION OF SERIES GENERATOR". This complete system acts as if generators are connected in series. In this case the opposite semiconductor plates of a module with respect to the module to be connected are coupled. This leads to generation of more current with constant voltage. This will be very effective for power generation. Also, the generated DC current by the unit after converting into AC can be used to run AC devices and panels. The conversion system consists of an inverter made up of IGBT / SCR which converts DC to AC.



Source: Internet

CONCLUSION

Use of EGTEG can be one of the major boons in today's shipping world as it caters the purpose of GREEN ENVIRONMENT and overcomes the demerits of the traditional systems present in past.



AIR LUBRICATION

Source pic: Internet

The shipping industry transports over 80 percent of global trade through seaports worldwide by volume, which is more than 70 percent of global trade value and is recognized as the backbone of world's economy and global trade.

Though the shipping industry has a positive influence on global economic development, in terms of pollution, it has some adverse effects which harms the environment and is considered as a significant source of air and water pollution. 300 million tons of fuel is consumed by the shipping industry every year, releasing around 3 percent of the world's CO₂ emissions into the atmosphere. Shipping accounts for annual NO_x, SO_x and CO₂ emission from anthropogenic sources at 15%, 13%, and 3%, respectively, recorded data as per ship's emitting air pollutants from 2007 to 2012 globally.

**By- Vicky Kumar Saw, 2nd year BNS
& Binet Kumar Mishra, 3rd year MRE**

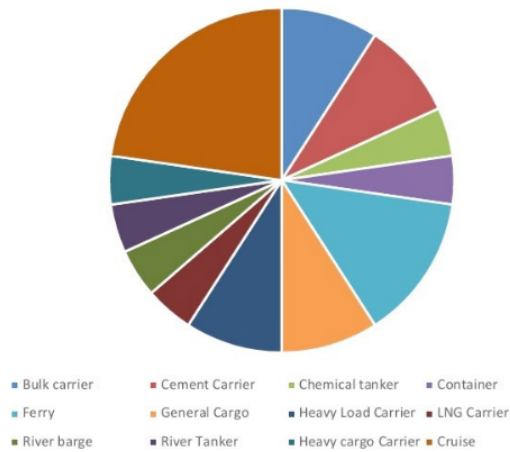
In 2018, the IMO published a preliminary plan to cut ship emissions of GHG. Numerous energy-saving solutions, like air lubrication, have been developed to fulfil the needs of the industry in order to reduce carbon emissions and to comply with rising Energy Efficiency Design Index (EEDI) Phase III levels. According to MEPC.1/Circ.815, air lubrication systems are acknowledged by IMO as a Category B-1 "Innovative Energy Efficiency Technology."

Greener shipping is all about reducing the fuel consumption to reduce the carbon emissions. The total carbon emissions cannot be eliminated but it can be controlled to some extent at the starting stages and then we can think of any further modifications to reduce the emissions to some more extent.

Air lubrication system is one of the ways by which we can reduce the Co2 emissions from ship. Mitsubishi was first to implement the idea of Air lubrication system. When Mitsubishi came out with their Air Lubrication System, it was just one of the several energy-saving techniques for ships. MALS was developed in the marine industry by Japanese Shipbuilder Mitsubishi Heavy Industries (MHI). According to DNV MALS is one of the promising technologies which can help ships to increase their efficiency and reduce energy losses

Air Lubrication System is a method to which reduces the resistance between the ship's hull and seawater by the help of air bubbles. The layer of air bubble across the hull surface reduces the resistance working on the ship's hull, creating energy- saving effects. With the right ship hull design, the air lubrication system is expected to achieve up to 10-15% reduction of CO2 emissions, along with significant savings of fuel.

The Air Lubrication System works on the simple principle of trapping a layer of air bubbles beneath the ship's hull. Air bubbles covers the vessels hull like a carpet of air. air bubbles are generated by using a dedicated system of blowers to pass them continuously beneath the ship's surface. Air bubble outlets are created at different locations along the bottom of the hull, symmetrically on both sides of the ship's centre line. A layer of bubbles is formed by blowing air at a constant rate, which reduces the drag and resistance between the ship and the seawater. The system should continuously replenish the lost air bubbles to ensure that a uniform layer of air bubbles is maintained beneath the ship's hull and the desired effect is produced.



Components of Air Lubrication system

- ARUs: (Air Release Unit) are installed at the leading edges on the bottom of the hull, the number of ARUs depends on the size of the vessel.
- Compressors: low-pressure oil free compressors connected to the ARUs
- Piping and valves: Piping are used which connects the compressors with the ARUs, and non-return valves are used to regulate pressure.
- Control and automation: Data collected (speed and air flow) from the vessel are used to regulate the compressors; and a basic vessel automation system for alarms and monitoring.

Different Method of air lubrication:

- Bubble Drag Reduction (BDR)
- Air Layer Drag Reduction (ALDR)
- Partial Cavity Drag Reduction (PCDR)

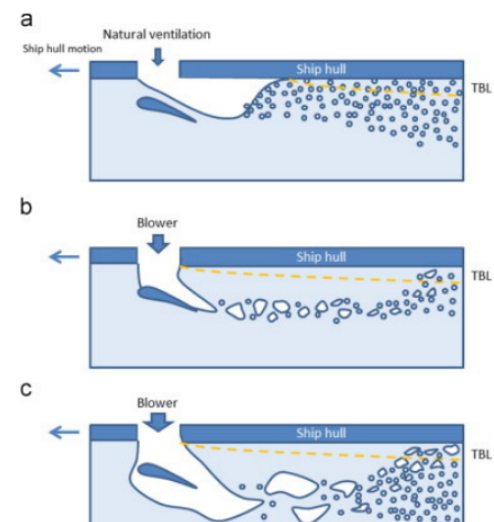
Air lubrication's current applications:

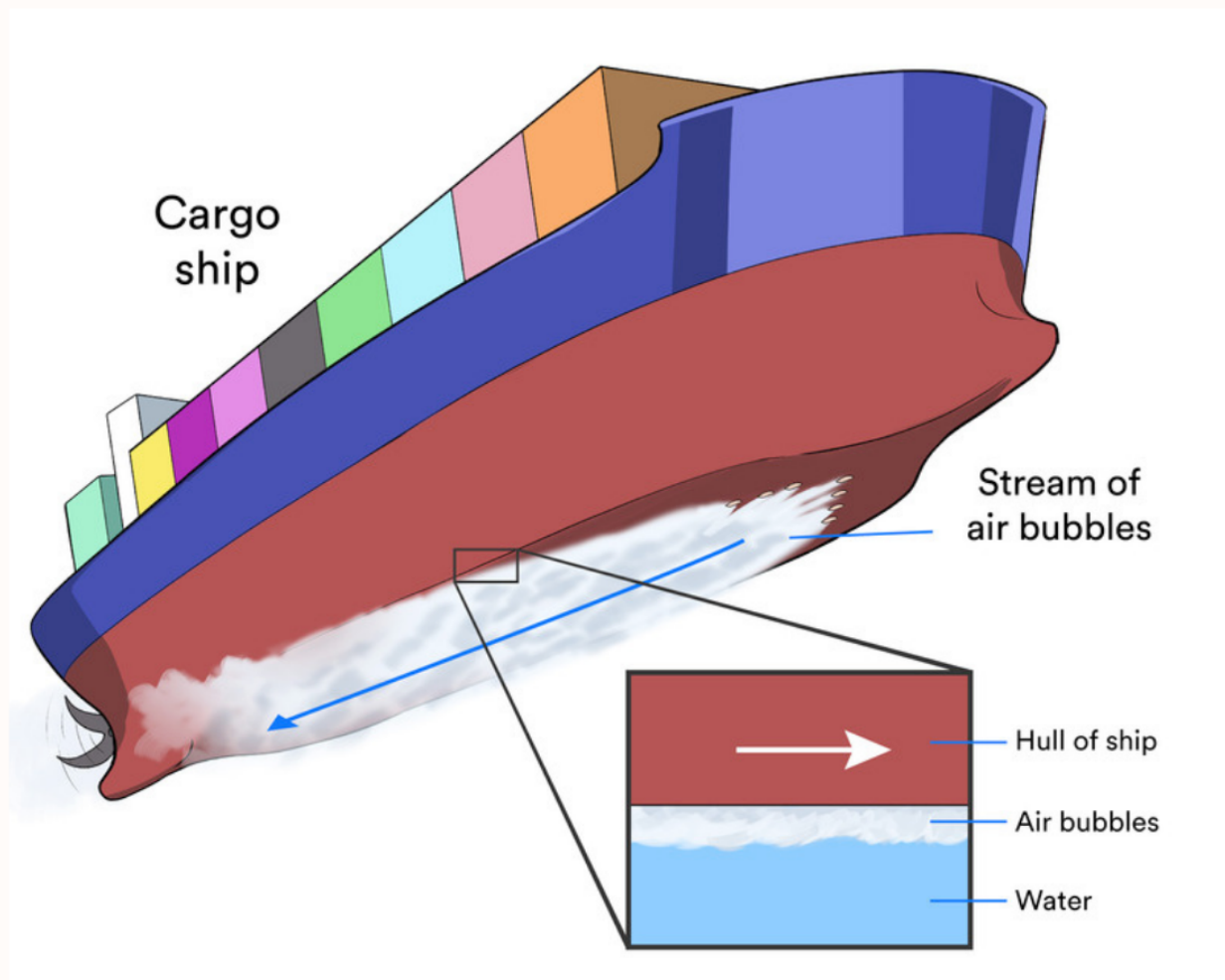
Advantages:

- Reduces fuel consumption and associated emissions by up to 10%
- Gain operational flexibility by trading fuel savings for increased vessel speed as needed
- Improve the Energy Efficiency Design Index (EEDI) for ships to be build and the future Energy Efficiency Existing Ship Index (EEXI) of existing vessels
- Benefit from lifecycle service and support for the vessel's entire lifespan

The Air Lubrication System being regarded as a promising technology has some concerns regarding its implementation and performance on ships.

