POTENTIAL OF INDIAN INLAND WATERWAYS

A revolution in shipping

UNMANNED SHIPS

La Ola

September 2014

A new addition to the Indian Navy

INS KAMORTA

ISSUE XVII

Contents

From the Chief - Editor's Desk

LaOla takes pride in releasing the seventieth edition. This edition is marking its glory by being the first edition of this academic year. ***Prof. S C Misra*** our beloved Director who had the vision of having an E-magazine in the campus conceptualized this news letter in the year 2010. Since then this vision was nurtured by and has successfully released 16 new letters.

My team and I were bestowed upon the job of carrying it forward through the academic year 2014-2015. As the magazine has made considerable movement it will be easy for our team to move for-ward under the guidance of our beloved Director in Charge ***Dr. U.S. Ramesh*** and editorial advisor ***Mrs. Padmasree***.

I thank ***Mrs. Padmasree*** for helping La Ola to form a new team and help the team tackle the problems faced by a new team.

The year 2014 has brought in new changes in university ***Mr. Ashok Vardhan Shetty*** has taken over as the vice chancellor of our University.

Our director in charge has brought new faculties in different departments marking the growth of our campus in terms of the knowledge which they will impart. He with combined and valuable efforts of our Placement Co-coordinator ***Mr. D.S.P. Vidyasagar*** and our academic Coordinator ***Mr. B.V. Rao*** used their ability and contacts to get the Final year students placed in companies like Mazagaon Dock, Class NK, Vedam, Intergraph, Bharti Shipyard, Pipavav Shipyard, Dharti dredgers, Keppel Offshore, Dredging corporation of India . La Ola expresses sincere gratitude to all these institutions for accommodating them as a part of their family.

The new batches of students have joined the campus and in terms of the freshness the fragrance is everywhere. Team La Ola welcomes each and every student. You are going to be groomed by the best of the faculties and above all you will be proud to say that we are students of Indian Maritime University.

This month being September we are reminded of our teachers and as we celebrate teachers day lets pray for their good health and thank them for teaching us the values and principles of life & making us who we are today. La Ola being a campus magazine you have an opportunity to put forth your wonderful ideas and develop the creativity of writing too. Hence use the space of La Ola to exhibit your valuable thought provoking talents. Through this edition of La Ola, we present a wide spectrum of knowledge & information. After the Indian Budget and a special project of our Prime minister ***Shri Narendra Modi*** a topic has suddenly rose to headlines "Inland Waterways" being a naval architect, it is both interesting & important to understand the Indian Inland waterways, keeping that in mind, we present a issue on' The potent of Indian Inland transportation'. A comprehensive study on Unmanned ships and an article for our young generation, this issue is overflowing with snippets that will make you ask for more. The La Ola team is committed to give its readers the best of the available talents of this campus.

We thank our beloved Director-in-charge ***Dr. U.S. Ramesh***, former chief editor ***Swastik Pattnaik*** and the university for having faith in us to carry forward the work for La Ola. La Ola is on Facebook too, follow us there.

What you see is a beginning.....'picture abhi baki hai'.

Enjoy Reading!!

Tarun Tripathi

POTENTIAL OF INDIAN INLAND WATERWAYS

It is found that there are great variations in the importance of Inland Water Transport (IWT) from one country to another. This discrepancy can be explained to a certain extent by geographical conditions, but lack of realization of the potential benefits to the national economies also plays an important role. Some countries - especially the oil importing developing countries are now making determined efforts to expand and modernize their waterways transportation systems, but generally there is a lack of national master plans for transportation, including inland waterways, so their development is still taking place on a

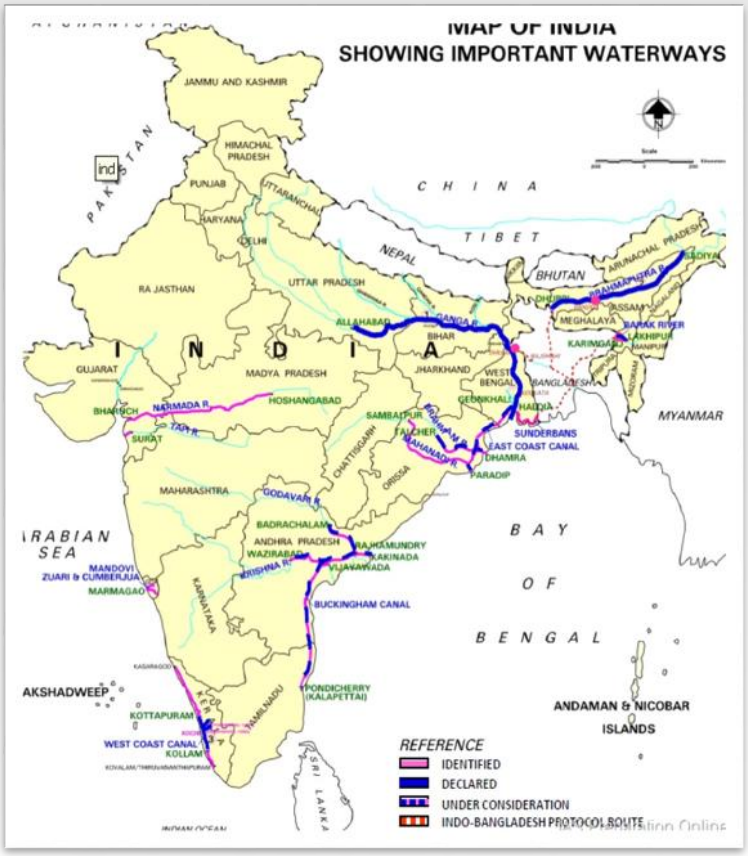
piecemeal basis.

Currently, three waterways have been declared as National Waterways:-

- **National Waterway No.1**:- The Ganga between Allahabad-Haldia (1620 km) in UP, Bihar, Jharkhand and West Bengal;

- **National Waterway No.2**:- The Sadiya-Dhubri stretch of river Brahmaputra (891 km) in Assam; and

- **National Waterway No.3**:- The Kollam-Kottapuram stretch of West Coast Canal along with Champakara and Udyogmandal Canals (205 km) in Kerala.



In India, the Central Government for many years has neglected the inland waterway System, and the necessary funds for improving the waterways were not available. Several years ago a special agency was set up for waterway transport (Inland Waterway Authority of India) under the

Ministry of Shipping with the aim to develop a number of national waterways and bring them to specific design standards. This includes the main waterways such as the Ganges and the Brahmaputra.

The development plan is laid down in the National Plan for Ports and Waterways.

Transport economics presupposes that moving large volumes in big vessels can achieve cost-efficiency. One wonders if the lock gates at Farakka are wide enough to allow ingress and egress of large vessels. There is a proposal to transport coal along the NW1 for NTPC's 3300-MW super-critical thermal power plant being set up at Barh, near Patna and the annual requirement of the plant, when fully operational, is estimated at 16 million tonnes. Various alternatives are now being examined as to how to bypass Farakka lock gates to transport coal, even if it means additional cost. The falling river draft north of Farakka is also a matter of concern.

