



TOUCH OF **CLASS**
ISSUE 02 | 2016

M/s Global Shipyard RMC FZC, U.A.E.,
built their first vessel M.V. Almarjan under
single class of IRClass.



Contents

Chairman's Message	Page 03
From the Editor's Desk	Page 04
The Solar Dream	Page 05
Up,Close & Personal	Page 09
Classing Yard Crafts for Indian Navy	Page 13
IR-Hull - A step towards digitalization	Page 14
IRClass on Social Media	Page 17
Employee corner	Page 19
Promotions	Page 21

Chairman's Message



Dear Reader,

I am happy to inform you that European Commission has granted recognition to IRClass in accordance with EC Regulation no- 391/2009 on Common Rules and Standards for Ship Inspection and Survey Organization. This moves IRClass closer to obtaining RO status from various countries in European Union.

This could not have been possible without the support of industry stakeholders and the commitment of IRClass employees. We expect to make rapid progress in Europe and we will keep you updated on the same.

As you may be aware that IRClass has undertaken a restructuring exercise to align our services in line with the demands of the industry. This is showing results, which can be seen by the increase in the tonnage under its class to 11.8 mgt from around 10 mgt a year ago.

Considering the present depressed market conditions this is significant. I would like to take this opportunity to thank all the stakeholders who have reposed their faith in IRClass services.

Shipping industry is going through its worst & longest downturn in recent history. Though we see and hear of some good news of new builds or of the shipping indices recovering, these has been few and far between. IRClass like all others in the industry hopes this crisis ends soon.

With best regards.

Arun Sharma
Executive Chairman

From the Editor's Desk

Editorial Board:

- Vijay Arora
- B V Nargundkar
- N. Girish
- H.V. Ramesh

Coordinated & Executed by:

- Santosh Patil
- Sharvani Mishra

Creative Partners:

- Soumitra Bhattacharya
Studio Firefly

IRClass believes in technology driven innovations leading towards a sustainable environment. Towards this end, IRClass is working with various stakeholders to promote and support such projects.

In this edition we cover the "SOLAR DREAM" project. IRClass is undertaking classification of a new building 75 person capacity solar powered ferry being built at Ms. NavAlt Solar & Electric Boats. The unique design of this GRP catamaran is such that it uses rooftop solar panels to generate energy, which is stored in batteries. This power is then used to drive the propellers.

This edition covers an interview with our former Chief Operating Officer, Mr. C. Sriramamurthy, who was with IRClass for more than 25 years and has been an integral part of its journey. He shares his valuable insights on the IRClass journey.

We trust you will find this edition interesting to read and wish you pleasant reading. As ever, we welcome your feedback.

Editorial board.

The Solar Dream

K Shammy

Acknowledgement - Mr. Sandith Thandassery (M/s NavAlt)