Some of them are mentioned below,

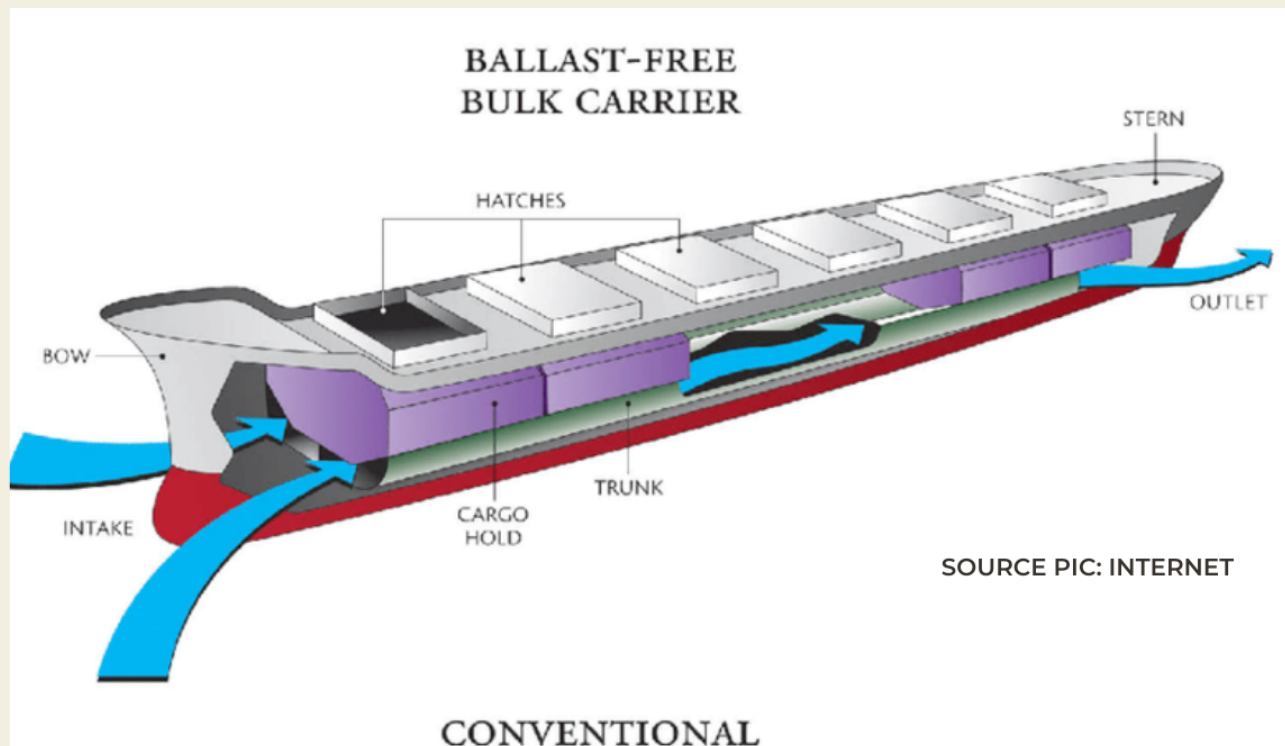




Some of them are mentioned below,

- The Air Lubrication System (ALS) has a limitation of being used only for certain types of ships having flat bottoms. Ships with V-shaped hulls, such as certain warships are exempted from the benefits of the air lubrication system.
- Trapping the layer of bubbles beneath the ship's hull had been a challenging task for the ship builders. They came up with a solution of protruding ridges at the edges of the hull which can help in trapping the layer of bubbles. Designing the ship's stern or hull in such a way that it traps the air bubbles beneath the hull. However, this would increase the building cost of the ship.
- Stability of ship: The air cavities designed for trapping the air bubbles may affect the stability of the ship at the sea. This can cause difficulty to the ship and the crew especially in rough seas.
- The air bubbles leaving the hull and flowing into the ship's propeller influence the efficiency and lead to noise, and vibration of the propeller. But few experiments shows that there were negligible effects of air bubbles on the propeller. Though rough seas and changes in fluid density can produce unfavourable results.
- An arrangement is necessary to ensure that the air bubbles formed are of uniform diameter and equally distributed under the ship's hull to get the desired effect. Change in diameter of the bubbles will affect the distribution of bubbles.

This is just the beginning stage we need more research and experiment to achieve 100 % greener shipping with no concerns about implementations and performance of ships.



BALLAST FREE SHIPS



BY- ADITYA KENNEDY
3RD YEAR BNS

- ***What exactly is Ballast water and why do we need it in ships?***

When no cargo is transported by ships, the vessel becomes light, which may have an impact on its stability. For this reason, ballast water is taken in dedicated ballast tanks to stabilize the ships. Ballast water is pumped to maintain safe operating conditions while travelling. This practice reduces stress on the hull and provides transverse stability, which improves propulsion and manoeuvrability, and it compensates for weight changes in various cargo load levels due to fuel and water consumption. However When we take ballast water from the sea or inland water, sediments and microorganisms, including bacteria, are transferred into the ballast tanks, and many of these organisms can survive when stored for an extended period of time, so when we discharge that ballast water at another location, we are transferring those organisms with us.

- ***What is ballast water Management?***

In the concept of a ship without ballast tanks, traditional ballast tanks are replaced with longitudinal structural ballast trunks that extend below the ship's cargo area under the ballast draught. These trunks are flooded with seawater to reduce the vessel's buoyancy when ballast is present, leading the vessel to its ballast air currents. Due to the natural hydrodynamic pressure differential between the bow region and the stern region of a ship while it moves through the water, a slow flow is introduced in these open ballast trunks. As a result, ballast trunks are always full of local seawater moving slowly, limiting the transport of non-native aquatic species around the world.

Nevertheless, ballast-free vessels face many obstacles, as these designs can reduce the cost of ballast water treatment, but increase the cost of building the hull and operational costs. Moreover, many vessels also have specific dimensional restrictions which is a major setback.

- ***The Features of ballast free ships***

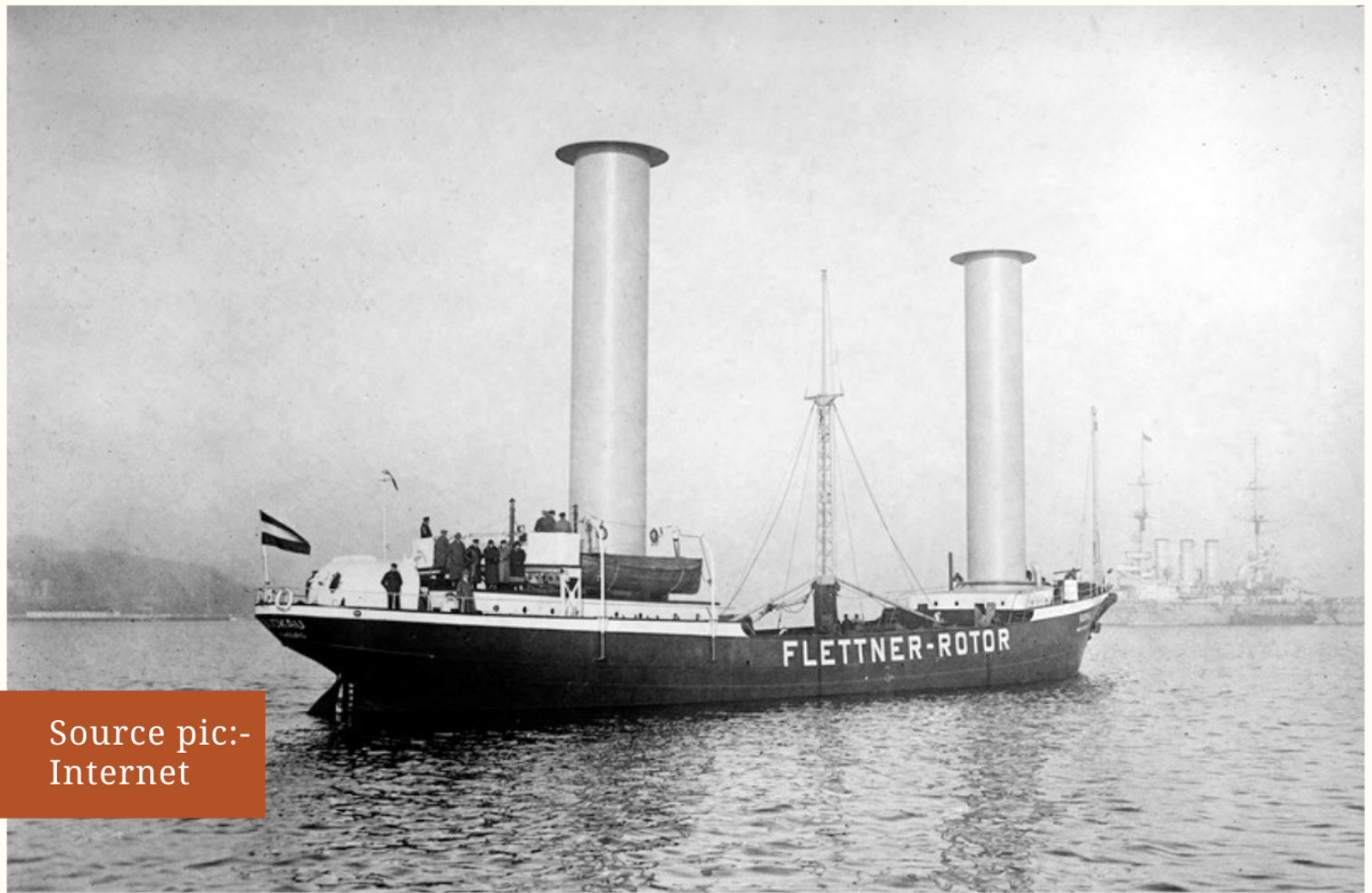
- Ballast trunks: Vessel ballasts are replaced by longitudinal structural ballasts under the cargo area, under the ballast line. These submerged ballast trunks in ballast conditions reduces buoyancy.
- Hull Shape: V-shaped hull to minimise resistance and optimize propeller conditions under fully charged and unloaded conditions, as it reduces the weight of the wet surface.
- CFD tools: Computational Fluid Dynamics (CFD) compares the strength of the new design with the conventional design and helps maximize pressure fields in the bow and stern area.
- Propulsion: The twin screws and propellers of optimal diameter allow a small draught towards the aft in the discharged state and ensure a high propellant efficiency by superimposing the arrangement of the propeller. Propulsion power is estimated from stress and propeller analyses.
- Trim and heel: Longitudinal bulkheads provide moment equilibrium around the longitudinal axis for all segregation solutions and prevent large edges from occurring during cargo operations.
- Cargo Segregations: Triality to be loaded in regard to this following segregation share:
 Segregation 1: 55%
 Segregation 2: 25%
 Segregation 3: 20%