The rivers identified for the proposed routes, being deltaic, meander a lot and, therefore, their flow is sluggish. The river route kilometre is more than the land route kilometre, rendering the system cost higher. This poses a major challenge to river transportation. The assessment of proper river draft becomes difficult unless the survey mechanism is changed from the present bottom-scanning to side-scanning, according to

NAVIGATION PROBLEMS

There is another point. The scheme which, at present, is being actively pursued is unloading of imported coal at a place closer to the sea from a huge bulk carrier into a large ocean-going barge for transportation along the NW 1 to meet the requirement of NTPC's Farakka plant immediately, and of Kaholgaon plant gradually. Can a large ocean-going barge really navigate along a meandering river? It will be like a huge, overloaded truck trying to make its way through a narrow lane.

To overcome the hurdle, coal has again to be unloaded from a large barge into a smaller barge, entailing multiple handling and, therefore, additional cost.

More than the limited draft, it is the wide variations in the draft, particularly between Haldia and Farakka, along the NW1, which cause concern. There are stretches in the NW1 where the draft is as high as six metres but there are also stretches where it is as low as 1.8 metres or so. Low draft, even over a very small stretch, can stall a barge. Other problems, such as non-availability of navigational aids and absence of buoys and lights and channel markings, though important, are not insurmountable.

Finally, the IWT as a mode of transportation should not be considered in isolation. It should be integrated with other modes to achieve optimum benefits for the national economy. For this, Central-level coordination is urgently needed.

LEARNING FROM THE CHINESE

In China there is a clear policy to further stimulate the share of IWT and to improve the interface between IWW and other modes especially sea-ports and rail. In China a three level civil administration is in charge of the IWT management. At the top level the Ministry of Transport (MoT) develops sectorial policies and infrastructure planning. On a next level the River Administration is responsible for the implementation of IWT projects on the country’s main inland waterway transport link along the Yangtze and Pearl River. On the third level the provinces themselves implement IWT projects. The strategic objectives in China include the promotion of an efficient waterway fleet utilisation; furthermore the extension of the Class III inland waterway system by 65% (in terms of km), from 8,687 to 14,300 km, and the Class V by 50% (from 24,000 to 36,000 km) by 2020. Programs include a long-term waterway development plan to 2020, a vessel standardization program and a framework concept for an integrated river information system.

The Chinese inland waterway sector has seen enormous increases in volumes on the main rivers such as the Yangzte River. Infrastructure programmes have focused at developments of new port and upgradings of existing ports, improvements in navigation channels (including the development of side rivers), and the development of supporting systems like GPS, VTS, RIS, digital charts, in main river areas (especially along the Yangtze River).

The Chinese has developed plans and strategies for:
_ privatization in inland shipping and port construction and operations
_ barge standardization programme: set up a scrapping system including subsidies for innovating the fleet
_ incentives: local government deduct fees for pre- and end haul transport to/from the inland terminals. Subsidies are possible to set up new shipping routes (in start-up phase)
_ development of an IT platform for terminal operating systems to increase the efficiency
_ develop connecting infrastructures to inland ports
_ the tax-system for inland vessels (fixed tax) is changed into a fuel fee-system, which is considered to be a fair system by the operators.

Furthermore there is an ongoing cooperation between China and foreign partners, such as the Netherlands, the European Commission, and projects are being developed with international financing institutions such as the World Bank and the Asian Developments Bank. The cooperation with the Netherlands is ongoing for many years and has developed from basic master planning and infrastructure support, into state of the art projects in the field of efficiency improvements and increasing the safety and environmental standards. At present pilot and demonstration projects are ongoing in the field of:

_ The technology for (chemical) spills monitoring and emergency response
_ Ship design and building technology
_ E-navigation
_ Internationally recognized safety/green certificates
_ Human resources development in the field of the transport of dangerous cargoes
_ Waste management in inland shipping

The modal share increase for IWW in China and high volumes of freight transported on the waterways demonstrate the effectiveness of the Chinese IWT policy strategy. The achievements which were realized through the national plans and foreign co-operation programs may serve as an example to improve the level of IWT in Brazil and India.

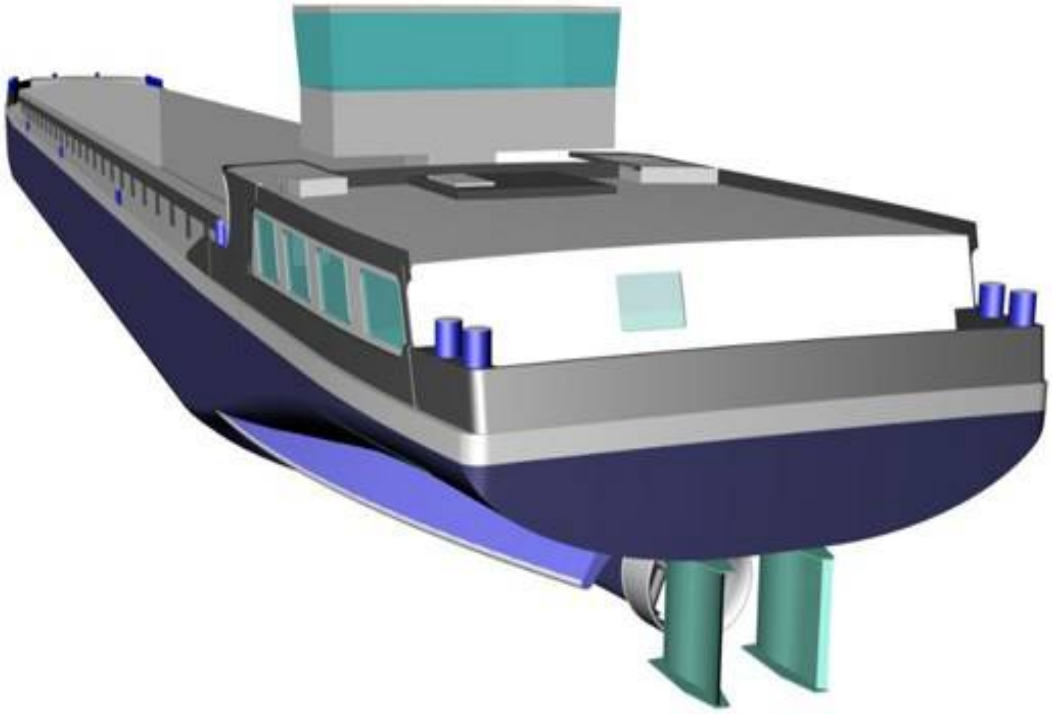
BRAZIL

The Brazilian MoT is currently setting up a strategic waterway plan (Plano Hidroviário Estratégico). This represents a first step in designing a national strategy for IWT in Brazil. Brazil has numerous waterways but limited commercial use of the waterways. The truck sector dominates the transport scene, but more and more the federal and state governments realise that alternatives are needed, especially bu making more use of the countries waterways. The strategic waterway plan is a first attempt to tackle the issue on the national scale, and to bring the waterway sector policy and plans more in line with the other modes of transport, that have already been included in detail in the National Plan for Transport and Logistics. On the state level, initiatives are taken by the state government to stimulate the use of the waterways for transport. A good example is the state of Rio Grande do Sul, which has developed a master plan for inland waterways transport, followed by demonstration and pilot projects. A first result is the first regular container service in Brazil between the seaport of Rio Grande and the Port Alegre. Also in other areas there is cargo potential, but a modal transfer needs support from government bodies. An important development in Brazil is the construction of ship locks when dams are built. This addresses the frequent problem that infrastructure projects prioritize the construction of dams for hydro energy without integrating ship locks, and thus blocking the development of inland shipping. An important pilot project is nearly finalised in the Tocantins area in the north of the country, where a lock complex is integrated in the dam, opening new possibilities for inland waterway transport. However, a stimulating policy from the government is needed to attract shippers and operators.

