



IRCLASS
Indian Register of Shipping

August 2024

TOUCH OF CLASS

Golden Jubilee Edition - Volume 1





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Message From The Executive Chairman's Desk



Dear Readers

As Indian Register of Shipping (IRS) enters its Golden Jubilee year, I pay my respects to the founders and architects of a glorious legacy achieved by overcoming many challenges. On this momentous occasion, while we celebrate their contribution, it's imperative to focus on what lies ahead, as the coming years pose challenges that promise opportunities, which will redefine shipping.

The maritime industry has committed itself to strong ambition of net-zero GHG emissions by 2050 with intermediate checkpoints. IRS being one of the key stakeholders, is committed to sustainability, while recognising its responsibility to the planet and future generations. Today, we stand at the cusp of a transformative era in the shipping industry stemming from the industry's commitment to achieve climate goals. The shift from sail to steam around 1860-1890 and then to diesel engines in early 20th century, revolutionised the shipping industry, making it faster, more reliable, and economically efficient. The next generation of ships will be driven not just by economies of scale but with an added impact of their environmental footprint. The 2030s will be marked as the decade of the upscaling of innovations driven by the need for efficiency, sustainability, and safety in global maritime transport. Advancements in green shipping technologies, digitalisation, autonomous ships, AI applications, cybersecurity and real time environment monitoring have the potential to reshape the shipping industry. However, adapting to the transition till we achieve a sustainable solution will be challenging.

As technology continues to evolve, so too will the methods and tools used to train seafarers, ensuring they remain well-prepared for the challenges of modern maritime operations. By focusing on "mentoring the mentor" programmes, organizations can build a strong foundation.

I would like to thank all our stakeholders who have been a part of this incredible journey of IRS and invite you to be a part of the various initiatives being planned for IRS Golden Jubilee. As we look ahead, our vision must stretch beyond the horizon, fuelled by the lessons of the past and the aspirations of the future.

I wish the readers a pleasant reading...!!!

Managing Director's Message



Dear Readers

As we celebrate the 50th year of Indian Register of Shipping (IRS), I am filled with pride and gratitude for our journey and achievements. Over the past five decades, IRS has evolved into a globally recognised entity, known for its technical expertise and rigorous standards.

Our progress is a testament to the dedication of the exceptional team at IRS. I appreciate the hard work, passion, and commitment, which have been instrumental in building IRS into a respected institution. As we move forward, this continued dedication will drive us to even greater heights.

Our growth has been fuelled by a commitment to innovation and a deep understanding of the maritime industry's needs. Recent initiatives in digitalisation and artificial intelligence exemplify our forward-thinking approach. By leveraging cutting-edge technology, we enhance efficiency, safety, and sustainability in maritime operations, setting new industry benchmarks.

I also want to extend my heartfelt thanks to our stakeholders for their unwavering support and trust over the years. Your partnership has been crucial to our success and growth.

Looking ahead, we will invest in research and development, strengthen capabilities in emerging areas such as green technologies, and expand our global footprint. These initiatives will reinforce our position and ensure we remain at the forefront of the maritime industry's evolution.

Thank you for your unwavering support and dedication. Here's to the next 50 years of excellence!



From The Editorial Board

Dear Readers

It gives us great pleasure to present to you this special edition of Touch of Class. As Indian Register of Shipping (IRS) approaches a glorious milestone of Golden Jubilee in April 2025, we will be releasing a series of 3 special editions of Touch of Class starting with this one.

50 years ago, IRS was born out of a need for a national classification society. With this foresight, strong leadership and dedication of all employees, this organisation has grown into a beacon of excellence and service to the Indian maritime sector. Today, as we reflect on our journey, we are filled with pride on the accolades we received, the challenges we have overcome, and the lives we have touched. Over the past five decades, we have adapted to change and evolved to meet the needs of our stakeholders, retaining integrity and quality service at our core.

Keeping with tradition, we have endeavoured to include a diverse range of technical and topical articles in this edition; and to celebrate our golden jubilee, we have testimonials to our dedication and collaborative spirit from our stakeholders in the maritime industry. An interview with our beloved former Chairman, Capt. J. C. Anand covers many interesting experiences and anecdotes. Mr. Chitnis who superannuated as a Chief Surveyor fondly reminisces about his time at IRS. We intend to include more memories from other members of IRS family in subsequent editions.

A brief walk down the memory lane is presented, reflecting on the journey and the dedication shown by all IRSians together with a history of IRS Rule Development, covering the period of pre-IACS membership i.e. years 1975 to 1991. We will be publishing these articles in 3 parts, spread out over the special Golden Jubilee editions.