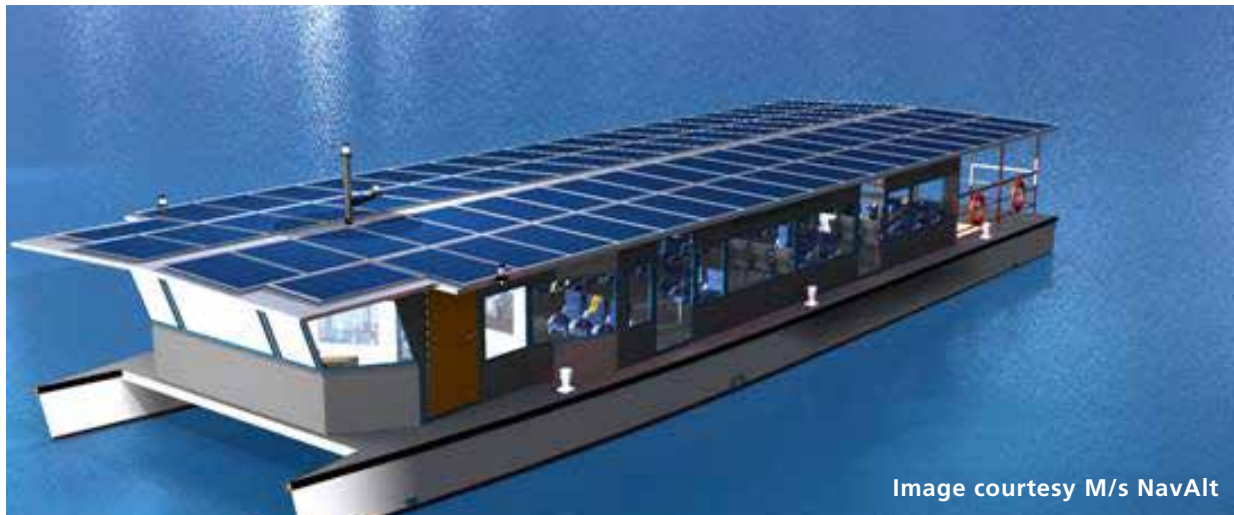


Image courtesy M/s NavAlt

Post the Earth Summit in 2012 at Rio, efforts have been underway all over the world to replace the use of fossil fuels, linked to climate change, with alternative sources of energy. The attempt is starting to bear fruit in Kochi, the economic capital of Kerala.

The State Water Transport Department (SWTD) of Kochi, Kerala, has placed an order for a 75 PAX solar powered ferry with M/s NavAlt Solar & Electric Boats, which is to be designed in technical collaboration with a French engineering firm Alten. The ferry will be classed with IRClass. The CEO of M/s. NavAlt Solar & Electric Boats, Mr. Sandith Thandassery, has shared several design, feasibility and economic aspects about the ferry.

Undoubtedly, Solar boats are significantly better than conventional boats because they:

- do not pollute water
- do not release harmful emissions in air

- are very silent and comfortable for passengers
- have low vibrations
- no smell of diesel or petrol
- have lower cost of ownership (high initial cost but relatively lower operating cost)

The process of solar boat design is different from that of a conventional boat. So much so that it can be termed as “solar boat design philosophy.” A successful solar boat requires two different but critical focus areas:

- Minimizing required propulsion power
- Optimization of Energy management

Reduction in Propulsion power

The first critical step is to drastically reduce the propulsion power compared to a conventional boat. This can be achieved in five ways.

1) Almost always an adopted practice for solar passenger boat is to make the boat as a multi-hull, usually catamaran, which ensures a lower resistance for the same displacement and speed. This also has higher stability compared to a single hull vessel. Designing a solar boat as a catamaran has an added benefit of having larger deck area for providing solar panels.

2) The propulsion power required by the boat can also be reduced by lowering the drag of the hull. This can be achieved by optimizing the hull form using the latest techniques like computational fluid dynamics (CFD). The hull shape has to be optimized for the operational condition (displacement, draft, trim, speed) so that the resistance of the boat is minimum. Fore-body and aft-body shape is optimized to get best results.

3) Another approach to minimizing the propulsion power is by reducing the weight of the boat. The greatest contributor to a boat weight is the hull. Solar boats are almost always built of composite (FRP, carbon fibre) or aluminum. The superstructure of the boat is also constructed of similar lightweight material. Every single item that goes into the boat is checked to meet two conditions:

i. Is it necessary; can it be avoided?

ii. Can it be lighter?

4) The propeller design itself is critical to ensure that power delivered to the propeller is converted to useful thrust. It usually leads to larger propeller diameter and optimum rotating speed (RPM), pitch and area ratio to give the highest efficient propeller, usually close to 55%.

5) Apart from the above mentioned major factors, the other minor aspects that affect propulsion power demand also need to be taken care i.e.

flow to propeller, clearances, shaft bearing, rudder design, etc.

Once all of the above are incorporated, the propulsion power needed for a solar passenger boat compared to a conventional boat becomes half as compared to the composite boat and less than one-third of that of a steel boat.

Optimization in Energy management

Motors have to withstand the rugged marine conditions and continuous usage. For larger systems of more than 6 kW load, the motors may be 3 phase AC motors (synchronous or asynchronous). A suitable controller would vary the speed/power input and thereby vary the speed of the boat. The shafting also contains a thrust bearing to protect the motor from direct axial load and transfer the propeller thrust efficiently to the hull.