LEARNING FROM OUR MISTAKES

Incentives that have been developed for the Chinese inland shipping sector include
subsidy schemes for new services, lower fees for pre- and end-haul transport to and from inland ports, a scrapping/subsidy scheme to replace old vessels by new vessels according the barge standardisation programme, and by providing ICT support systems for better vessel management leading to increases in efficiency through higher utilisation, and a smooteher inspection system where the inspection regime for 'quality ships' will be lower.

NEW INLAND WATERWAYS SHIP CONCEPT



The Mercurius Shipping Group, located in Zwijndrecht, the Netherlands, has developed a new concept for a clean inland waterways cargo ship. Called the "M-factor," the vessel is powered by Volvo Penta marine diesel engines both for propulsion and for the bow thruster .The ship is 85 meters long, 9.6 meter wide and has a load capacity of 1,500 tons, and is a relatively small ship with a very large cargo hold. The size of the ship and its limited height enables it to sail in almost all European inland waterways. As it is mainly designed for the smaller channels and rivers it will use a 750 hp Volvo Penta D16-750 hp as propulsion engine. Usually this size of ship would be equipped with an engine producing at least 1,000 hp.Mercurius has been searching for the most fuel efficient engine at part load. In this application, the engine will be operating at part load for at least 80-90 percent of running time.On part load, the Volvo Penta D16 outperforms the competition in this power range and was thus selected as main propulsion engine.
To reduce emissions, the engine will be equipped with the STT Emtec SCR and POC filter system as a standard even though this is still not required by legislation. The SCR system cuts NOx by 70 to 90 percent and the POC filter reduces the PM by 40 percent.The prototype will be built at Mercurius Shipping's own shipyard in Begej and will be ready in May 2011. The plans are to build at least 4-6 ships yearly, depending on the success of this unit. A contract for the second ship has already been given to the Volvo Penta Center Terlouw in Rotterdam. It will deliver the main propulsion engine D16-750, Twin Disk gearbox TD-5170 and SCR system as a complete package to the Mercurius Shipping Group.A Volvo Penta D12-400 will be installed as a thruster engine. The thruster will be delivered as a complete package including engine from the local manufacturer, Verhaar thruster systems.

IWT is considered to offer many advantages, both on the societal level as on the commercial level. Advantages on the societal level can be found in the field of lower energy use, lower emission standards, higher safety levels, safer transport of dangerous cargoes, and lowering the increase of truck transport thereby creating a positive effect on road congestion. These advantages are acknowledged worldwide and proven in many studies and reports, and for that reason this mode of transport is a priority mode in several countries and on the international level, e.c. in the European Union.

Commercial viability of waterways is proven by the huge amount of goods transported on the waterways in countries like the Netherlands, Germany, China, and the USA. Not only for bulk transport, but also higher value goods packed in containers are more and more transported on the waterways because of the economic benefits.

WAKE EQUALIZING DUCT

Hydrodynamic upgrading device - Wake equalizing duct (WED) is a ring-shaped flow vane with foil-type cross-section fitted to the hull in front of the upper propeller area. In contrast to the Kort nozzle, which shrouds the propeller, these ducts are less than half as big in diameter and section length and are arranged in the wake. They are fitted to the hull in the form of two half-ring ducts in front of the propeller during the construction of bottom after body section. Their upper ends may be integrated to the hull ahead of the stern frame or they may extend into the stern aperture. WEDs consist usually of two centro-symmetric halves which are connected by straight foil type parts to the hull. The duct is most effective on huuform with larger curvature of the waterlines at aft.

The basic principle underlying the application of this device is that the flow creates a circulation around the foil section of half-ring ducts which accelerates the flow in the area enclosed by them and retards it in their outer ambit. Thus, such a nozzle channels the flow in the upper quadrants where it matters most. The inward-directed circulation guides the water into the duct, and much ahead of it presses the flow on to the hull. The flow is then better attached to the hull and results in reduction of flow separation prior to the duct.

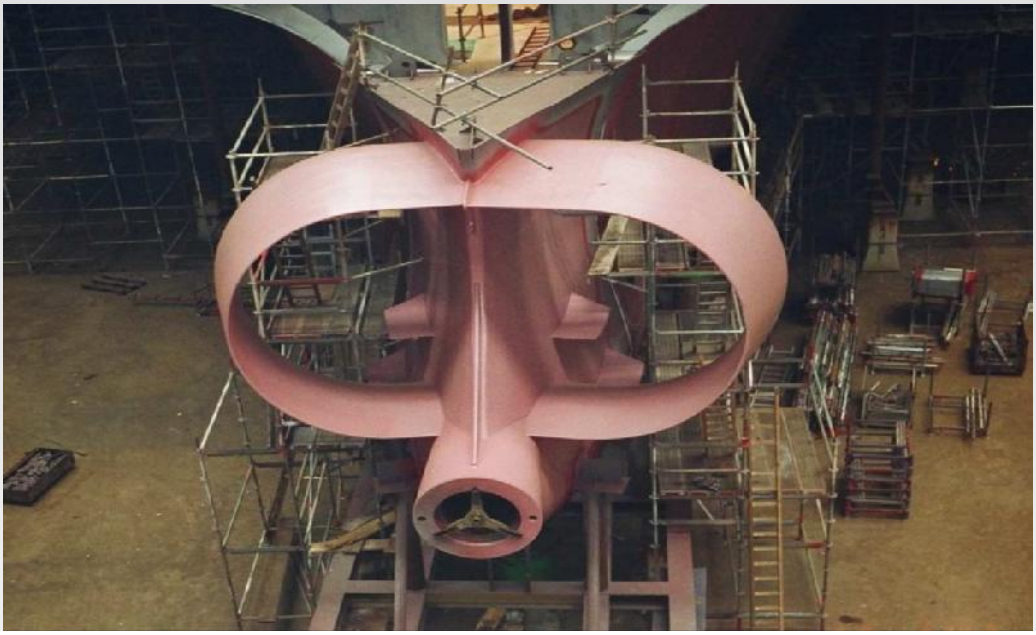


Fig. 1 - Wake Equalizing Duct

The WED is characterized by the following parameters:

Inner diameter (43–44% of propeller diameter)
Chord length (50–70% of inner diameter)
Profile section shape (special, not corresponding to any standards)
Angle of outline cone
Angle of axis of half rings against the longitudinal and transverse planes of the ship, which have different settings for port and starboard sides
Distance of axes from each other—taken at the exit plane
Distance of WED from propeller.