We are immensely grateful and appreciative of NIOT, Hindustan Shipyard, Kanagawa Dockyard, Sanmar Shipping and Seven Islands Shipping for their articles. In celebrating this remarkable journey, we believe it is essential to reflect on the collective wisdom that has shaped IRS over decades. We welcome articles from other stakeholders to feature in our subsequent editions as part of this series. Your insights, experiences, and perspectives are invaluable in this regard.

As we commemorate this milestone, we look forward with renewed vigour and determination. The next fifty years hold endless possibilities, and we stand ready to embrace them with the same spirit of commitment and dedicated service. Looking forward to many more milestones that lie ahead.

Cheers!

- Editorial Team

Setting Sail: The Beginning & Early Years of IRS



Indian maritime history, spanning thousands of years, is rich in its innovative spirit and is regarded as a central aspect of our country's development and progress. The discovery of one of the earliest known docks built around 2500 BC in Lothal, a prominent city of the ancient Indus Valley civilisation has provided an abundance of archaeological evidence of the ingenuity, oceanographic knowledge and engineering prowess of our ancestors.

The Sanskrit text "*Yuktikalpataru*", estimated by some to have been written around 11 century A.D. deals with the subject of ship-building in two elaborate chapters with topics such as; (a) varieties of woods suited for construction, (b) classification of ships - river-going or ordinary (*samanya*) and sea-going or special (*visesa*), (c) two types of special (*visesa*) ships - *dirgha* (according to length) and *unnata* (according to height) (d) painting of ships, (e) ships with cabins and others. Not unlike our modern standards and rules! This expertise ensured that our dominance in the shipping industry lasted for centuries. One can find numerous literary references in history about prosperous trading between India and the eastern and western worlds.

The advent of Industrial Revolution (1760 to 1825) saw improvements in seaworthiness, credited to the increased use of iron reinforcement, better manufacturing processes and the replacement of the stepped deck seen in traditional European ships with a stronger flushed decked design, said to have been inspired by the hull pattern of Bengal rice ships. Steam power and the rise of diesel-powered engines in the second half of the 20th century transformed propulsion in sea transportation.

During the colonial era and the period that followed, Indian maritime sector relied heavily on certification bodies, which often could not fully cater to the unique requirements of the local shipowners and operators.



In the year 1967, Sir Ramaswami Mudaliar attended a meeting in Cairo, on Afro-Asian Cooperation in Shipping. On his return, he appraised the Government about the developments in maritime sector and the importance of setting up a National Classification Society. A meeting was convened in Delhi on 29th May 1967 by the Ministry of Shipping and Transport and under the chairmanship of K. C. Madappa, Joint Secretary, it was recommended to constitute a Steering Committee to advise on the issue.

The steering committee which was constituted on 20th June 1967, including representatives from different sectors of the shipping industry recommended the formation of a Classification Society.

It was decided that the National Classification Society, to be called Indian Register of Shipping (IRS), would be a non-profit organisation, with no share capital, no shareholders and distributing no dividends, collectively managed by those whose interests it serves.



1975 – Incorporation certificate of IRS

Members of the Promoters' Committee

Mr. M.G. Pimputkar
Chairman
Secretary, Ministry of Shipping and Transport and Secretary Planning commission (upto Nov 1974)

Capt. J. C. Anand
Vice Chairman
Chief Executive, Steamships and Chairman, INSA

Mr. M. Ramakrishnaya
Member
Secretary, Ministry of shipping and Transport

Mr. K. N. G. Menon
Member
Executive Director, Shipping Corporation of India

Mr. S.V. Bhawe
Member
Director General of Shipping

Mr. S.K. Desai
Member
- MD, General Insurance Corporation of India

Mr. A. Rajgopalan
Member
Chairman, General Insurance Corporation of India

Mr. T.M. Gokulda
Member
Chief Executive, Scindia Steam Nav. Co.

Capt P.S. Vanchiswar
Member
Nautical advisor to Govt. of India

Capt. R.D. Kohli
Member
Executive Director, Shipping Corporation of India

Mr. K.K Banerjee
Member
Chief Designer (Projects), Hindustan Shipyard Ltd.

Mr. D.C. Ahir
Member
Under Secretary to the Govt. of India, Ministry of Shipping and Transport

Mr. D.N. Phull
Secretary



1975, 4th April - Inauguration of Indian Register of Shipping (IRS)

Excerpts from the inaugural speech by Shri H. M. Trivedi, the then Union Minister of State for Shipping and Transport "It (IRS) is expected to provide assistance to indigenous manufacture of marine components and equipments and to result in greater utilization of indigenous talent. The IRS is also expected to contribute towards research and development in the shipping industry and serve as consultative organization for the general benefit of ship-owners, shipbuilders, insurers etc."

