1. Modifications in design for IWT vessels

Cdt. Nitin Sawarn

Marine Engineering and Research Institute (Kolkata)

Abstract:
This paper attempts to assess the viability of movement of passengers and freight by inland water transport (IWT) in India. The report highlights the design of concepts for container and bulk cargo transport. These concepts fulfill contemporary ecological demands, apply innovative technologies, and obey the existing waterway restrictions. The designs proposed are self-propelled vessels for container transport ssssand barge train for bulk cargo transport.

2. Sagarmala Project – Complexities & Opportunities

Cdt. Bhagyesh G Gadkari, Cdt. Shubham Chaurasia,MANET,Pune

Abstract

Sagarmala Project was originally mooted by the National Democratic Alliance (India) Government under Atal Bihari Vajpayee in 2003. The program aims to promote port-led development in the country by harnessing India's 7,500-km long coastline, 14,500-km of potentially navigable waterways and strategic location on key international maritime trade routes. The project was expected to reduce cost and time for transporting goods, benefiting industries and export/import trade as 90% of World trade is carried by sea. Under Sagarmala Programme, 415 projects, at an estimated investment of approximately □7.98500 lakh crore, have been identified across different themes over the period 2015 to 2035.

3. SAGARMALA-Overview, Vision and Benefits

Cdt. M.Vinay , Cdt. P.Yuva Kishore

Vels University, Chennai.

Abstract:

SAGARMALA is a central government programme launched by Ministry of Shipping in Karnataka for port modernization and developing its infrastructure. By transforming existing ports into world class ports which reduces the cost and time for transporting goods by using waterways, which is beneficial for industrial growth and EXIM trade and boost in GDP is expected in next twenty years. NSAC (National Sagarmala Apex Committee) not only deals with industrialization but also creates employment for many coastal communities. This 120 billion USD project is expected to develop India logistically by increasing volume of inland water ways and coastal shipping. This programme also helps in reduction in fuel consumption and cost reduction compared to transport on wheels.

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4. Integration of inland waterways in transport

Capt Rohit Yadav, Capt Azhar Alam

College of Military Engineering, Pune

Abstract

Transportation is the single largest component of cost for any company. Transportation is key to existence of any organisation as it delivers the product in the hands of customer. Supply Chain Managers have to do a fine balance between cost of transportation and service levels. One of the important decisions in transportation is selection of mode of transportation. Inland Waterways Transportation (IWT) is the mode of transportation within a country where cargo is moved over rivers and canals. As compared to road and rail, IWT is more fuel efficient, environment friendly, less capital isssntensive, safe and possess least

external costs. In spite of carrying several advantages and being recurrently used in several countries, the spread of IWT in India is extremely poor. IWT does not contribute even 0.5 per cent of the total Indian freight transportation. The paper attempts to understand the Indian shipper's transportation service requirements and various factors which influence his choice of mode and how IWT in India can realign itself to meet these requirements. The paper provides some of the recommendations for IWT sector to evolve to meet the shipper's service requirements.

5. Man overboard detection and safety system

Cdt. I Kundu-Z U Rahman

IMU-Visakhapatnam

Abstract

Worldwide, the ocean cruise industry has an annual passenger compound annual growth rate of 6.63% from 1990 - 2020. Growth strategies to date have been driven by larger capacity new builds and ship diversification, more local ports, more destinations and new on-board/on-shore activities that match demands of consumers. A total of 13 new ships with passenger capacity of 33,379 will be added in 2018.

Man overboard is a situation where in a ship’s passenger falls out at sea from the ship, no matter where the ship is sailing, in open seas or in still waters in port. A seafarer has to be very careful while being onboard, as it can never be taken for granted that a person cannot fall off the ship due to bad weather, swell in the sea, accidents, and due to negligence during.

Many cases has been found where the person died because of being unnoticed after over boarding or the rescuer came after a long span of time within which either he was drowned or died due to other reasons.

The proposed system consists on an IR Opto Coupler which consists of a light emitting and light detecting plate with no connection in between and an LPS. The basic principle is that any breakage in this circuit will raise the alarm after which measures can be taken accordingly along with real time tracking of the passenger.

Installation of such system will just require projections at certain intervals on the ship. This can be achieved at minimal cost. By this installation the 'Man Overboard' can be brought to notice making the rescue easy.