Panel Size and Battery Bank

The other two critical components of a Solar propelled boat are the panel size and the battery bank, both of which are dictated by the total power requirement of the ship through a single day and the average intensity of sunlight in the region. This shall then need to be justified with the available area on the boat for installation of solar panels. Usually the effort is to maximize this area available since the cost of power from solar energy is cheaper than its alternative fuel.

A number of factors play up in calculation of average solar units of a location. The total energy available during the day from solar panel depends on the location and weather condition. Locations closer to equator receives more direct sun rays than those far away. Further, a bright sunny day generates more solar units than a cloudy day.

The panel charging time is usually calculated from 8 AM to 5 PM in summer, in places like Kerala which are closer to the equator. The rate of charging increases as the sun peaks at about 1-2 PM. The available energy from the

The process of Solar Boat design is different from that of a conventional boat, so much so that it can be termed as "Solar boat design philosophy"



sun varies with the months of year as well. For example, in Kerala the average for the month ranges from 4.68 in June to 6.83 standard sun in March. The average for the whole year is 5.72. For a cloudy day these might be close to one-third.

The panel size thus arrived should not only cater to the propulsion system, but also charge the battery bank for use up to 6 to 10 hours. Therefore, to arrive at a panel size, we can take "propulsion load + Battery Power". The depth of discharge allowed for a longer life of battery depends on the type of battery which will in turn drive the battery bank size. For example, lithium batteries can be discharged by 80% compared to 50% for lead-acid batteries. At this depth of discharge, lithium batteries have a life of 2500 cycles compared to 500 for lead acid batteries.

The system of battery, battery management system (BMS), motor controller and motors together are called as powertrain. Unlike cruise boat that runs for only 3 to 4 hours a day, ferries need to run for 6 to 10 hours a day. This means the powertrain installed needs to be of higher reliability, ruggedness and efficiency. Usually, therefore, lithium based batteries (iron magnesium phosphate being safer) are preferred for such systems. Additional safety features usually include independent auto-bilge pump in all compartments.

Economic Analysis

Almost always a common question that is asked is whether the solar boat is worth the expense? Well! The designers are highly affirmative about it. Large solar ferries are usually four times costlier than a conventional single hull steel ferry. However, if one raises the ergonomics and safety standards (built under classification society) of the conventional boat to that of solar ferries the ratio is close to 1.5.

The consumables cost (fuel and lubes) is usually INR 20-25 lakhs for a large conventional ferry compared to zero for solar ferries. Diesel engines and steel hull structure have higher maintenance

compared to electric motors and FRP hull. According to the designers, the total operating costs of a conventional ferry comes to about INR 25-30 lakhs per year. If one adds the carbon credit, government subsidy, and then do an economic analysis, the break-even period of a solar ferry is as low as two years.

The design has fetched NavAlt several accolades from the media as well as other agencies.

The details of the ferry being built at Kochi

The vessel is a GRP catamaran solar-powered passenger ferry with passenger capacity of 75 pax. Intended for operation in the Vaikom-Thavanakadavu route in Kerala.

Main Particulars:

Type: Catamaran

Length OA: 20.00 m

Breadth OA: 7.00 m (w/o fender)

Breadth (demi-hull): 1.50 m

Depth moulded: 1.60 m

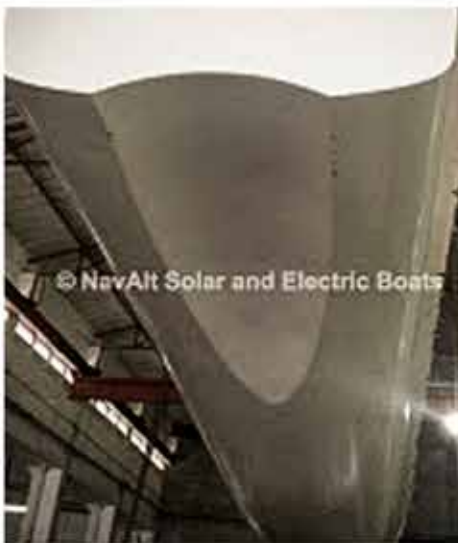
Draft: 0.80m

Trial speed: 5.5 knots in deep water

Prime Mover: 2 X 20 KW electric motors

Propulsion: 2 nos. Ni-Al-Bronze FPP

The electric propulsion motors to be powered by solar panels mounted on the coach roof and by the standby battery bank located in each demi hull.