- ***Advantages of Ballast free ships –***

1. Getting rid of pumps, pipes, and valves associated with ballast water tanks could reduce the cost of maintenance, free up electrical power required for de-ballasting and would require no ballast water treatment systems making it economical to comply with IMO rules.
2. In addition, it also increases the service life of vessels without the threat of corrosion, caused by sedimentation build on ballast tanks. This reduces inspection and management costs and makes the job of crew members easier.
3. Maintaining capabilities will also improve capabilities and allow for movement without heavy ballast tanks, which would reduce the impacts of slamming in heavy weather.

Source: Ship Technology





ROTOR SAIL SHIPS

BY NASIR HUSSAIN ANSARI
2ND YEAR BNS

The shipping industry is an essential component of the global economy, connecting countries and continents through the transportation of goods and materials. However, shipping has a significant environmental impact, and as the world continues to address the issue of climate change, there has been a growing focus on finding ways to make shipping more sustainable and reduce its carbon footprint.

"The question does it really helps?"

One promising solution to this challenge is rotor sailing, also known as Flettner sailing. Rotor sailing is a technology that harnesses the power of wind to reduce the fuel consumption of ships and reduce emissions. The concept is based on the use of large cylindrical rotors, mounted vertically on the ship's deck, that spin in the wind and generate lift. This lift helps to reduce the power required from the main engine, which in turn reduces the amount of fuel consumed by the ship and the emissions it produces.



Sorce pic:- Internet

Rotor sailing is expected to have a significant impact on the shipping industry, as it has the potential to reduce fuel consumption by up to 20%. This reduction in fuel consumption not only reduces emissions, but it also results in cost savings for ship operators. Rotor sailing also helps to reduce dependence on fossil fuels, which are a finite resource and the primary source of greenhouse gas emissions.

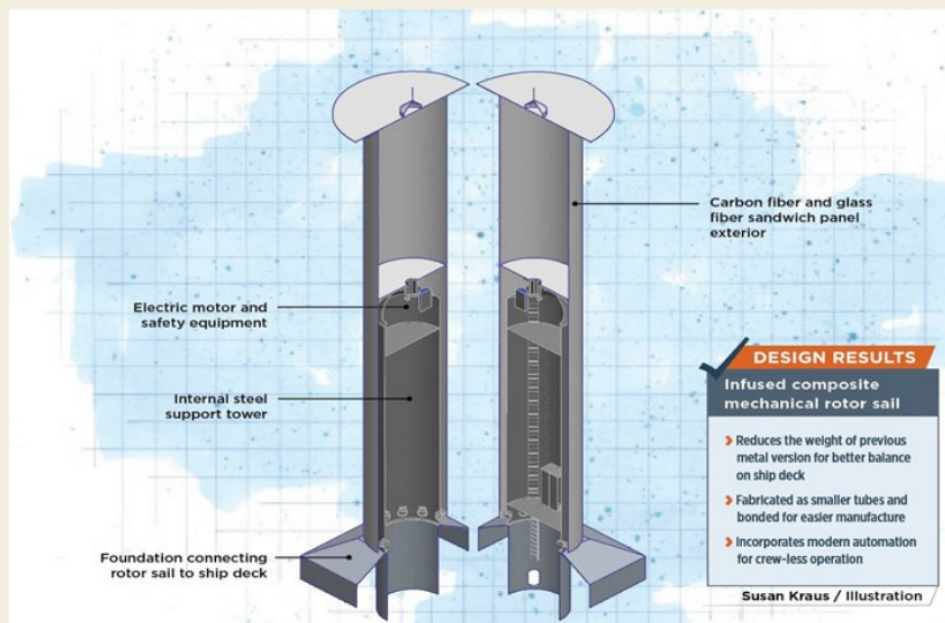
In addition to rotor sailing, the shipping industry is exploring a range of other innovative technologies and approaches to make shipping more sustainable. One of these approaches is the use of electric propulsion, which replaces traditional diesel engines with electric motors powered by batteries or fuel cells. Electric propulsion reduces emissions, as well as noise and vibration, making it an attractive solution for both the environment and ship operators.