6. Artificial Intelligence with Virtual Reality: "Next leap of faith for MIT's"?

Cdt. T Ram Shakkthivel

HIMT College, Kalpakkam, Chennai

Abstract

All kinds of industries are taking baby steps towards VR & AI technology. It looks like the VR& AI technology will mature in future to set a trend. Also, stay in industries quite a long period of time. Maritime industry has taken initiatives to bring up safe working practice, blue revolution, safety of seafarers and machine intelligent training for operating of the new technology in industry. The paper briefly discuss about the traditional training followed from past to e-learning at present. In this kind of conventional training the grasping power of trainees differs from student to student. So the world is developing its technology rapidly and the youth of today are very much interested in handling electronic gadgets. If this point is taken into consideration, by training the students with AI & VR equipment, comparatively the knowledge gained by the students will be more to conventional training. So, below we have discussed how the new technology growing up in other

industries could impact the shipping industry as well as – Maritime training institutes (MIT's).

7. AUTONOMOUS SHIP

Cdt. S Thapliyal, Cdt. Sandeep, Cdt. Usman
Anglo Eastern Maritime Academy, Karjat

Abstract

Shipping industry is always subjected to evolution. From using sails for propulsion to fuel cell propulsion. Now, autonomous shipping is the future of maritime industry. As, disruptive as smartphone, the smart ship will revolutionize the landscape of ship design and operation. A ships ability to monitor its own health, establish and communicate what is going around it and make decisions based on that information is vital to the development of autonomous operation. The need is to develop a set of electronic brain which allow to navigate safely and avoid collision. As per statistics, 80% of ships mishaps happen due to human element. Autonomous ship will not only eliminate this drawback but will also reduce the crewing cost. Hence, our focus will be on advancement in autonomous shipping, the challenges and their remedies.

8. Flettner Rotor- Paving The Road Ahead for A Cleaner Shipping Industry

Cdt. S Banik

Tolani Maritime Institute, Induri

Abstract:

Flettner rotors are vertical cylinders which spin and develop lift due to Magnus effect as wind blows across them. Flettner rotors need to be mechanically driven in order to develop propulsion power, and manoeuvrability is restricted by wind speed and direction. The force

created inside the rotor cylinders generates the thrust. The Flettner rotors were first implemented by Anton Flettner on board a ship at the beginning of 1920's but not much advancements have been done in this technology. Flettner rotors can considerably reduce energy consumptions of a ship as an alternate propulsion system.

9. Exhaust Gas Emissions Today and Tomorrow

Cdt. A Kumar, Cdt. Y P Singh

Vels University, Chennai

Abstract

Quite a number of emission control measures have already been developed, and are in use today. Emission control has turned into the most important driving force for development.

Hence, this is an area to which extensive development effort is allocated. This emphasizes both NO_x control, SO_x limitation, particulate control and, to an increasing extent, CO2 emission, the latter reflecting total engine efficiency. With CO2 considered a greenhouse gas, the CO2 concentration in the atmosphere is looked at with some anxiety. In any case, the low speed diesel is the heat engine available for ship propulsion with the lowest CO2 emission. This is possible simply by virtue of its high thermal efficiency. However, we still see possibilities of increasing the efficiency by means of waste heat recovery and achieving a total efficiency of the fuel energy used of up to 60%! This will not only reduce the CO2 level, but also the amount of emissions of NOx, SOx, PM, CO and HC.

10. A review of fuel cell systems for maritime applications

Cdt. M Ahuja, Cdt. V Divekar, Cdt. R Ghose

VMI,Pune

Abstract

Progressing limits on pollutant emissions oblige ship owners to reduce the environmental impact of their operating vessels. Fuel cells may provide a suitable solution, since they are fuel efficient as they emit few hazardous compounds. Various choices can be made with regard to the type of fuel cell system and logistic fuel, and it is unclear which have the best prospects for maritime application. An overview of fuel cell types and fuel processing equipment is presented, and maritime fuel cell application is reviewed with regard to efficiency, gravimetric and volumetric density, dynamic behaviour, environmental impact, safety and economics. It is shown that low temperature fuel cells using liquefied hydrogen provide a compact solution for ships with a refuelling interval up to a tens of hours, but may result in total system sizes up to five times larger than high temperature fuel cells and more energy dense fuels for vessels with longer mission requirements. The expanding infrastructure of liquefied natural gas and development state of natural gas-fuelled fuel cell systems can facilitate the introduction of gaseous fuels and fuel cells on ships. Fuel cell combined cycles, hybridisation with auxiliary electricity storage systems and redundancy improvements are identified as topics for further study.