Solar Ferry



Up, Close & Personal

With **Mr. C. Sriramamurthy**, Chief Operating Officer

Mr. C. Sriramamurthy, Chief Operating Officer of IRClass, is an inspiration to all in the maritime industry in general and IRClass in particular. He hails from a humble background and with his simplicity, modesty, warm smile and clear vision, he has successfully nurtured and transformed IRClass into an internationally well respected organization.

On the occasion of his superannuation, Mr. Sriramamurthy spoke to Touch of Class – our in-house magazine.

Touch of Class (TOC): Good Morning Mr. C. Sriramamurthy. Thank you for your time today.

You have been associated with IRClass for a long time and have been part of the growth story of the organization. Can you share with us when, how and why did you join IRClass?

Mr. C. Sriramamurthy (CS): I joined IRClass in March 1989. Prior to joining here, I started my career in Mogul line LTD and rose to the rank of Chief Engineer. In 1982, at the time of taking over vessel "MV Lok Maheshwari" as a chief engineer in Hindustan Shipyard, I met Mr Madhok, then Surveyor-in-Charge of Vizag Survey Station, for the first time. This initiated my interest in the works of Classification Society. As technical persons, we often come across instances where we needed advice from Class Surveyors. I was impressed by the knowledge and problem solving ability surveyors

had and so was motivated to join IRClass. I had many subsequent positive interactions with IRClass which then encouraged me to approach Mr. Madhok for a position in the organization. Fortunately for me, there was a vacancy and I was recruited as an Engineer Surveyor in March 1989.

TOC: How many years have you invested in IRClass and how was your career journey? Please tell us about your various postings?

CS: In March 1989, I joined IRClass Vizag and I was there for a long time; rising from Surveyor to Sr.Surveyor, then as Surveyor-In-Charge of Vizag Survey Station.

As the organization grew, I was given many new assignments and had executed all to the best of my abilities. I recall one of the toughest times was in year 2000 when the organization assigned me the responsibility to open an office in China, which was booming with new constructions and ship repairs. My only contacts in China were a handful of shipyard personnel in Qingdao and the management wanted a set up the office in Shanghai.

So I started inquiring with my known sources and one of them asked me "Why do you want to open an office in Shanghai where the cost of living is very high and with hardly any shipyards? Why don't you open an office in Qingdao where connectivity is much better?" .



Mr. C. Sriramamurthy
Chief Operating Officer



Now this prompted me to find out more about Qingdao – going through the past three years' analysis of shipyards, vessels coming for repairs etc. The percentage of ships seen in Shanghai were negligible compared with Qingdao. So I suggested to the Management that Qingdao will be much better choice for the time being over Shanghai, and this was readily accepted.

Things started moving very fast from that point, I had to move to China on very short notice leaving behind my family and a daughter studying in 11th standard [which is a critical stage in schooling period]. I was posted there for 3 years.

I returned to Vizag in year 2004 after successfully establishing IRClass office in Qingdao. In 2007, I took up the responsibility as Surveyor-In-Charge of Mumbai Survey Station and from 2008 as HOD Classification. Subsequently, I became the Divisional Head of Ships in Service department and then took over as Chief Operating Officer in September 2012.

TOC: Please tell us how your family has supported you in your journey with IRClass and how did all of you find your association with IRClass?

CS: My family has supported me throughout my journey in IRClass. When I took up the job at IRClass, I told my wife very clearly that the pay is much lower as compared to seafaring roles, since I'll be onshore. Also, during my tenure in China, she managed our home and children in spite of being alone for three years. There is no doubt that my family has provided unwavering support to me and has never complained in any manner.