"I have great pleasure in inaugurating Indian Register of Shipping (IRS) – another milestone in the march of Indian Shipping towards self-reliance. I wish the Society a fruitful and prosperous future."

In the late 1970s and early 80s, IRS embarked on its journey to establish itself and garner a reputation as a technical and scientific research organisation.

The organisation was steered by the Board of Directors, Chairman and Chief Executive. The Technical Committee, the Classification Sub-Committee and the Research Sub-Committee were established to cater to different aspects of the working of IRS.



1975 - Indian Prosperity & Indian Progress, amongst First Ships Classed with IRS



1976 - DCI, Dredge V, First Ship Single Classed with IRS



1975 - Dual Class Agreements



1983-84 - Dual Class Agreements

Through the extensive efforts of the technical committee, IRS published its first rules in 1977. The Character of Class (𑂔) and notations were quintessentially Indian and celebrated our heritage. In subsequent years, the rules were revised, restructured and reformed to incorporate many subjects of design, construction and classification of ships and to accommodate IRS' growing domain.



Entry into Offshore





By the mid-80s, largely due to the support of the Indian Government and the industry stalwarts at home, IRS was making great strides domestically. However, the quest for recognition on an international platform was an uphill battle that involved overcoming scepticism over technical expertise and quality, doubt of its potential and navigating a seascape already dominated by mammoths.

1980 – Commencement of Industrial Services

In the coming editions: Navigating the Challenges, Growth and Sailing into the future

First Three Chief Executives of IRS



Mr. H. S. Rao
(1975-1980)



Mr. S. R. Khare
(1981-1990)



Mr. H. K. Taneja
(1990-1994)

Our Chairman at the helm



Mr. M Ramakrishnaiyya
(1975-1977)



Capt. J. C. Anand
(1978-1986)



Mr. K. M. Sheth
(1986-1990)



Mr. Ashok Goenka
(1990-1991)



Dr C. P. Srivastava
(1991-1994)



Capt. P. P. Radhakrishnan
(1995)



Capt. J. C. Anand
(1996-2012)



Mr. Arun Sharma
(2012-Present)

Rule Development History: Part I - Formative Years: 1975-1991

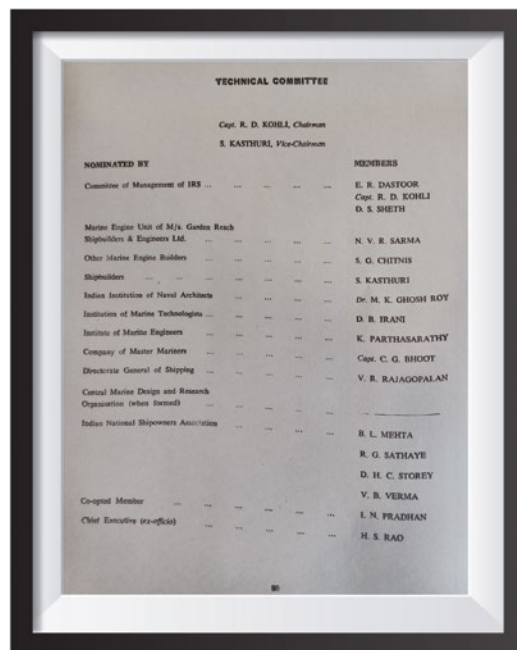
(Pre-IACS period: from inception to becoming Associate Member of IACS)

After IRS was established in 1975, efforts were made earnestly to meet the fundamental requirement of having its own Rules as a Classification society. At that stage, the main need was to publish at least the general Rules for Classification and Periodical Surveys initially to have a basis for taking into class existing ships and to carry out surveys.

The few experienced Surveyors who joined IRS at the time of inception put in their efforts to develop an initial draft of the Rules for Construction and Classification of Ships which was discussed in the first meeting of IRS Technical Committee. This meeting was held on the 4th of August 1976 chaired by Capt. R. D. Kohli of Shipping Corporation of India who was elected Chairman of IRS Technical Committee. The meeting was attended by about 10 members representing various stakeholders including Shipping, Shipbuilding, Regulators and Professional Institutions. This meeting was held in the Board room of Shipping Corporation of India.