Another approach to greener shipping is the use of alternative fuels, such as liquefied natural gas (LNG) or biofuels. LNG is a cleaner-burning fuel that produces fewer emissions than traditional diesel, and it is becoming increasingly popular as a shipping fuel. Biofuels are also being developed, with some companies exploring the use of waste-based biofuels made from products such as cooking oil or sewage sludge.

There is also a growing focus on energy efficiency and the use of digital technologies to improve shipping operations. Technologies such as big data analytics and predictive maintenance can help shipping companies optimize their operations and reduce emissions by

PREDICTING AND PREVENTING PROBLEMS BEFORE THEY OCCUR. IN ADDITION, DIGITAL SOLUTIONS SUCH AS ONLINE SHIPPING PLATFORMS AND BLOCKCHAIN CAN HELP REDUCE WASTE BY STREAMLINING PROCESSES AND IMPROVING TRANSPARENCY.

THE DESIGN OF NEW SHIPS IS ALSO A CRITICAL FACTOR IN MAKING SHIPPING MORE SUSTAINABLE. THE SHIPPING INDUSTRY IS INVESTING IN THE DEVELOPMENT OF MORE AERODYNAMIC DESIGNS AND THE USE OF ADVANCED MATERIALS TO REDUCE EMISSIONS AND IMPROVE ENERGY EFFICIENCY. THERE IS A GROWING FOCUS ON REDUCING THE WEIGHT OF SHIPS, WHICH CAN REDUCE FUEL CONSUMPTION AND EMISSIONS, AND ON IMPROVING THE ENERGY EFFICIENCY OF THE SHIP'S PROPULSION SYSTEM.

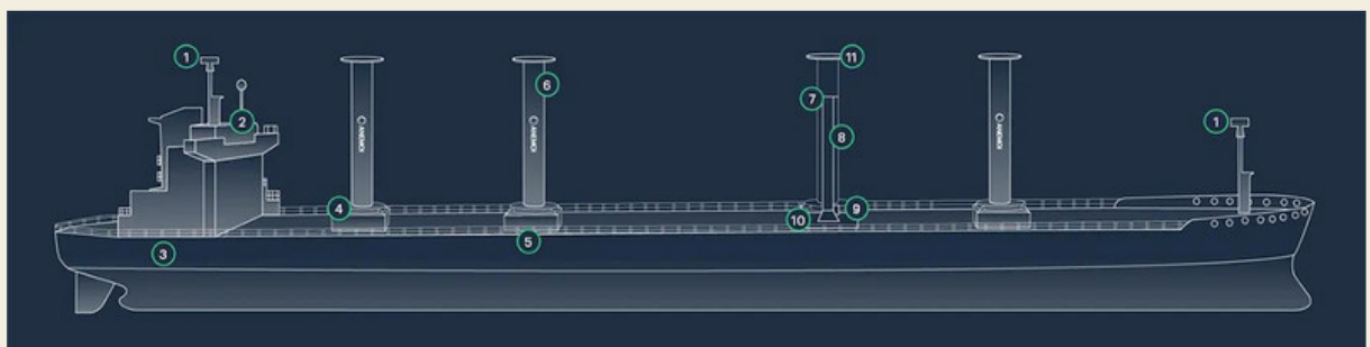


SOURCE:
COMPOSITESWORLD

However, it is not just the shipping industry that needs to play a role in making shipping more sustainable. Governments and international organizations also have a critical role to play in this effort. This can be achieved through the implementation of policies and regulations that encourage the use of greener technologies and fuels, and through the development of international standards for shipping.

The global community must also work together to address the challenge of climate change, and the shipping industry has a unique opportunity to play a critical role in this effort. By investing in innovative technologies such as rotor sailing and working together to reduce emissions, the shipping industry can help create a greener, more sustainable future for all.

In conclusion, the shipping industry is facing significant challenges in its quest to reduce its carbon footprint and become more sustainable. However, with the development of innovative technologies such as rotor sailing and the growing focus on energy efficiency and digital technologies, the shipping industry has the potential to play a critical role



1. Wind sensor
2. Electrical & control system
3. Electrical hardware
4. Deployment system
5. Foundations
6. Rotor sails

7. Upper bearing
8. Steel tower
9. Electric drive
10. Lower bearing
11. Composite rotor

CAMPUS REPORT

JULY-DECEMBER 2022

JULY 2022



UGC inspection was conducted on the day of 7-8 July 2022 and they declared that SOMS has one of the best facilities and infrastructure for the field of Maritime Studies. They also mentioned SOMS as one of the vertical pillars in TNU

AUGUST 2022

OUR UNIVERSITY INDIA'S 76TH INDEPENDENCE DAY ON 15TH AUG 2022



ISO 9001:2015 CERTIFICATE WAS AWARDED BY TH DNV-GL ON 17TH AUG 2022

SEPTEMBER 2022



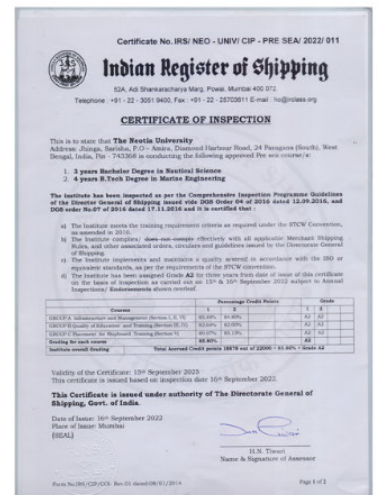
TO MARK THE BIRTH ANNIVERSARY OF
THE COUNTRY'S 2ND PRESIDENT DR.
SARVEPALLI RADHAKRISHNAN WE
CELEBRATE TEACHER'S DAY ON 5TH
SEPTEMBER

10 SEPTEMBER 2022



SEMINAR ON "NEW TECHNOLOGIES FOR
GREENER SHIPPING" ON THE OCCASION TO
CELEBRATE WORLD MARITIME DAY

INDIAN REGISTER OF SHIPPING INSPECTED OUR UNIVERSITY FOR CIP INSPECTION AND GAVE SATISFACTORY REMARKS AND CERTIFICATE ON 16TH SEPTEMBER