TOC: Please tell us about the different stages of your career in IRClass and the challenges, you faced over the years?

C.S: Challenges are a part and parcel of professional life. Initially when I started my career, IRClass was

proposing owners to dual class existing ships, which prompted owners to ask questions like, "We already have one classification society; why should we dual class the vessels? ".

Few owners/operators were not too receptive and at times we were told to wait outside till the master finishes his work. But by and large, IRClass received enthusiastic response from all the stakeholders without which our growth would not have been possible.

During the time, I was in China, there were many technological advances taking place, which paved the way for the Electronic Era. With the assistance from the China Survey Station staff, we converted forms and checklists into digital online formats at that time.

Once, one of my Chinese colleagues asked as to, how I survived on vegetarian food, I used to give the example of elephants, which eat only grass but are much stronger animals. Personally, being a vegetarian and not knowing language, was a major challenge.

TOC: What is your message to the employees of IRClass? How should they lead their personal life and profession life? Please give them some tips !

C.S: Always remember that technology is changing the way we live, interact and work, Maritime sector is no different. We need to be open to adopt and drive new technologies and innovations. Both, at personal and professional levels, if we are not in sync, we will be left out. Further, always discharge your duties with integrity, identify and pursue your goals, this will take you to greater heights.

TOC: What according to you is the role of employees in ensuring the progress and success of the organization? What do you expect from them?

C.S: Employees are our greatest asset as it is through them that IRClass conveys its character and commitment to the world. And we are a team just like the organs in a human body. Each one of us needs to work towards the goals set out by the organization to achieve excellence in our services to the maritime community. We should continuously learn, evolve, upgrade and innovate to make IRClass "The Class by Choice".

TOC: How do you think IRClass has faired through these 40 years?

C.S: IRClass was formed in the year 1975 with a small office in SCI (Shipping Corporation of India) premises. To start with, we had taken a loan from shipowners through INSA (Indian National Shipowners Association) which we paid back within 2 – 3 years' time. We have sustained through rendering our services to the entire satisfaction of our customers, although we met with some skepticism.

We have faced many challenging phases in the last 40 years but have made steady progress . In the year 1991, we became an associate member of IACS and later in 2010 we got the full membership from IACS. [International Association of Classification Societies].

Today, our fleet stands at 11.3 million Gross Tons with more than 1600 vessels, of which about 80% are single classed.

We have 27 flag recognitions including Panama, Marshall Island, Liberia, Bahamas etc. and our port state control record is excellent for the last 5 years i.e. nil RO related detentions. We are looking forward to the E.U. recognition which is round the corner.

I wish that we will continue to progress in this fashion to reach greater heights.

We interact with all stakeholders including administrations, ship owners, designers, builders and operators on regular basis. Through these interactions, we have built their confidence in us.

TOC: Please share with the readers of Touch of Class the general wisdom and learning in life from your point of view.

C.S: Please have a balance in the work and social life .You must have satisfaction in what you are doing. As long as you are doing your work diligently, you will be able to overcome any hurdles that come along your way.

TOC: Thank you Sir, for your time and on behalf of our team of TOC, we wish you success in all your future Endeavour.

C.S: Thank you.

Classing Yard Crafts for Indian Navy

Cdr. K Dhawan



Those of us who have had a stint with Indian Navy are aware of the special Rules that apply to building and maintaining Naval Ships. For those holding portfolios purely in merchant shipping know that the international statutes do not apply to the vessels owned by Navies across the world. IRClass, in the recent past, was involved in classification of non-combatant vessels, including yard crafts (e.g. such as tugs, ferries, fuel and water barges etc.), ensuring compliance with the published Rules & Regulations. Subsequently, these vessels do not maintain class.

Since, there is a considerable increase in the workload on naval maintenance facilities, due to increase in the fleet size, Indian Navy has now decided to maintain class of their yard crafts with IRClass. This will subject the vessel to periodic surveys and any repair/maintenance work can be identified at an early stage.