The draft Rules were further detailed and discussed at the 2nd meeting of Technical Committee. Noting the urgent need of IRS to have its own Rules, the 2nd meeting was held in three sessions from 10th to 14th September 1976 with the cooperation of the Chairman and Members of the Committee. After the approval by the Committee, the first set of Rules of IRS were published in 1977 titled "Rules and Regulations for the Construction and Classification of Steel Ships".

These Rules consisted of chapters on General Classification regulations, Character of Class (Swastika) and table of Class notations, Periodical Surveys and Spare gear. To reflect as a truly Indian Class society, the developers then decided to have Sanskrit names for class notations which was unique to IRS. At that time, spare gear was included as a requirement, though later it has been changed into a class recommendation.



Though the first Rules of IRS was published in 1977 it was far from comprehensive as it did not have requirements for materials or for design and construction of hull and machinery. IRS thereafter embarked upon the development of Rules for these aspects which was a voluminous and tedious task requiring considerable effort for background study. The number of Surveyors at Head Office also slowly increased in the subsequent years and they could spend time on this task.

In order to discuss the specialised requirements in detail, sub committees and panels were formed by the Technical Committee. A sub-committee meeting for Hull Rules held in July 1979 made an important decision that IRS hull rule formulations will follow a scientific forward-looking approach with clarity on loads and permissible stresses rather than the empirical approach followed by some of the traditional Class Societies of that time. This decision made with foresight helped IRS much later when IACS requirements and Common Structural Rules were made using this scientific approach.

Discussion and approval by the Technical Committee on various chapters of piping systems were carried out from the 8th Meeting in October 1980 to the 11th meeting in February 1983. Additionally, the rules on materials (present Part 2 of Main Rules) were approved during the period from the 10th meeting in October 1982 to the 13th Meeting of the Technical Committee in September 1983. These rules were prepared



in consultation with panel of experts on materials formed for that purpose.

Various chapters on design and construction of machinery and electrical installations were approved during 1983 to 1985 in TCM 13 to TCM 23, which was ably assisted by expert panels on prime movers and propulsion shafting systems and on boilers and pressure vessels. Meanwhile the sub-committee on hull rules was discussing scantling formulations for various parts of the hull structure. The Technical Committee discussed and approved the hull rules chapters from the 23rd meeting in 1985 to the 30th meeting in 1986.

Capt. R. D. Kohli stepped down as Technical Committee Chairman at the end of 1986 after a long innings that started in 1976. His able guidance and leadership helped in steering the committee through these challenging formative years. The Committee appreciated his contributions at the 30th meeting in 1986, when Mr. E J D'Sa of Shipping Corporation of India was elected chairman for 1987 and 1988.

After discussions on some amendments to the approved Rules in 1987, The Technical Committee decided at the 32nd meeting in January 1988 that the comprehensive Rules of IRS would be issued on 05 April 1988 to coincide with the National Maritime Day. Thus the new main Rules for Seagoing Steel Ships, Editions - 1988 was published which covered Part 1 General, Part 2 Materials, Part 3 Hull and Part 4 Machinery which was sufficient for general requirements applicable to all types of vessels. At the 33rd Technical Committee meeting in August 1989, Mr. R. L. Pai of L&T Shipping Division was elected Chairman of the Committee.

Having published the first set of comprehensive seagoing ships Rules for general purposes, IRS turned its attention to two other immediate needs. Firstly, realising the increase in demand for classing inland waterways vessels, development of Inland waterways vessels Rules started in 1989. Secondly, the seagoing ships Rules were still lacking in requirements for Special ship types. So, the development of Part 5 of the Seagoing ships Rules were also taken up.

As a beginning, in the 34th and 35th Technical Committee meetings in 1989-90, chapters of IW Rules for Piping and Machinery were discussed. Further in the 36th Meeting in 1991, two chapters of Seagoing ships Part 5 "Special ship types" – Chapter 3 Chemical Carriers and Chapter 4 Liquefied gas carriers were considered by the Committee. However, publication of Inland waterways Rules and full set of Part 5 of the Main Rules could only be done later after discussion of all chapters.



The development of Rules in these formative years was very challenging and it would not have been possible without the hard work and dedication of the employees especially Mr. D. G. Sarangdhar and Mr. S. Kumar who contributed to the Rule development work in addition to their other duties and responsibilities and the guidance of the Technical Committee members.

The formative years 1975-1991 can be termed as the pre-IACS period as it was in 1991 that IRS became an Associate member. During this period, IRS did not have access to IACS working groups or their developmental activities and hence had to depend on the study and evaluation of the background of the publications of other Societies to a large extent. The subsequent period of rule development will be covered in the next 2 editions

Exclusive Interview with Captain JC Anand



At the outset, Captain JC Anand expressed his happiness at IRS having reached its 50th year of excellent service to the Maritime Industry.