11. The management and their innovative utilization of ship generated waste onboard ships – a peculiar reduction in pollution

Cdt. A Ankit, Cdt. A Giri

Tolani Maritime Institute, Induri

Abstract

Humans have always had a close relationship with the aquatic environment, including the early use of the sea for food harvesting and communication .Today, the sea is an important component of the transportation system with large amount of cargo and passengers. But due to increasing scale of transportation through seas, there is sudden rise in level of pollution by generation of different types of solid and liquid wastes. Therefore, this study constitutes an empirical overview of the management drivers, technologies and quantities of different categories of ship generated waste.

For almost every type of ship generated waste, there is a variety of waste flows and onboard treatment methods. Therefore, I considered three major operators of waste generated by ships: - i) Oil Bilge Water ii) Oily Residues (Sludge) iii) Incinerator Ashes. Operational discharges from ocean going vessels that includes discharges of Bilge water which releases oil into Marine Ecosystems that can potentially damage marine life, terrestrial life, human health and the environment. It is a mixture of oily fluids and other pollutants from a variety of sources onboard a vessel. If it cannot be retained onboard, it must be treated by an oily water separator before discharge for larger ocean going vessels. Similarly, oil residues (sludge) are the waste from the purification of fuel or lubricating oil or separated waste oil from oil water separators. It can be treated by an incinerator. Prior to incineration, a heating system (Evaporator) can be used to evaporate the water fraction of sludge. Also ships can be equipped with incinerators to burn sludge, domestic operational waste and other types of wastes. The

resulting incinerator ashes are stored separately. It can be treated further for extracting carbon contents by installing unit called cyclonic static micro bubble flotation column and can be supplied to port reception facility. The extracted carbon can be utilized as a fuel for carbon dioxide extinguisher and many more purposes onboard ship.

The basic scope of study is to provide a comprehensive review of the present technologies and methods being used to reduce ship generated waste produced by ships. Therefore, we emphasize that promotion of waste management offers a powerful tool to provide opportunities and incentive schemes for policy makers to put a GREEN BEACON at the horizon of 21st century shipping!

12. Effects of dredging on environment

Cdt. R Adhikari, Cdt. S Pal,Cdt. S Siddhpura,

The Great Eastern Institute of Maritime Studies-Lonavala

Abstract

Dredging is an excavation activity or operation usually carried out at partly underwater, in shallow seas or fresh water areas with the purpose of gathering up bottom sediments and disposing of them at a different location. This technique is often used to keep waterways navigable.

It is also used as a way to replenish sand on some public beaches, where sand has been lost because of coastal erosion. Dredging is also used as a technique for fishing for certain species of edible clams and crabs, see fishing dredge.

A dredger is any device, machine, or vessel that is used to excavate and remove material from the bottom of a body of water. For example, a scoop attached to the end of a rope or pole by which a man can draw sediments up from the bottom of a pond is a dredger. This basic idea was further developed into a motorized crane equipped with a drag bucket or

clamshell (grabber) that is used to scoop material from the bottom of a body of water is also a dredger. The crane could be located on the bank, or perhaps mounted on a barge. If the crane is mounted on a barge, the entire vessel is referred to as a dredger.

The process of dredging creates spoils i.e. excess material, which are carried away from the dredged area. Dredging can produce materials for land reclamation or other purposes usually construction-related, and has also played a significant role in gold mining. Dredging can create disturbance in aquatic ecosystems, often with adverse impacts. In order to ensure that the process of dredging is carried out without any debilitating effects, it is important to use the right dredgers. It has been recommended that those dredgers which present a chance for pollution and extensive contamination be avoided and replaced with other safer methodologies.

13. Hydrogen used as an alternative fuel

Cdt. K Mariadas, Cdt. R Vignesh, Cdt. N Raju

The Great Eastern Institute of Maritime Studies-Lonavala

Abstract

The concern for the cleaner air, along with stricter air pollution regulation and the desire to reduce the dependency on fossil fuels has resulted in the hydrogen as the alternate fuel for the use in the internal combustion, IC engines.

The automobiles, at present day use the products of fossil fuels. These have the main carbon molecule. This after combustion is converted into carbon oxides emissions and nitrogen and sulphur compounds are emitted as Sox, NOx, smoke, unburnt carbon and particulate matter.

Hydrogen gas fuel was considered as an alternate substitution for the petrol requirement, and also safe guard against the other emissions**.**

14. Yoreh Mitwa - An Electrochemical Rain Sensing Wiper

Cdt. P Chandekar

The Great Eastern Institute of Maritime Studies-Lonavala

Abstract

In this paper, we have investigated an electrochemical switch which is rain sensitive and independent of the electronics of the vehicle. Also, a lot of electrical components are involved in electrically operated rain sensing wiper, hence, there is always a chance of short circuit since the system deals specifically with water as medium. As a result regular inspection and preventive maintenance prove to be crucial for it as compared to our wiper which is eco-friendly and offers high reliability. In this paper, we have compared our electrochemical based wiper system with other existing methods in literature.