The first ever yard craft to have received our 'Certificate of Class' is vessel "Neelam" posted out of Kochi Naval Base. The certificate was handed over by then Chairman and Managing Director (now Executive Chairman) of Indian Register of Shipping, Mr Arun Sharma on 05 April 2016, at Kochi, to Vice Admiral Girish Luthra, AVSM VSM, the then Flag Officer Commanding-in-Chief Southern Naval Command (presently Flag Officer Commanding-in-Chief Western Naval Command).

There are about 60-70 yard crafts posted at the 5 key Command Head Quarters of Indian Navy, namely, Visakhapatnam, Kochi, Mumbai, Karwar and Port Blair. IRClass is committed to be associated with Indian Navy in this endeavour and hopes to further the relationship in future.

IR-Hull

- A step towards digitalization

Rahul Bhat, Kapil Kumar Zaveri, Naveen V R, Utkarsh Raut and Dr. Asokendu Samanta

Introduction

IR-Hull Rule Scantling Calculation Software assists users to verify the compliance of ship designs with the Rules and Regulations for Construction and Classification of Steel Ships set forth by Indian Register of Shipping (IRClass). This software has been developed indigenously by the Technical Software Development and Management (TSDM) team of Indian Register of Shipping.

Need for a Rule Scantling Calculation Software

Verification of compliance of scantlings with Class Rules is a fundamental part of Ship design process. Scantling compliance checks are iterative processes which also aid in optimizing design requirements of the ship. Digitalization of scantling rule verification process will help to expedite the complex and repetitive calculations involved in the traditional methods followed by users.

IRClass has taken a step forward to ease out application of rules for customers by releasing IR-HULL software to the stakeholders of marine and ship building industry.

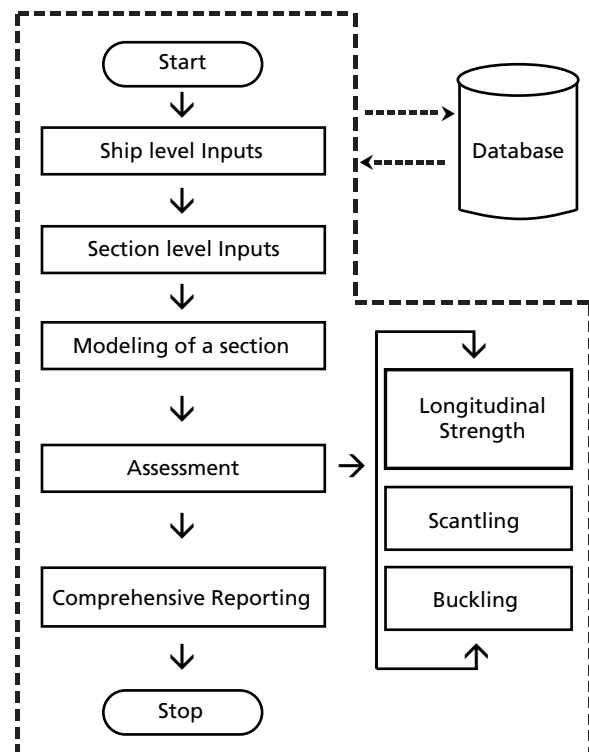


Figure 1 Flowchart representation of framework

Framework of IR-HULL Software

Key Features

• Intuitive modeler

IR-Hull has an intuitive modeler with smart CAD features. Following are the steps involved in the modeling of a ship section.

IRHULL will enable users to digitalize the compliance checks of ship designs against IRClass Rules



IRClass on Social Media

We are active on LinkedIn and Twitter!



As many of you already know, IRClass is currently active on two global social media networks: LinkedIn and Twitter.

Building awareness of IRClass in the international markets via social media is one of our core focus points moving ahead, and we are pleased with the start we have made.

We currently have 2600+ followers on LinkedIn who actively participate and like, comment and share our updates to their network. On Twitter, our handle is @irclass. We currently have 100+ followers. This number is also growing, and you can help that:

We request all our team members, customers, associates to follow us and regularly visit IRClass on LinkedIn and Twitter to stay abreast with the latest news, updates and events at IRClass. Please feel free to share, like, tweet and comment on our posts.