You have been closely associated with the formation and growth of IRS in its early days. Could you elaborate the challenges faced and some interesting moments you remember during this journey?

It was Sir Ramaswamy Mudaliar who recommended to the Government that India should have a Classification Society. He travelled to Egypt to attend a meeting of Classification Societies and was convinced that Indians have the expertise and knowledge to set up and run a ship classification Society.

Later INSA took up the task with the Government for formation of a Classification Society in India. I took the then Secretary Shipping Mr. M.G Pimputkar to the offices of other Classification Societies around the world to see their working. Mr. Pimputkar strongly supported the formation of IRS. I can say that without Mr. Pimputkar, IRS could not have been established. Mr. Pimputkar was a principled man from whom I have learnt many things.

I was also involved in convincing Surveyors to join IRS to start its functioning. Mr. H.S. Rao who was the first Chief Executive of IRS initially avoided meeting me while he knew what I wanted from him. Later, after much effort he agreed to join me for a cup of tea. He quickly finished the tea and asked me whether he could leave. I persuaded him to sit and talk further and could ultimately convince him to join IRS.

What about the challenges faced by IRS in obtaining IACS Membership?

IRS became IACS Member in 2010 which is after 35 years of effort since its inception. It is primarily due to the technical competence of IRS employees that we could become IACS Member. We should thank Government of India for starting various institutes and colleges which provided the required education to our employees.

In this regard, I would like to mention three IRS directors who helped us in our efforts to get IACS Membership: namely Mr. Venkiteswaran, Mrs. Kiran Dhingra and Mr. K. M. Sheth.

Indian government, especially secretary Mr. D. T. Joseph assisted IRS in its quest for IACS membership

It was at the IACS meeting at Hamburg that a final decision was made by IACS.

IACS Chair gifted me a watch and said that our time has come.

Can you tell us some interesting incidents during your earlier days on board ships which has influenced your future career in ship owning and in class?

When I was a 2nd officer on board, one day a shipowner's representative came on board and ordered to stop cargo operations. While I argued with him asking for the written order from relevant authority to stop the work, I was told by my colleagues that he being shipowner has the power to stop operations.

After that incident I decided that one day I should also become a shipowner.

Initially I approached APJ Shipping who were selling some ships to get them on bare boat charter. However, this was not successful. Later on I went to Chowgules and bought Liberty ship for INR 13 Lakhs where I paid 75000/- from my own funds. However, we needed a guarantor and I met Mr. V.K. Shah who was Chairman of New India Assurance who agreed to give guarantee. It was Mr. Vasant Vaidya who convinced Mr. V. K. Shah that we are hardworking and good ship operators who can be relied upon. Later on, with this success of the first ship I could get the 2nd ship. Through this, I learnt that if you have the will to do something and never give up, you will ultimately succeed.

The Chairman of a foreign Class Society visiting India. was treated with excessive respect. I also remember, while I was working in a Shipping Company, as a 2nd officer, a general perception that Indians were not technically competent in the role of a Class for issuing such international certificates. With the establishment of IRS, we have demonstrated that Indians also can run a Class Society and issue Certificates to vessels plying internationally.

What is your message to IRS when we are in the 50th year of its successful service to the Maritime Industry?

IRS should contribute in a manner, which would increase its reputation as a great Classification Society.

IRS should arrange meetings with senior people in other organizations and get their views about IRS and how it can improve further.



Mr. Chitnis Reminisces About His Time with IRS

Firstly, on this excellent achievement of having reached 50th year, let me congratulate each and everyone associated with Indian Register of Shipping (IRS) and who contributed to its growth.

I have many sweet memories associated with my tenure at IRS. I still remember my interview at IRS Head Office which was at that time located within the Shipping Corporation of India (SCI) building at Nariman Point. IRS later shifted to Maker Towers in Cuffe Parade.

In 1975, when I decided to take up a shore job, a Lloyds Register of Shipping Surveyor whom I met in Visakhapatnam advised me to apply for a job in IRS. I applied for the post of a Surveyor in IRS and was called for an Interview. I was interviewed by a panel consisting of Mr. H. S. Rao, Mr. Khare and Capt. Kohli of SCI, who was CEO of SCI at that time. I was selected based on the interview and a very strong recommendation by Mr. Sathe who was a senior executive in Scindia Steam Navigation Company office.