A normal longitudinal section (Fig. 2) across the duct explains the circulation effect relating to the speed distribution in the upper and lower halves of the propeller. The inflow of the propeller is accelerated in

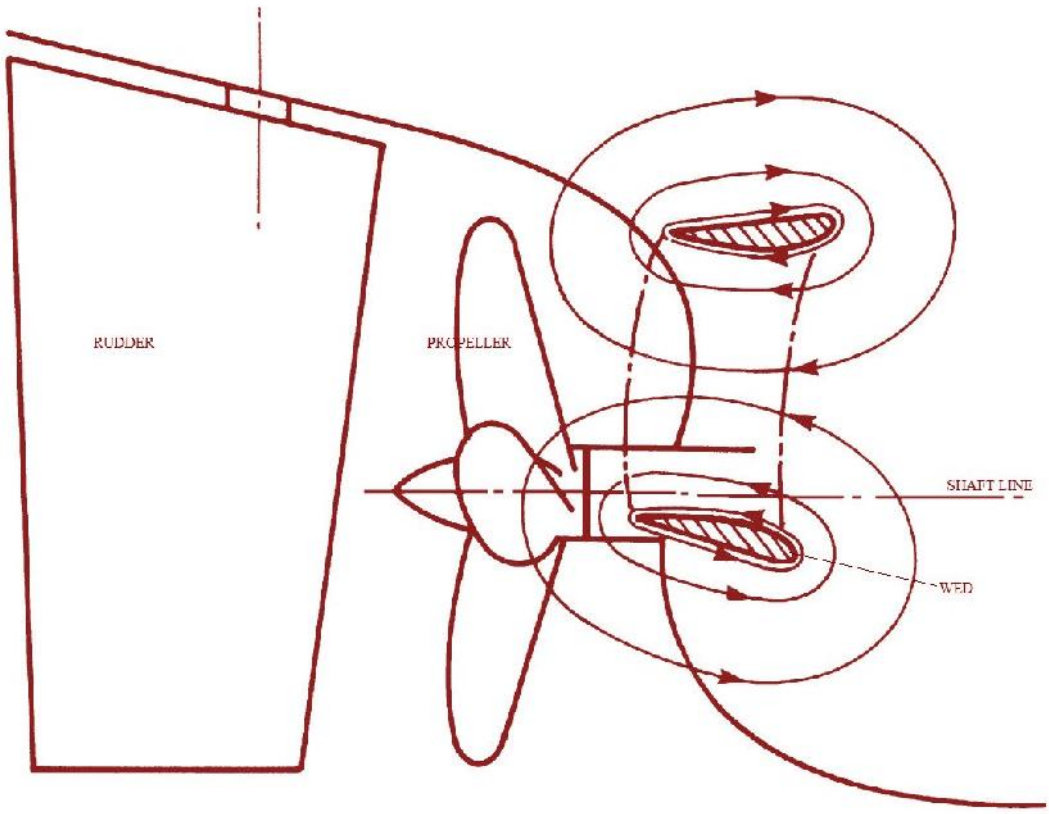


Fig. 2 - CirCirculation in vertical direction

the upper region where it is slow, corresponding to the fuller form of the ship, and in the lower region, where the speed of inflow is normally higher, it will be retarded. In practice the average and effective wake will hardly be changed. In accelerating nozzles and ducts the open cross-section at the trailing edge is usually smaller than that at the leading edge. This often may not be so in WEDs. The flow in the WED region has divergent flowlines due to the ship hull form. The WED decreases this divergence by locally accelerating the flow in this region.

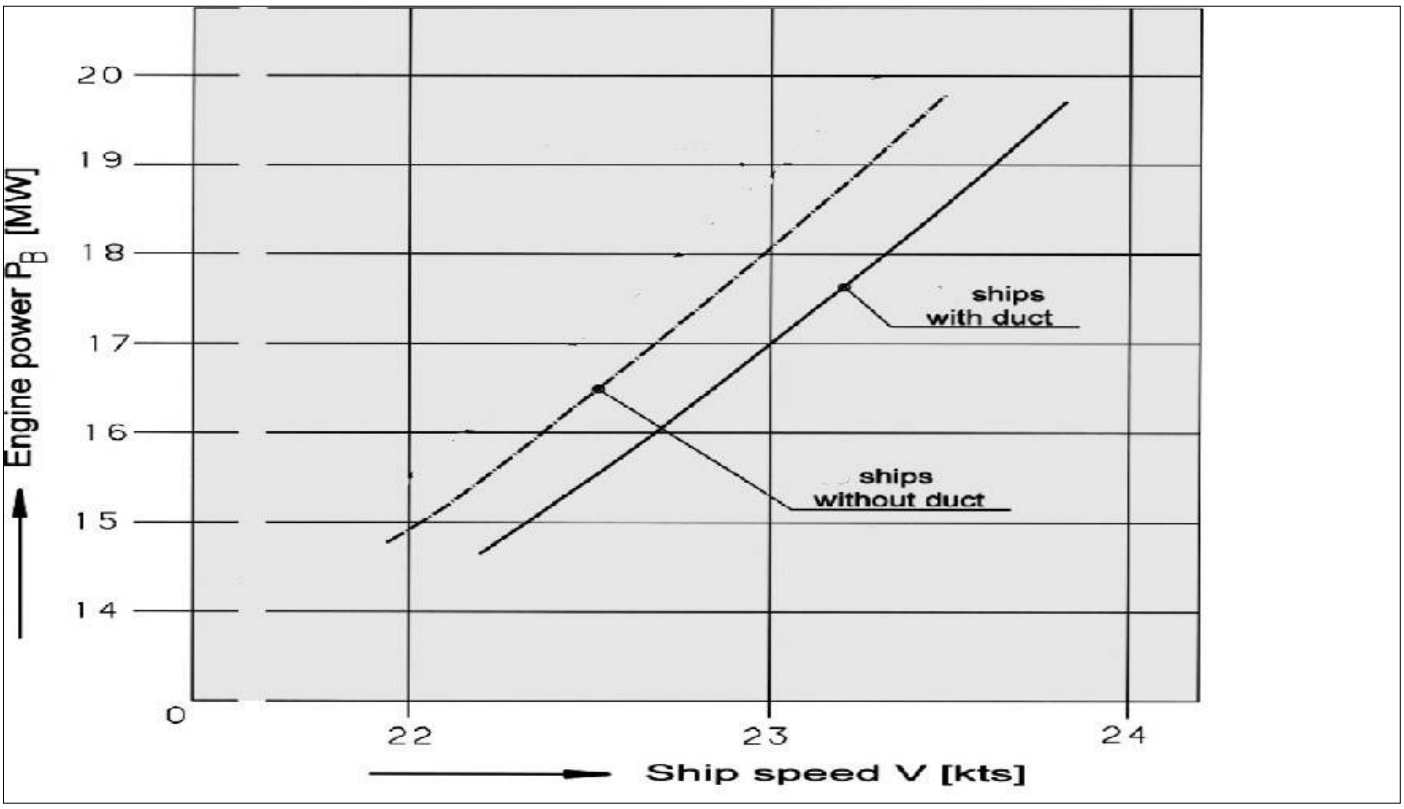


Fig. 3- Speed v/s Engine power

Advantages of application

The main advantage lies in power savings (Fig. 3) resulting from various effects:

1. Improved propeller efficiency from more dominating axial flow and more uniform velocity distribution over the disc area. The asymmetrical arrangement of half ducts gives a rotational direction to the water entering the propeller, which is opposite to that which the propeller will impart. Thus the loss from rotation energy in the propeller wake is less.
2. Reduction of flow separation at the aftbody. This effect is strong and reduces resistance and the thrust deduction fraction.
3. Lift generation with a forward force component on the foil section, similar to but weaker than that in the Kort nozzle.
4. The orientation of nozzle is such that the propeller inflow is given a slight pre-rotation which counteracts the propeller rotation.
5. Improved steering qualities from more straightened flow to the rudder. In spade rudders the longer upper sections become more effective because of the higher flow velocity.
6. Improved course-keeping ability from increased lateral plan area aft.
7. No constructional changes and no modifications in propeller design are involved when the duct is fitted to an existing ship.
8. Possibility to integrate devices for ice protection to propeller. Even without special ice protection, ducts protect propellers.
9. Reduction of propeller-excited vibrations from decreased propeller tip loading in upper quadrants to less than half the amplitudes. This allows reduction of propeller clearances in new designs. The WED also smooths the torque and thus reduces the tendency for torsional vibrations.
10. Unlike ducted propellers, imposing problems of tip clearances and cavitation, the WED does not pose such problems. With a uniform flow on to the propeller disc possibility of cavitation is reduced. The duct itself is less exposed to this problem than the rudders because of the considerably lower flow velocity in the wake at its location, which is often less than half the ship speed.

Cost aspects

In new ship construction, the costs of the duct can be lower than those costs saved by choice of a smaller engine, made possible by the power savings. Although the initial investment with fabrication and fitting is slightly higher, it can be recovered with power savings. The only added work will involve model test to be performed to determine the position for fitting of WED for effective performance.

The bases for evaluation of economic gains are expected power savings from comparative model tests or from experience gained from other vessels fitted with the nozzle. Data required for a preliminary assessment consist of hull lines fullness and details of the propeller and its configuration. In newbuilds, it is recommended that model tests be extended to include duct variants to determine the best arrangement and attainable gains, because these tests involve relatively low additional costs. For fitting to an existing ship, where a model has to be manufactured specially for this purpose, model testing can be rather costly.

Scope of application

The course of flow upstream of the propeller is characterized by areas with more or less pronounced flow separation which arise from the ship's form which gets finer towards the rear. It is at this point that the wake equalizing duct is placed, accelerating the water flow by its special configuration and directing it towards the area of maximum no uniformity in the propeller disc.

As a result the wake current is rendered more homogenous overall. Consequently, the setting of propeller blade profile better matches the effective admission flow across a major portion of the circumference and the propeller efficiency is improved. WED also provides a propulsion component by its favourable profile configuration and resulting circulating flow around the hull.

The extremely complex problems arising due to the configuration of an afterbody always necessitate compromises between multitudes of conflicting requirements. For instance, it is almost never possible to implement the optimum shape of frame in the afterbody which would be required to generate the optimum wake field because the main engine located far to the rear requires a certain breadth of ship deep down which hinders the most favourable line configuration. Further, an adequate displacement may have to be realized for counteracting the high mass concentration in this area and this may, in turn, be prevented by other restricting conditions. To conclude wake equalizing duct offers the opportunity of improving the compromise found in respect of speed and vibrations.

India and Japan took another step in strengthening their bonds in the maritime sector-Chairman and President of Class NK, Noboru Ueda visit to IMU Vizag Campus.

India's premier maritime university, Indian Maritime University Vizag campus, was visited by the Noboru Ueda, president and chairman of one of the world's leading ship classification society, Class NK .Class NK is a Japanese classification society started in 1899. Currently it has world's 21% shipping fleet under its purview. Mr Noboru Ueda is a veteran in the field of ship classification having spent more than 40 years with Class NK.
He has been on forefront with regards to the Research Activities in Class NK and maritime industry of Japan and was recognised with a "Lifetime Achievement Award " .
Mr.Ueda was warmly welcomed by Dr. U.S. Ramesh, Director of IMU Vizag campus, and Prof. S.C.Misra .Dr. B V Rao, Academic coordinator gave a welcome speech. Mr.Ueda spoke about taking maritime education in India to new heights by collaborating with Indian Maritime University Vizag campus. Mr Ajit Pradhan, regional head for Class NK in India was also present in the seminar and appraised the calibre and outstanding performance of the IMU Vizag campus students and faculty members who were present in the seminar.
After the visit of PM Shri Narendra Modi to Japan India and Japan are moving from emphasising shared values to jointly advancing shared interests, their ties already constitute Asia's fastest-growing bilateral relationship. Abe and Modi, however, wish to turn this blossoming partnership into a defining element in Asia's strategic landscape so that Japan and India serve as key anchors of a stable power balance. Abe's reassertion of the right of collective self-defence and his relaxation of Japan's self-imposed arms export ban have opened the path to closer military cooperation with India, including co-production of weapon systems. India — the biggest recipient of Japanese aid — has already become one of the largest destinations for Japanese FDI among major economies.

The two countries' dissimilarities actually create opportunities to generate strong synergies through economic collaboration. Japan has a solid heavy manufacturing base, while India boasts services-led growth. India is a leader in software and Japan a leader in hardware. India has the world's largest youthful population, while Japan is aging more rapidly than any other major developed country. Whereas Japan has financial and technological power, India has human capital and a huge market.

Japan clearly has an interest in a stronger, more economically robust India. Just as Japan assisted China's economic rise through large-scale aid, investment and technology transfers for over three decades — a role obscured by the recent flare-up of disputes — it is ready to help India become an economic powerhouse on par with China, a consideration that prompted Abe to pledge a whopping $35 billion in new assistance.

COULD COMPUTERS CAPTAIN THE WORLD'S FORESEEABLE SHIPS?

The most dominant transport modality is the marine transport as it is the most profitable, economical and is a highly effective method of transporting large quantities of goods. Due to which In today's scenario many commercial shippers have entered marine trade, and owing to the high competitions between traders and the strict regulations imposed for the protection of environment e.g. MARPOL COLREG there is a need for optimizing design standards reducing fuel costs. Crew cost is 44% out of total Freight cost hence this is a major factor influencing business competition. Owing to which many technological innovations are a need of today. Due to this Thought the concept of UNMANNED ships were started which reduced the operational cost Drastically.