We actively encourage good, responsible use of social media by all to promote and enhance the growing reputation of IRClass.

If you have any queries regarding IRClass' social media presence please drop in a line to us on bizdev@irclass.org

LinkedIn

Indian Register of Shipping IRClass establishes presence in Hong Kong to serve East Asia Pacific region



IRClass establishes Hong Kong presence to serve expanding East Asian markets better

irclass.org Indian Register of Shipping (IRClass), announces the setting up of a new regional office in Hong Kong to serve the dynamic East Asia region.

Indian Register of Shipping IRClass receives recognition from European Union



IRClass receives recognition from European Union

irclass.org On 1st August, 2016, the European Commission adopted a decision granting recognition to the Indian Register of Shipping (IRS) in accordance with Regulation (EC) No. 391/2009 of the European Parliament.

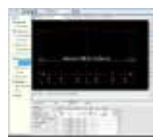
Indian Register of Shipping IRClass strengthens its senior management structure



IRClass strengthens its Senior Management structure

irclass.org In a move to strengthen its senior management structure, The Indian Register of Shipping (IRClass) ...

Indian Register of Shipping IRClass releases IR-Hull Software



IRClass releases IR-HULL software
irclass.org IRClass, the Indian classification society, today announced the release of its new technical software, IR-HULL. IR-HULL was developed by IRClass specifically to verify all ..



Whats' Happening



IRCLASS @irclass Sep 6

#IRClass establishes presence in Hong Kong to serve East Asia Pacific Region <http://bit.ly/2cbPH9N>



IRCLASS Retweeted



IHS Maritime & Trade @IHS4Maritime Aug 11
#India's IRClass set to broaden coverage with #EU recognition
<http://bit.ly/2aYg3sC> #maritime #shipping



IRCLASS@irclass Sep 28

Indian Register of Shipping launches #IRClass Maritime Mobile Application and revamped website #WorldMaritimeDay @IMOHQ @shipmin_india



Home IRCLASS



Employee corner

Silent Heroes of IRCLASS



Mr C. Sriramamurthy

Mr C. Sriramamurthy has retired as Chief Operating Officer of Indian Register of Shipping on 30th June 2016, after 26 years of excelling service.

His journey with Indian Register of Shipping began in 1989 as a Surveyor. Ever since, has been Country Manager and Surveyor-in-Charge for various Indian and overseas branches. During his 3 years tenure as COO, IRClass became RO for Bahamas, Marshall Islands, Liberia and Malaysia flags, and added 1 Million Gross Tonnage to its portfolio with plans to increase substantially in coming years.

He introduced digitization like Online-Reporting-Systems, e-plan and digital archives, established Mid-East, Indian Subcontinent and South East Asia advisory committees, opened 3 key offices with plans to add 6 to 7 more in near future. He has turned IRClass from service provider to a solution provider. We shall remain ever grateful for his untiring efforts, guidance and direction to this organization.



Mr. Shantaram Gurav

Mr. Shantaram Gurav, Sr. Office Assistant from our Mumbai Survey Station has superannuated on the 30th of April 2016 after completing his dedicated service of 35 yrs with IRClass. 35 years of dedication and commitment from his end towards us is greatly appreciated and cannot be expressed in words.

Mr. Shantaram joined IRClass in the year 1981. He has been very sincere and honest in his field right from the very beginning where he showed patience and confidence all throughout. He was extremely proficient in assisting the seniors and managing the day to day activities of Mumbai Survey Station.

Mr. D. Rajeshwaran, Officer from our Chennai Survey Station superannuated on 31st May 2016 after completing his dedicated service with IRClass.

Mr. D. Rajeshwaran joined IRClass in the year 1982. He has been an efficient and organized professional with extensive experience in accounting systems. His enthusiasm to put in extra time and effort to help us meet deadlines has demonstrated a commitment to excellence that we have come to depend on.

Mr. Rajeshwaran has contributed 34 years of experience to our company, and his achievements will not be forgotten.

Wishing him the very best in the next steps of his journey.