I joined IRS at its Mumbai office in July 1976 and soon picked up the nitty-gritty of what my work demanded of me as a field (outport) Surveyor.

I received excellent training and coaching from Mr. H. K. Taneja, Mr. S. R. Khare and Mr. H. S. Rao. Mr. Taneja accompanied me on a few surveys initially and showed me the basics of Hull and Machinery surveys. I also used to consult him as well as a few of my colleagues for survey matters when necessary.

At the end of every working day, Mr. Rao used to walk from IRS Office to his residence somewhere in Kambala Hills. He made some of us walk with him and gave very interesting advice on the survey regime. His car, with his driver used to follow us all the way up to the Wilson College Crossing.

I still remember my first survey alone. All the things I learnt as a shipboard engineer and as a Surveyor after joining IRS, kicked in and soon I started doing surveys by myself with growing confidence.

After 1980, IRS started growing at a fast rate and was accepted, by IACS as an associate member. The number of Surveyors at outports as well as at the Head Office grew exponentially.

During my last eight years in IRS, I got an opportunity to attend meetings of Maritime Safety Committee of International Maritime Organization (IMO) during its summer and winter sessions.

I continued working with IRS for a long time as it was very close to my heart. I retired at the end of February 2003 as a Chief Surveyor with excellent reputation.

Once again, **“Bravo IRS and keep it up”**.



Safety Meets Science: IRS and NIOT - A Synergistic Partnership Propelling Ocean Exploration



Dr. G. A. Ramadass
National Institute of
Ocean Technology, Chennai

The vast expanse of the ocean holds countless mysteries, beckoning scientists to delve deeper and unlock its secrets. National Institute of Ocean Technology (NIOT) plays a vital role in unlocking these secrets of the ocean. But before their research vessels can set sail and delve into the deep, they need to ensure they meet the highest safety standards. This is where the Indian Register of Shipping (IRS) comes in, providing a comprehensive suite of services that empower NIOT's research endeavours. This article elucidates the collaborative partnership between the Indian Register of Shipping (IRS) and the National Institute of Ocean Technology (NIOT) built on a common goal i.e., ensuring the safety and efficacy of India's marine research & technology development missions. This collaborative spirit has fostered the development of advanced research vessels that play a pivotal role in expanding our understanding of the oceans.

Collaboration, Safety, Technology, Partnership, Ocean Exploration.

Introduction:

Indian Register of Shipping (IRS) is a leading international classification society, established in 1975. They are a non-profit organization dedicated to providing independent technical inspection and certification services for ships and marine craft, offshore installations and other maritime and industrial projects. IRClass plays a vital role in the maritime industry by promoting safety, environmental protection, and efficient operations. Their commitment to excellence makes them a trusted partner for ship owners, operators, and other stakeholders in the maritime sector.

National Institute of Ocean Technology (NIOT) is India's premier research institute dedicated to advancing knowledge and technological capabilities in the ocean domain. Established in 1993, NIOT plays a pivotal role in conducting research & development on various aspects of the ocean viz., Ocean Technology Development: Designing, developing, and deploying innovative technologies for ocean exploration, resource utilization and environmental monitoring, Ocean Observation and Services: Establishing and maintaining ocean observation systems to collect real-time data on various oceanographic parameters, Ocean Resource Management: Contributing to the sustainable development and management of ocean resources for the benefit of the nation. NIOT stands at the forefront of India's ocean research & technology demonstration, propelling the nation towards a deeper understanding and responsible utilization of the vast and vital resource.

Sagar Nidhi



From Shipyard to Deep Sea: A behind-the-scenes look at IRClass and NIOT's Collaboration:

Sagar Nidhi is a vital asset for India's ocean research & technology demonstration endeavours. IRClass had significantly collaborated with NIOT towards ensuring Sagar Nidhi's safety and operational integrity right from its construction phase at M/s Fincantieri Shipyard, Italy during 2005-07. IRClass Surveyors had reviewed and approved

Sagar Nidhi's design plans, ensuring compliance with international safety regulations and classification standards. This would involve scrutinizing aspects like hull strength, stability, fire safety, machinery systems and lifesaving equipment in Italy throughout the construction process. In addition, they had physically inspected Sagar Nidhi's construction and overseen the quality control processes at the shipyard, ensuring the use of certified materials and adherence to best practices during construction to verify they met the approved plans and classification standards. Sagar Nidhi has been under scientific service for the past 17 years and is still a front-runner with respect to state-of-the-art scientific & technology demonstration facilities and one of the most preferred Research Ships by the Scientific community, which has fetched a lot of laurels in our country.