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15. Ship energy efficiency management plan

Cdt. Chidambaresan, Cdt. R Tyagi

VELS University, Chennai

Abstract

In the modern Shipping we are concerned with sustainable and environmental friendly transportation of goods through ships. Thus, saving of fuel is the main prospect to meet all the environmental challenges faced by modern Shipping industry . SEEMP or Ship Energy Efficiency Management Plan provide various measures and aspects to save fuel in each of the systems which are contributing towards propulsion of ocean going vessels. Therefore we are here to create an environmental awarenessss.

Energy saving technologies keep improving faster than they are applied, so efficiency is an ever larger and cheaper resource available.

As far as shipping is concerned the objective so far was : Safe ships & Clean oceans. As world is upgrading the vision of IMO at present : Safe, secure, environmently sound, efficient and sustainable shipping through co-operation. Which is now achieved by SEEMP as an energy efficient tool for ship owners.

Going through the content we deal with how SEEMP being applied on ships with case study and with energy analysis of MAN B&W engine, ending with conclusion and references

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16. Handling of hazardous materials in ship recycling

Cdt. B Juluru, Cdt. V Vempaty

Anglo-Eastern Maritime Academy, Karjat

Abstract

In a basic life-cycle of a ship, after designing, manufacturing and operating stages recycling is also important aspect. Brief introduction about recycling of ships is discussed. Under the stages of recycling, disposing of hazardous materials which can effects environment drastically and is listed as a one of the major problem facing in the maritime industry. Disposal of hazardous materials based on the regulations made by Hong Kong convention is discussed. Mandatory Maintenance of inventory for hazardous material is discussed. Brief description on hazardous materials found on ships are mentioned along with sampling tests of the particular hazardous materials.

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17. Innovative Approach in Transportation- An Industry Life Line

Emerging Trends in Robotics, Navigation and Communication

Cdt. Akshit singhania Cdt. Ansh Mehta,Cdt. A.Vishal

TOLANI MARITIME INSTITUTE

Abstract

The development of techniques for autonomous navigation in real-world environments constitutes one of the major trends in the current research on robotics. An important problem in autonomous navigation is the need to cope with the large amount of uncertainty that is inherent of natural environments. Fuzzy logic has features that make it an adequate tool to address this problem. In this paper, we review some of the possible uses of robots in the field of autonomous navigation. We focus on following topics: what is robots, what is slam robots, rov sensors, e-navigation, Arctic communication and so on.

18. Sagarmala project: complexities and opportunities

Cdt. Naman Gupta, Cdt. Manav Mishra , Cdt. Naman Saxena

TOLANI MARITIME INSTITUTE

Abstract

A robust maritime logistics with efficient port infrastructure can be a strong catalyst for economic development. Indian maritime sector is infested with no. of hurdles in relation to developmental, procedural & policy related challenges. We have studied about the Sagarmala project which is proposed by the government of India in the year 2015. It's a long term project which has a very high favorable outcome with a structured plan. We have looked into this project and thought about the few amendments that can be made for a more accurate work plan. It basically aims for the growth of the maritime sector by connecting six major ports of India for better trade and import export. Taking such a big step towards the development of import and export, there are some complexities that needs to be addressed. We have formulated some solutions for the complexities mentioned in the paper and also listed the

opportunities which the Sagarmala project will create for the blue world. This will ensure the smooth and efficient working of the project with better outcome.

19. The sagarmala project

Cdt. MRINAL JHA, Cdt. NAVNEET AWASTHI

TOLANI MARITIME INSTITUTE

Abstract

Trade is one of the major thing which plays an important role in country's GDP (Gross Domestic Product). India is seventh largest nation of the world and is surrounded by sea from three directions, which makes it one of the biggest coastlines of the world. Considering such a vast coastline of more than 7,500 Km India should ideally do more than 90 per cent of its import- export through sea, which is not how it happens and thus there is a huge gap in what we have and what we are currently doing.

Ironically, the ports contribute to just 1 per cent of the entire GDP, whereas the road sector contributes 6 per cent and railways 9 per cent towards the GDP. There is a huge contradiction in what we can do with our coastlines. If we identify as to what is the reason for such a poor contribution of ports towards the GDP, we would find that it is nothing but inadequate linkage of ports and poor infrastructure, which leads to such a meagre utilization of ports. So it is very important and the right time that our Indian Government implemented this project towards "blue revolution", which is Sagarmala Project.