Mr. D. Rajeshwaran

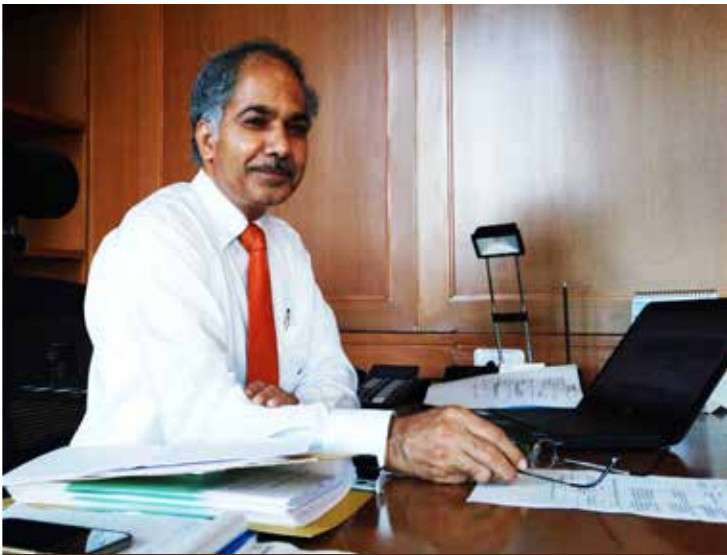
After 39 years of dedicated service to IRClass, Mr. Waman Kadam, Sr. Office Assistant, Mumbai Survey Station will be superannuating on the 30th of June 2016.

Mr. Waman began his career in 1977 in IRClass. He has always been responsible in providing clerical and administrative support to Mumbai Survey Station in an effective and efficient manner. His hard work, commitment and dedication are worthy of admiration. Mr. Waman's contributions will always be valued and remembered.

We wish him the very best in his future endeavour.



Mr. Waman Kadam



Mr K Bharadwaj has taken over charge as Head Operations.



Mr CR Venugopal is promoted to Chief Surveyor and has taken over charge as Head Technical.



Mr S Ranganathan has taken up charge Divisional Head of Plan Approval Centre.



Mr Tapan Kumar Sahu is promoted to Senior Principal Surveyor and has taken over charge as Divisional Head of Ships & Technical Services Division.

Promotions



Mr Bai Guo Ping has been promoted to Principal Surveyor. He is based in China.



Mr Luo Bing Huang is promoted to Principal Surveyor. He is based in China.



Mr Sangameswaram C.S. is promoted to Principal Surveyor and is now designated as Head of Colombo Survey Station

Mr Shashinath Mishra has been promoted to Associate Vice President, and continues to head the Management System Certification Division of IRClass Systems and Solutions Pvt. Ltd.



Mr. Vinay Kshirsagar, Chief Financial Officer, IRClass, receiving award for top 100 CFOs, 2016, at the CIMA Awards.



IACS 6th Safety Panel Meeting (August 2016) held at IRClass Head Office in Mumbai. Names from left to right, clockwise.

Ms. Jessie D'Souza (IRClass), Mr. Vijay Arora (IRClass), Mr. Amit Raghavan (IRClass), Mr. Wojciech Kozyro (PRS), Mr. Alf Roger Skevig (DNV GL), Mr. T. K. Sahu (IRClass), Mr. Yosuke Takao (ClassNK), Mr. Sebastien Crouzet (BV), Mr. Davide Campora (RINA), Mr. Gregory Shark (ABS), Ms. Rhoda Willson (LRS), Mr. Paul Sadler (IACS Accredited Representative to IMO), Mr. Jungkun Lee (KRS), Mr. Vladimir Vikulin (RS), Mr. Zhang Gaofeng (CCS).





BPCL BEST INSPECTION AGENCY 2015



IRCLASS
Indian Register of Shipping

52 A, Adi Shankaracharya Marg, Opp. Powai Lake, Powai, Mumbai-400 072

Phone: 91-22-3051 9400, Fax: 91-22-2570 3611, E-mail: ho@irclass.org, Website: www.irclass.org