TREE PLANTATION INSIDE OUR CAMPUS ON THE EVE OF PM'S BIRTHDAY



NORTH-EAST SCHOOL STUDENTS VISITED OUR SHIP-IN-CAMPUS ON 22 SEPTEMBER 2022



OCTOBER 2022

RASHTRIYA EKTA DIWAS ON 31ST OCTOBER



SOMS ORGANIZED ONE DAY NATIONAL WORKSHOP ON THE TOPIC OF "INTERNET OF THINGS(IOT) ON GLOBAL MARITIME NETWORK" ON 25TH NOVEMBER



DECEMBER 2022

CONVOCATION DAY ON 6TH DECEMBER 2022





MENTAL HEALTH WORKSHOP FOR CADETS OF SOMS ON 5TH DECEMBER



ASMI SHIPS PVT.LTD. VISITED OUR UNIVERSITY FOR THE INTERVIEW OF SOMS CADETS ON 27TH DECEMBER



FLEET MANAGEMENT VISITED SOMS CAMPUS FOR INTERACTION WITH CADETS ON 16TH DECEMBER





AWARDS AND RECOGNITION

ADITYA KENNEDY



TABLE TENNIS

DOUBLE'S WINNER
SINGLE'S RUNNERUP



BEST BNS CADET



ANUPAM BAGE

3RD YR BNS



BASKETBALL

WINNER

BEST OVERALL CADET



SANMOY KARMAKAR

4TH YR MRE

ESSAY WRITING WINNER



ANKUSH PAL

3RD YR MRE

MEHAK MALO



BADMINTON

DOUBLE'S WINNER
SINGLE'S WINNER



BEST MRE CADET



SK ALAMGIR

4TH YR MRE



POSTER PRESENTATION

3RD YR MRE



WINNER

BINET KR MISHRA
ANKUSH PAL
DEBAJYOTI DUTTA

3RD YR BNS



1ST RUNNER UP

ADITYA KENNEDY
AVINASH SINGH

2ND YR BNS



2ND RUNNER UP

NASIR HSSAIN ANSARI

Sportsilla



LITERARY CORNER

WE, ARE MARINERS



Nilimesh Roy
4th year MRE

When clouds make their home in the sky
When the dancing water is passing by...
We, Mariners, stand to do fly
The ship, when the water gets high.

When the storm are getting near
When the ocean gives them a pair
We, Mariners, stand with a hand upon gear
To move forward without any fear.

Yes, we stand and fight saying family bye
To bring a smile on their face and eye.
Everybody will remember the name
I bet, nobody will recall the pain.

We are the Mariners, we know how much
sacrifice
It takes; but we keep our mind as cool as ice.

সেই নাবিক



Suvadeep Das
2nd year MRE

স্রোতের টানে বদলাবে স্থান ধ্রুবক হবে না থেমে
থাকা,
মৃত্তিকা হীন আবাসে নেই কো কোনো
পরিচিতের দেখা।
মানসিকতা বদলে যাবে ধৈর্যের বাঁধ হবে শক্ত,
সমুদ্র শহরে ভেসে যাবে শুধু দূর সম্পর্ক হবে
বিভক্ত।
ভিটে মাটি ছেড়ে ভবঘুরে সে, কোনো স্থলে
নয়কো স্থায়ী,
পরিবার স্বজন অপেক্ষারত কবে ফিরবে ঘরে ?
দ্বার পানে রয়ে চাহি।
সম্মুখে যেনো দু নীলের মিলন কানে ভেসে শুধু
স্রোতের কল্লোল,
পরিশ্রম ঠিকই বুঝিয়ে দেবে পেশা কভু হবেনা
বিফল।
জীবন মইয়ে পৌঁছবে উচ্চ শিখরে ভুলবে
অতীতের লড়াই,

The Paradigm of Mariner's Life



Pratyay Sarkar
1st year MRE

The morning starts with PT- our morning hustle,
With our warden's whistle.
Then comes the breakfast,
And really it gotta be damn fast.
Our dress fall-in, pride and parade to sum up. All smart and
respectful in a good dress up.
Then comes the classes, Few boring, few interesting, But loved
by the masses.
Evening starts with our games fall-in, Where it's all about
parade and little bit of chillin.
The favourite one, leisure time, Out there with different games
and studies, making it a perfect rhyme.
At last the night fall-in is there, And that marks the end of the
day which is nothing sort of a fair.
Well yeah it's a course, Which is hard. But that's what makes us
the mariners, A class apart....

I AM A VESSEL

The blades of the propeller moves me forward, but the anchor always pulls me back.

When a sea storm hits hard to bear the fear, my life gets rolled and pitched, then- the anchor realise that there is nothing greater than the truth.

An anchor is a bond that may be of love, work or different stages of life.

I am moving forward in the great unknown sea withdrawing my family, but the rusted anchor pulls me back again and again to my family.

Mita Patra
2ND year - BNS Cadet

SUCCESS

কেউ বলে তুমি নাকি অদৃশ্য

কেউ বা বলে তুমি নাকি ভগবানের শিষ্য

কেউ খুশি হয় তোমাকে দেখে

কেউ বা খুশি হয় তোমার স্বপ্ন দেখে

কেউ বলে তোমাকে পেলে স্বপ্ন পূরণ করবে

কেউ বা বলে তোমাকে পেলে স্বপ্ন পূরণ হবে

কেউ বলে মানুষ Famous হয় তোমার জন্য

কেউ বা বলে মানুষ জীবন দান দেয় তোমাকে পাওয়ার জন্য

কেউ বলে Success দেখায় আগের রাস্তা

কেউ বা বলে Success কে পাওয়ার জন্য খুঁজতে হয় রাস্তা

কেউ বলে তোমার দ্বারাই দূর হয় Anxiety

কেউ বা বলে তোমাকে না পেলেই হয় Anxiety

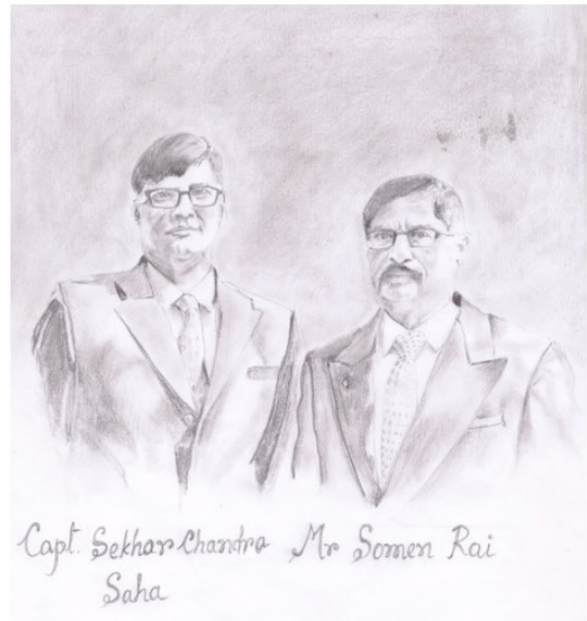
Written by Sani Paria
3rd Year -BNS cadet