Similarly, IRClass had collaborated with NIOT towards ensuring the quality and operational integrity of two identical coastal research ships - Sagar Tara & Sagar Anveshika, by deputing dedicated Surveyors to oversee the entire process right from its conceptual design phase till delivery at M/s Titagarh Shipyard, Kolkata during 2018-20 within contractual time & cost.

Sagar Tara



Sagar Anveshika



Based on experimentations done and research on welding techniques, NIOT provided technical solutions to Shipyard for superstructure marine grade Aluminium welding and back strip welding of steel structure, bi-metallic strip welding & welding procedure for joining of steel and aluminium, which was also approved by IRClass. This solution has resulted in better finish on welded surface, no post weld machining required, saving of cost and time and better quality of welding. This has also enabled saving of time towards ship building & better quality control. These engineering solutions have become a part of IRClass's technical manuals.



Ceramic Back-strip welding in Thruster Tunnel of Sagar Anveshika & Hull of Sagar Tara

From Standards to Solutions: IRClass's collaborative role in NIOT's Technical Endeavours:

Numerous engineering coastal solutions were implemented onboard Research Ships by NIOT in collaboration with IRClass, For instance, ship's propeller shaft had to be replaced once in every two years due to crevice corrosion on bearing area as a result of ingress of sea water through the shaft seals. It involves huge cost and long lead time for procurement of shaft. To resolve this issue, propeller shafts were refurbished by implementing clad welding technique & they are working effectively thereafter. Expenditure incurred towards this work was 10% of actual cost of propeller shaft, which saved huge cost and lead time for import.



Deep pitting on bearing surface



Fatigue test specimen

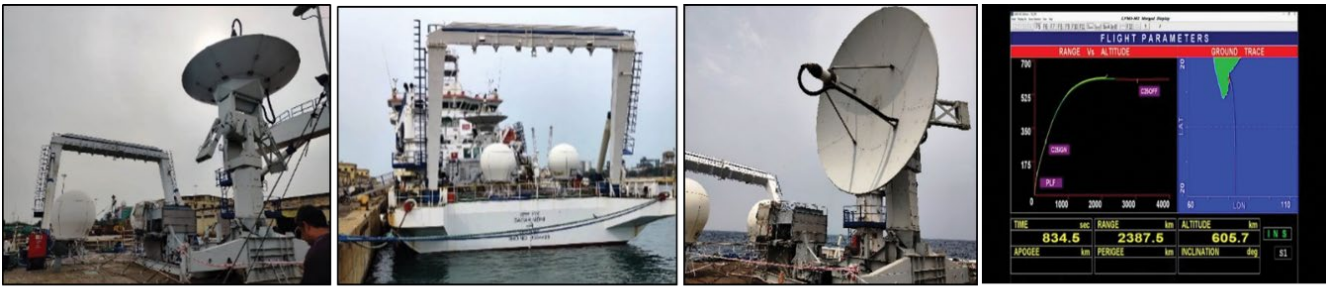


Propeller shaft machining



ND tested welded shaft

NIOT and ISRO Telemetry, Tracking and Command Network (ISTRAC) have jointly collaborated in providing [Telemetry Tracking & Command] TTC support for launch vehicle from ships on high seas. After completion of extensive cruise preparatory activities within a short span of time, a Ship Borne Transportable [SBT] Antenna Terminal weighing around 20 tons to support TTC station was proposed by ISTRAC to be installed onboard NIOT's Research Ship-Sagar Nidhi for Geosynchronous Satellite Launch Vehicle Mark III [GSLV Mk III] launch mission of ISRO. For installation of this SBT antenna terminal onboard Sagar Nidhi, critical points like deck strengthening, point load of tracking system, stability calculation, lashing arrangement for securing SBT system were identified by NIOT team and proposed to IRClass for verification & approval for installation. NIOT & IRClass jointly completed the entire installation & testing process within short span of time. On 23rd October, 2022 at 00:07 hrs, GSLVMk-III was successfully launched from Satish Dhawan Space Centre [SDSC], Sriharikota launching station and SBT team from Sagar Nidhi tracked the trajectory of the launch vehicle and confirmed the separation event of satellites. Efforts of synchronized professional team work between NIOT & IRClass in ensuring success of this prestigious mission through Sagar Nidhi was well appreciated by ISRO.