Drone ships would be safer, cheaper and less polluting for the $375 billion shipping industry that carries

90 percent of world trade, Rolls-Royce says

The prospect of unmanned ghost ships navigating the world's sea-lanes remotely may sound like science

fiction, but the shipping industry has been seriously discussing the possibility for over 10 years.

HUMAN ERROR DATA AS OF TODAY

84-88%- TANKER ACCIDENT

79% - TOWING VESSEL GROUDING

89-96% - COLLSION

75%- FIRE AND EXPLOSION

CONCEPT OF UN MANNED SHIPS

Unmanned ships require Technology on board and ashore. Firstly, the autonomous ship itself is equipped with advanced sensor systems to detect and avoid obstacles. Furthermore, a positioning and navigation system to determine and control exact location, speed and course as well as route is also provided on board. The engine also requires advanced onboard control system to operate vessel and equipment

In addition to the vessel itself, a shore-side control center is also provided. This is where the autonomously operating vessels are monitored by qualified personnel. This center also needs to have the capability to assist or even remotely operate the ship, in case of unintended and unforeseen events. Reliable communication links and a robust communication architecture ensure that the onshore and offshore components are appropriately connected. Unmanned vessels also need a special communication link when berthing crews are boarding and disembarking.

The captain would sit at a shore location, receiving real-time data from sensors over a secure communications link. With multiple cameras around the vessel, a full picture is available, including a bird's-eye view of the vessel in relation to its surroundings hence use complex mathematical models to provide the virtual world of a ship at sea and its response to control inputs, The computers would also be constantly analyzing operations data to improve efficiency and save money, he said. Cameras and sensors can already detect obstacles in the water better than the human eye.

One such bold step is taken by Rolls-Royce, who recently unveiled the design of the world's first remote-controlled unmanned cargo ship.

The concept of unmanned cargo ships revolves around a no-crew ship that can be controlled from the shore. A research project called **MUNIN** – Maritime Unmanned Navigation through Intelligence in Networks supported by the European Commissions, aims at developing and testing this autonomous ship concept.

BENEFITS OF UN MANNED SHIPS

Reduction of collision due to human error

Manning cost reduced drastically

No crew and allied facilities for them no super structure hence more dead weight i:e reduction of lightship weight by 5%.

Complicated services systems much simplified

Optimizing of the new hull will reduce fuel consumption 12- 15%.

Estimate of 20 percent reduction in emissions, as well.

Unmanned ships would also reduce risks such as piracy, since there would be no hostages to capture,

DETRIMENT OF UN MANNED SHIPS

Seafarers around the world can face unemployment issues

Legal issues related to seafarers rights

Advanced communication and navigation technologies to support remove control ships

Certification of seafarers for managing ships from shore

Setting up efficient shore control system

Urgent maintenance issues and detection of deteriorating conditions may arise onboard.

It would require a complete overhaul of the regulatory regime i:e - implementation of unmanned ship is illegal according to the minimum crew requirements regulation

Ships would become vulnerable to a different kind of hijacking: from computer hackers

Remote controlled vessels will lack the skills, knowledge and experience which professional seafarers provide I:e Taking quick decisions of navigating the ship in rough weathers though waves with head on condition.

The U.S. Defense Department's Tactical Technology Office (TTO) is developing the Anti-submarine warfare Continuous Trail Unmanned Vessel (ACTUV). The goal may be military, but the advantages are much the same i:e maritime disasters are totally eliminated by automated technology.

It will take some time, and there will, of course, be some pushback. The organization's (ICS) director of external relations, Simon Bennett, believes we will have a long wait before unmanned ships pass the concept stage. "We're looking at around 20 to 30 years before we can realistically expect ships to be sailing without crew

There is the hurdle of current international legislation, which strictly regulates minimum crew numbers. Politically, reducing crew numbers is still controversial, and there can be a tendency for humans to overrely on technology. If technology fails, then we need to rely on our age-old seafaring skills."

According to the International Maritime Bureau Piracy Reporting Centre, from January to May 2014, there were 72 reported piracy incidents globally. It's easy to imagine this number climbing with a proliferation of unmanned ships. "There would be no human hostage situation from piracy, however, pirates might see the ships as easy targets. Having no crew or guard to watch for and evade pirates would make piracy easier.

The stepping stone for this Unmanned ships concept is the use of UMS (UNMANNED MACHINERY SPACES) ships that are being used in the coming years to come we will have complete ships unmanned and controlled from shore. The number of UMS ships has increased rapidly over the past few years. The circuit and sensors for this function must be additional to the alarm circuit are provided that provides control of engine room from the bridge. On the bridge, both audible and visual alarms are to operate and indication given when the speed of the main engines is to be reduced due to the following fault condition: high scavenge air temperature, oil mist detected in crankcase, low piston coolant outlet flow, low piston coolant pressure, also for low cylinder coolant pressure if on a separate circuit etc.

In recent years **Unmanned surface vehicles** (USV) or **autonomous surface vehicles** (ASV) are more commonly found in the use oceanography as they are more capable than moored or drifting weather buoys, but far cheaper than the equivalent weather ships and research vessels and more flexible than commercial-ship contributions. Wave gliders, in particular, harness wave energy for primary propulsion and, with solar cells to power their electronics, have months of marine persistence for both academic and naval applications. Military applications for USVs include powered seaborne targets the recent examples are the **Fleet class USV** is an Unmanned Surface Vessel designed for the United States Navy to be deployed from Freedom and Independence-class littoral combat ships and intended to conduct mine and anti-submarine warfare missions.

INS KAMORTA

The first indigenously built stealth anti-submarine warfare corvette — INS Kamorta, a frontline warship with an array of anti-submarine warfare, anti-air and anti-surface weapons and sensors, is the first of four ASW stealth corvettes designed by Indian Navy's in-house organisation, Directorate of Naval Design (DND) and build by Garden Reach Shipbuilders and Engineers Ltd., Kolkata. The vessel is the first indigenous anti-submarine corvette as well as the first indigenous stealth corvette built by India. The stealth features incorporate the 'X' form of the hull and full beam superstructure and inclined ship-sides for low RADAR cross section, while the use of infrared signature suppression (IRSS) makes her less vulnerable to detection. The vessel has been named after the Kamorta Island in Nicobar Island, India.

The order for the construction of four indigenous corvettes under Project 28 was placed by Indian Navy in 2003. The keel for the lead corvette in class, INS Kamorta, was laid down in November 2006. It was launched in April 2010 and commissioned into the Indian Navy on 23 August 2014 by Defence Minister ***Shri Arun Jaitley*** at Naval Dockyard, Visakhapatnam.

Design features

The Kamorta features indigenously developed special grade high tensile steel hull incorporating a superstructure made of indigenous DMR 249A steel and Carbon Fibre Reinforced Plastic (CFRP) materials. The hull and superstructure are designed to achieve low radar cross section.