FROM THE BRUSHES OF SOMS



Cdt Snehasish Roy
1st year BNS

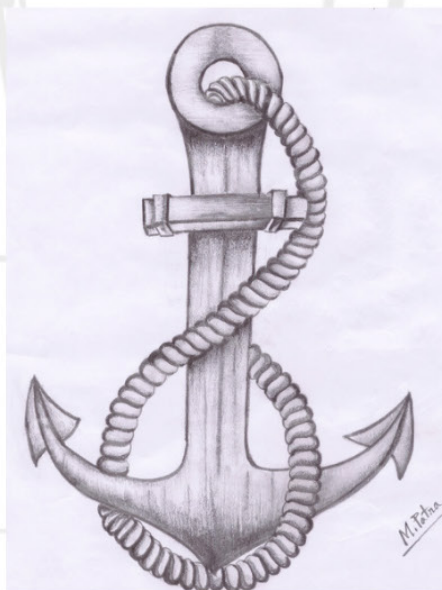


Capt. Sekhar Chandra Saha
Mr Somen Rai

Cdt Snehasish Roy
1st year BNS



Cdt Debadrita Sarkar
1st year BNS



Cdt Mita Patra
2nd year BNS



Cdt Debadrita Sarkar
1st year BNS





**1ST YR BNS
SNEHASISH ROY
1ST YR MRE
PRITAM RANA**

THE LION AND THE MOUSE

This famous Aesop fable tells of the importance of kindness.

One night in the jungle....



Gotcha!



Please don't eat me, sir!



And why not?



If you'll be so kind as to set me free, I'll pay you back my helping you some day!



YOU? Help ME?
HA! HA! HA!
Haaaaa--
haHAA ha!



LATER

HELP! HELP! Someone
PLEASE help me!



It's you! Oh my
gosh! Hunters
tied me up!
They'll be back
any minute!



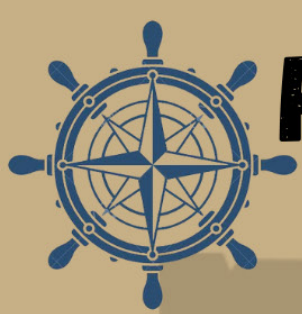
Don't you worry
I will chew through
these ropes
in no time!



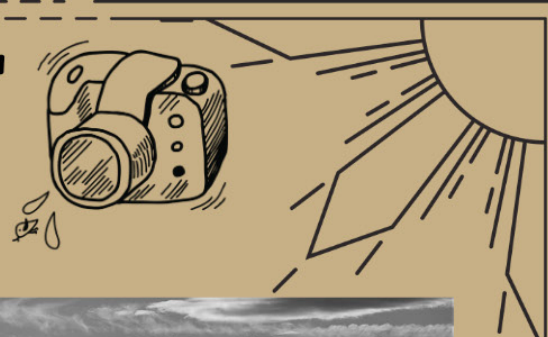
Thanks
Little buddy!

Moral:- The Love and kindness are never wasted.





FROM LENS OF SOMS



MR SUBIR BASU

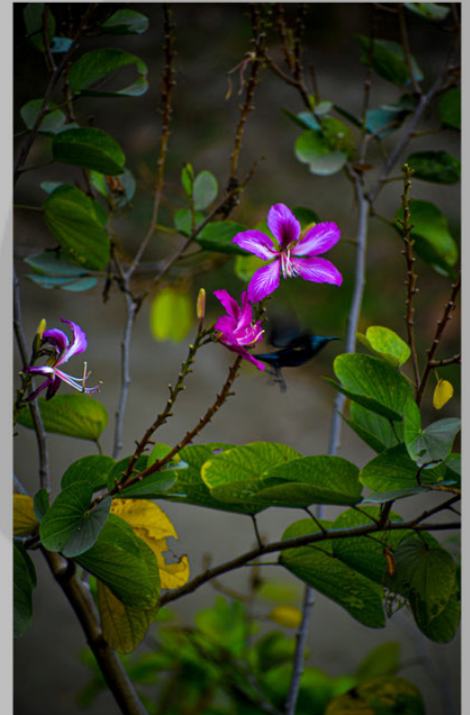
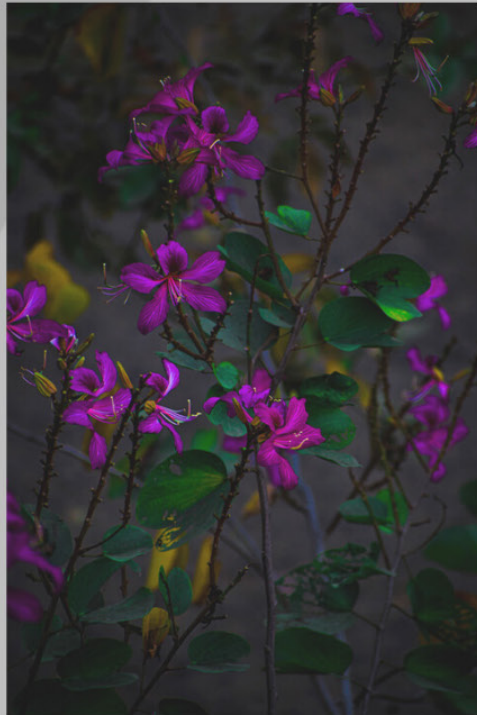
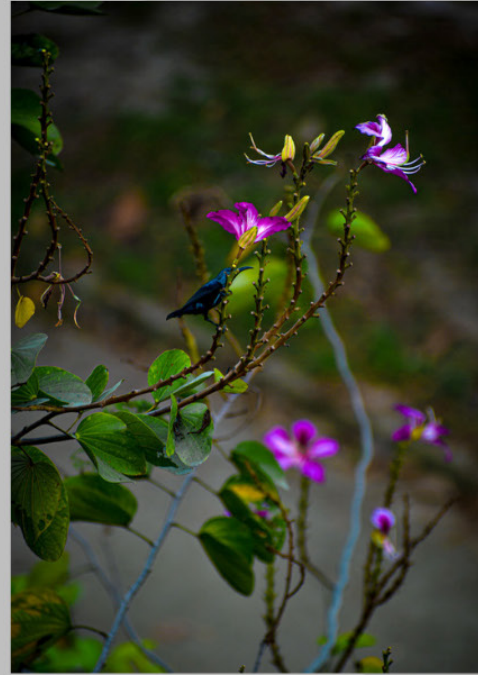