The stealthier hull form is designed to deliver excellent sea keeping and maneuverability characteristics while also ensuring lower noise and vibration levels. The ASW corvette includes indigenous content of about 90%.

The corvette has an overall length of 109.1m and beam of 12.8m. The standard displacement of the vessel is 3,500t.

Naval gun systems

The OTO Melara 76mm Super Rapid Gun Mount (SRGM) on the bow deck can deliver a rate of fire of 120 rounds per minute. The gun can fire standard ammunition for a maximum range of 16km.

Two AK 630 CIWs (Close-In Weapon Systems), each mounted on either side of the deck, provide close-point defence against anti-ship missiles, precision guided weapons, low flying fixed or rotary wing aircraft and small craft.

Missiles, ASW rockets and torpedoes

The Kamorta Class is installed with a 16-cell vertical launching system (VLS) for firing Barak Surface-to-Air Missiles (SAMs). The Barak SAM system can strike anti-ship missiles, fixed and rotary-wing aircraft as well as UAVs.

The RBU-6000 (IRL) anti-submarine rocket launchers and triple torpedo tubes mounted on the vessels ensure the engagement of enemy submarines.

Sensors and countermeasures

The Kamorta Class integrates Revati 3D surveillance radar, fire control radars and HUMSA (Hull Mounted Sonar Advanced).

The countermeasures against various incoming missiles are provided by Kavach naval decoy system. The Electronic Warfare System (EWS) fitted on the vessel further enhances the survivability.

Helicopter landing facilities

The stern landing deck can support the operation of a single helicopter. The Kamorta Class corvettes are the first Indian Navy ships to be equipped with rail-less helo traversing system and foldable hangar door.

Propulsion

The Kamorta Class is powered by a combined diesel and diesel (CODAD) propulsion system integrating four 3,800kW main diesel engines, two controllable pitch propellers and noise-suppressing raft-mounted gearbox.

The shipboard power is provided by four diesel generators supplied by Wartsila. The Kirloskar Engines, the licensee of SEMT PIELSTICK of France, delivers the engines, while raft-mounted gearboxes are supplied by DCNS.

The propulsion system provides a maximum speed of 25knots and range of about 3,450nmi at 18knots speed.

The ship is manned by a crew comprising 13 officers and 173 sailors with Commander Manoj Jha as her first Commanding Officer. The vessel is now an integral part of the Eastern Fleet under the Eastern Naval Command.

India’s first Indigenous (civilian) Research Vessel RV Sindhu Sadhana

This era could be said as a Golden era for Indian Maritime sector in the field of research and development as it has reached a new milestone of building highly sophisticated vessels indigenously. It is a proud moments for Every Indian as India has acquired the technologies to manufacture machineries and build an entire ship by its own. On one face where INS Vikrant is the new brand for military ships and on the other face RV Sindhu Sadhana stood as the new brand for Research vessels

India acquired many research vessels in the past but **RV Sindhu Sahdana** will remain as a brand in this field as it is the first ever indigenous civilian research built with ten state of the art equipped laboratories and accommodating 57 personnel. This Magnificent ship is owned by Council of Scientific and Industrial Research-National Institute of Oceanography and it was built by ABG Shipyard in Gujarat.

What are research vessels?

Research vessel may be specially designed or converted vessels used for the studying various fields in nature. This kind of ships possesses equipment's for carrying out operations like survey, sample collection, observations and primary data collection. These are classified to many types as Oil exploration, Polar research, naval research, Fisheries research, Hydrographic survey and Oceanographic research. Oceanographic research vessels are built to carry out research on physical, chemical and biological characteristics of water, climate and the atmosphere. These vessels are mostly equipped with diving and ROV and AUV launching facilities.

Design requirements of research

The main aim of any research organization is to possess a ship with more sea keeping and maneuvering facilities to collect data and also process them mostly for primary observations. The research vessel should have sufficient area to accommodate researchers, crew as well as sophisticated research equipment's along with enough working area. She should have launching facility for launching AUV or ROVs as they play a major part in conducting survey or for sample collection. Most of the oceans going research vessels are also provided with Helipad.

History of research vessel

In the past the first ever recorded research vessel is James cook's Endeavour which was used to travel the Pacific Ocean to observe and record the transit of Venus across the Sun. Later on form the transformation of mechanical to digital age the research vessels were given much importance and the tremendous development in the machineries gave an wonderful opportunity to build a research vessels with many sophisticated instruments which helped to carry on hydrographic survey, Antarctic research, fishery research, oil exploration and many more things could be unknown to human kind without this ships.

About the ship RV Sindhu

The ship RV Sindhu Sadhana is 80m long and 17.6m wide giving it enough space for working area in highly sophisticated laboratories. She is also integrated with dynamic positioning system which plays a major role in maneuvering of the ship. The ship is designed for a cruising speed of 13.5 knots, 4m draft and with an endurance of 45 days which would give an enough opportunity to explore the ocean. She is equipped with many advanced research equipment's for online data collection and processing .RV Sindhu Sadhana has facilities for online data collection and processing from single-beam and multi-beam echo sounders, along with water column and sub-bottom profiler, gravimeter, magnetometer, Acoustic Doppler Current Profiler and conductivity-temperature-depth (CTD) profiler.

She also has autonomous weather station (AWS) facility, air quality monitors and sampling gears such as A-frame, Gamma frame, CTD winch and deep sea winches with supporting cranes. This facility makes this ship a complete floating portable weather station.

The dynamic positioning system along with the ships propellers plays a major role in maintaining a stable position while data collection and processing. This function comes to major role while launching the Remotely Operated Vehicles (ROV) or Autonomous Underwater Vehicles (AUV) .It also facilitates precise deployment of instrumented moorings.

This all features make the ship RV Sindhu Sadhana a perfect tool for the researchers to explore the great oceans and know the unknown wonders of the oceans

What makes this ship special?

Indigenous built research vessel
Dynamic positioning system
Autonomous weather station
Highly sophisticated laboratories

Reference: National Institute of Oceanography website: http://www.nio.org/

CAMPUS LIFE…… AT IMUV

- The semester started by ***Mr. Noboru Ueda*** the President and Chairman of Class NK visiting our campus and interacted with our students and faculty.

- As the semester started the new NASS team

General Secretory : ***Gaurav Jha***

Cultural Secretory: ***H.V. Uday Bhaskar***
Sports Secretory : Manish Kumar
Treasurer: ***Varun Soni***

With assistants ***Dinal Achary, Anantha, Aravind*** of second year taking charge of the new NASS team

- Janmashtmi was celebrated in college with full devotion with students enjoying the dahi handi competition.

- Fresher's joined in this semester with new talent from nationwide coming to our college. Introductory gathering *"Alaap"* with combination with celebrations of Teachers day was organized by the first years and NASS team.