Cdt Raja Ram
4th year MRE



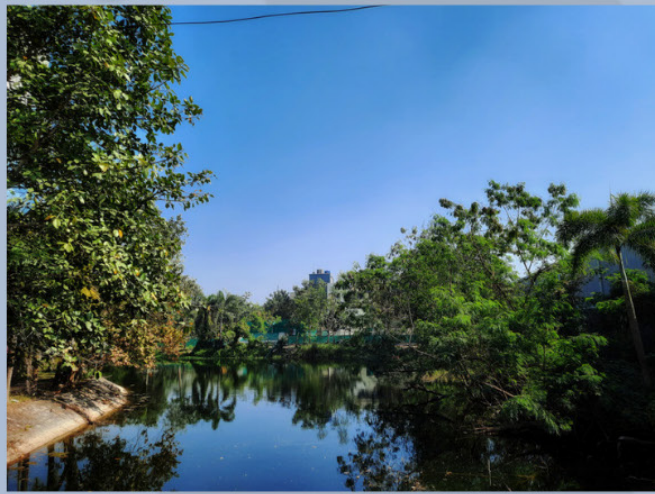


*For rejoicing your memories
you need the lens by your side*

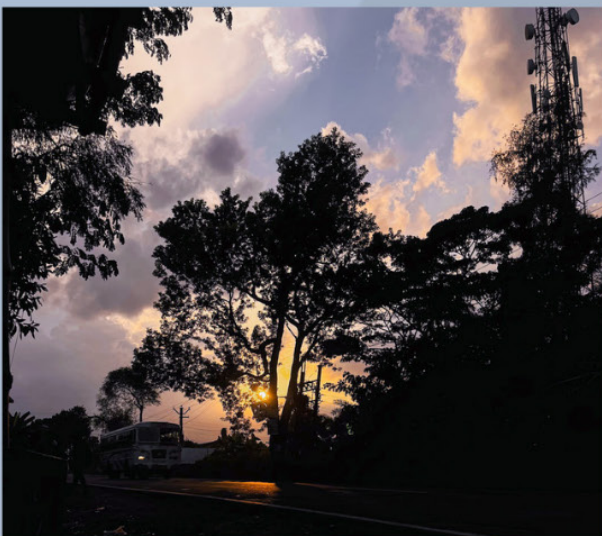


*Cdt Nasir Hussain Ansari
2nd year BNS*





Cdt MD Gulam Haider Mustaji
2nd year BNS



Cdt Nasir Hussain Ansari
2nd year BNS





OUR STRENGTH OUR FAMILY



4th Yr MRE (2019-23)



3rd Yr MRE (2020-24)



3rd Yr BNS (2020-23)



2nd Yr MRE (2021-25)



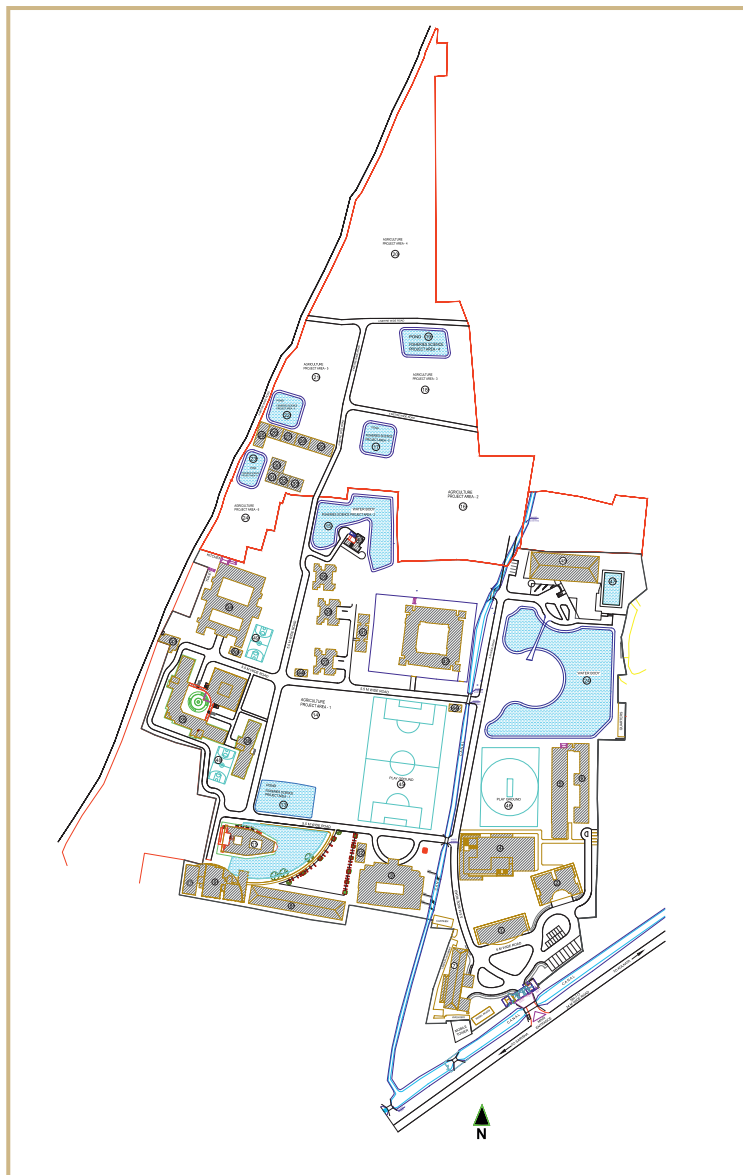
2nd Yr BNS (2021-24)



1st Yr MRE (2022-26)



1st Yr BNS (2022-25)



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

admadcommunications@gmail.com