- La Ola gets its new editor ***Tarun Tripathi*** and warmly welcomes its three new members ***Nripendra Neerav, Suraj Powar*** *and* ***Prateek Kudtarkar.***

- **NASS** name was changed to **Indian Maritime University Visakhapatnam Student Society (IMUVSS)**

OUR RECRUITERS

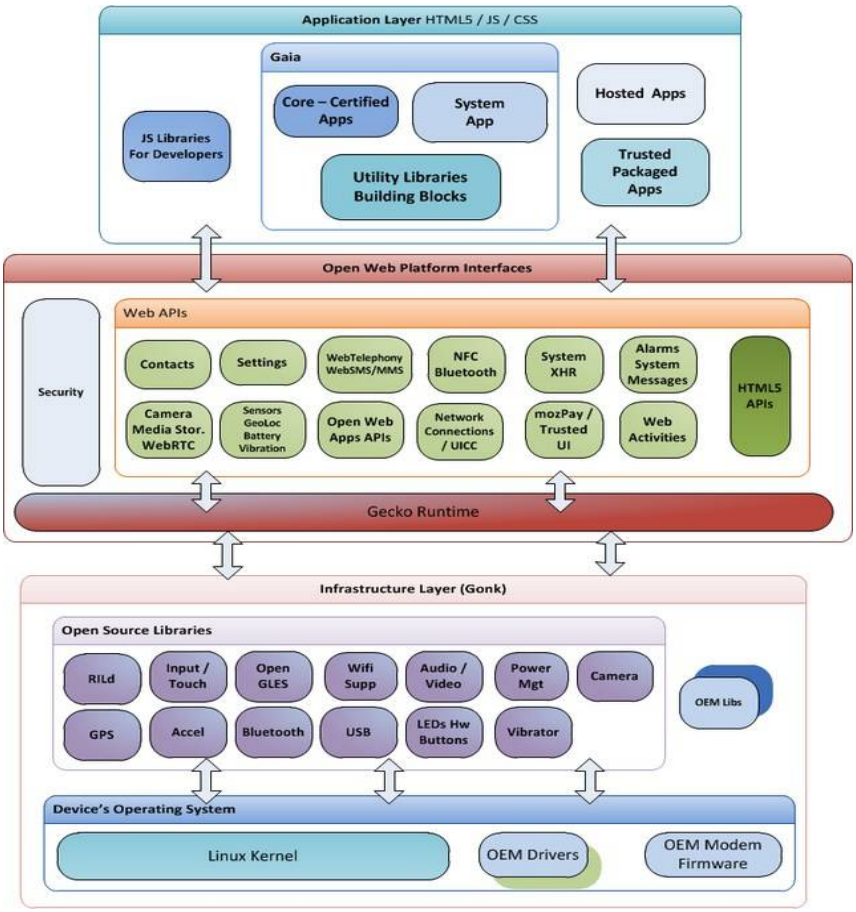
- CLASS NK
- INDIAN REGISTER OF SHIPPING
- INTERGRAPH CONSULTANCY
- MAZAGON DOCK LIMITED
- BHARTI SHIPYARD LIMITED
- VEDAM CONSULTANCY
- KEPPEL OFFSHORE & MARINE
- PIPAVAV SHIPYARD.
- ODENSE MARINE TECHNOLOGY
- DREDGING CORPORATION OF INDIA
- LARSEN &TOUBRO VALDEL

A NEW OS HITS THE MOBILE MARKET

Firefox OS is open source and therefore free from proprietary technology, while still providing the power to allow application developers to create excellent products. In addition, it's flexible and capable enough to make the end user happy.
For Web developers, the most important part to understand is that the entire user interface is a web app capable of displaying and launching other Web apps. Any modifications you make to the user interface and any applications you create to run on Firefox OS are web apps created using HTML, CSS, and JavaScript, albeit with enhanced access to the mobile device's hardware and services.

Firefox OS is a Linux kernel-based open-source operating system for smartphones and tablet computers and is set to be used on smart TVs. It is being developed by Mozilla, the non-profit organization best known for the Firefox web browser.

- Firefox OS is designed to provide a complete community based alternative system for mobile devices, using open standards and approaches such as HTML5 applications, JavaScript, a robust privilege model, open web APIs to communicate directly with cellphone hardware, and application marketplace. As such, it competes with commercially developed operating systems such as Apple's iOS,Google's Android, Microsoft's Windows Phone and Jolla's Sailfish OS as well as other community-based open source systems such as Ubuntu Touch.



Firefox OS was publicly demonstrated in February 2012, on Android-compatible smartphones, and again in 2013 running on Raspberry Pi. In January 2013, at CES 2013, ZTE confirmed they would be shipping a smartphone with Firefox OS, and on July 2, 2013, Telefónica launched the first commercial Firefox OS based phone, ZTE Open, in Spain which was quickly followed by GeeksPhone's Peak+.

Mozilla has also partnered with T2Mobile to make a Firefox OS reference phone dubbed "Flame" which is designed for developers to contribute to Firefox OS and to test apps.

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Marine Pollution

For many, the ocean is a dumping ground for anything and everything. Advocates believe the "solution to pollution is dilution."
SO WHAT'S THE PROBLEM?

Discarded fishing nets drift for years, ensnaring fish and mammals

Solid waste, such as plastic bags, are consumed by marine life, often with deadly consequences

Scientists have discovered the pharmaceuticals we ingest but don't fully process end up in the fish we **EAT**

Nonpoint Source Pollution

One of the biggest sources of marine pollutants is a result of runoff from such places as farms, septic tanks, and industrialized areas

Hypoxia Nitrogen-rich fertilizer runoff can cause massive algae blooms, robbing water of oxygen, leaving little to no viable areas for marine life

Common manmade pollutants to reach the ocean:

PESTICIDES HERBICIDES CHEMICAL FERTILIZERS DETERGENTS OIL SEWAGE PLASTICS

State the facts...

In the North Pacific, the garbage patch known as the **Pacific Trash Vortex** is estimates to be the size of Texas

Each summer a dead zone the size of New Jersey forms in the Mississippi River Delta

In 2010, a new massive garbage patch was identified in the Atlantic Ocean

Many pollutants collect at the oceans' depths where they are consumed by small marine organisms and then introduced to the global food chain

Degradation of shoreline areas have accelerated dramatically over the past 3 centuries with the increase of industrial discharge and runoff from farms and coastal cities

Noise Pollution

Sonar, oil rigs or even earthquakes can disturb migration, communication, and reproduction patterns of marine life, particularly mammals

By the numbers...

80 Percentage of marine pollution that comes from land

More than a **third** of shellfish growing in US waters are adversly affected by coastal pollution

Scientists have counted some **400 dead zones** around the world

A **1,000-mile-wide** swath of decomposing plastic is floating in the northern Pacific Ocean

1972 US Congress passed the Federal Water Pollution Control Act, better-known as the Clean Water Act

There are **40 MILLION** acres of lakes and reservoirs in the United States

Sources: oceanservice.noaa.gov/facts/pollution.html • water.epa.gov/aboutow/owow/programs.index.cfm • water.epa.gov/type/

Kendal Yookum, 2014

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