ISTRAC Ship Borne Transportable [SBT] antenna terminal & C Band radar installed onboard Sagar Nidhi

Sagar Nidhi is equipped with a Launching and Retrieval System [LARS], a crucial component that facilitates the safe and efficient deployment and retrieval of the Remotely Operable Submersible (ROSUB), Polar ROV (PROVe) etc., during deep-sea operations. The deck needs to be strong enough to support the weight of the LARS itself, ROSUB and the tether cable during deployment and retrieval. This involves checking the maximum allowable deck load and comparing it to the combined weight of the LARS and ROSUB. These technical calculations were prepared by NIOT and submitted to IRClass, which was verified and certified by IRClass after thorough examination and testing. This resulted in the successful qualification of Deep Sea Work Class ROV-ROSUB6000 developed by NIOT at 5256 m depth and sampled manganese nodules in the Central Indian Ocean Basin during 2010. That was for the first time a ROV had gone beyond the depth of 5000 m in the Central Indian Ocean Basin (CIOB).



LARS for ROSUB6000 onboard Sagar Nidhi

Polymetallic nodule collected in ROV core sampler & Indian Flag was planted using the ROV

Stronger Together: A Win-Win Future for Ocean Exploration:

IRClass representatives have been a part of most of the Technical Expert Committees of NIOT Projects viz., Project Monitoring & Coordination Committee [PMCC] for Acquisition of new Research Vessels, Technical Waiver Board (TWB) of NIOT's indigenously-developed deep-water manned scientific submersible Matsya 6000 & etc., Similarly NIOT representatives have been a part of Technical Committee of Indian Register of Shipping (IRS).

This collaborative spirit between IRClass and NIOT is a shining example of how strategic partnerships can propel scientific & technological progress. As we continue to work together, we can expect even more advanced research vessels to be built, equipped, and operated safely. This paves the way for ground-breaking discoveries in the ocean domain, leading to a deeper understanding of our planet's oceans and the vital role they play in the Earth's ecosystem.

This partnership is not just about ensuring the safety of vessels and crew; it's about creating a platform for scientific exploration to flourish. With IRClass providing the bedrock of safety and NIOT spearheading cutting-edge research, the future of India's ocean exploration appears to be bright. The combined expertise of these two organizations is certain to propel India's marine research and technology development endeavours to even greater heights in the years to come.

On this momentous occasion, we wish IRS a bright future ahead!!

Celebrating 50 Years of Excellence with IRS: A Tribute from Kanagawa Dockyard

As Japan's premier tugboat builder, Kanagawa Dockyard Co., Ltd. has been a cornerstone of the maritime industry for over 90 years. With a legacy of constructing more than 780 vessels & over 700 tugboats, we take immense pride in our heritage of technical excellence and innovative design.

Our long-standing collaboration with the Indian Register of Shipping (IRS) exemplifies our commitment to quality and international partnership. For the past 20 years, we have worked closely with IRS and our exclusive overseas marketing partner, Kowa Company Limited, Japan, to deliver superior tugboats to our esteemed customers in India. This partnership has resulted in the successful construction of more than 35 tugboats, each a testament to our shared dedication to maritime excellence. Even during the challenging times of the global COVID-19 pandemic, we successfully delivered around seven tugboats on schedule, maintaining the highest standards of safety and quality, thanks to the unwavering support from the IRS team.

In response to the global shift towards greener maritime solutions, Kanagawa Dockyard has pioneered the construction of Japan's first LNG-fuelled tugboat in 2018 and the country's first electric tugboat in 2022. These vessels are designed to support net-zero Greenhouse Gas (GHG) emission goals without compromising on performance, highlighting our dedication to sustainable innovation. Moving forward we would like to introduce advanced green ship technologies from Japan to India in collaboration with IRS. This would strengthen our commitment to the maritime industry & propels us towards a sustainable future.

We are thrilled to celebrate IRS' 50th anniversary and look forward to continuing our fruitful collaboration. Together, we aspire to push the boundaries of shipbuilding and deliver unparalleled value to our customers around the globe.

Warm regards,



T. Ikoma
President
Kanagawa Dockyard Co., Ltd.





HSL Reflects on Journey with IRS



Cmdr Hemant Khatri
CMD, Hindustan Shipyard

As Indian Register of Shipping (IRS) stands at the threshold of its Golden jubilee milestone, I & my colleagues at Hindustan Shipyard Limited (HSL) would like to extend congratulations and best wishes to IRS & all its team members.

Classification societies are independent, organizations that are known to set standard for the design, maintenance & repair of ships and offshore structures. They are authorized by flag administrators of various countries to survey & classify ships and issue internationally required compliance certificates including those for SOLAS (Safety of Life at Sea), MARPOL (Marine Pollution) and the Load Line Conventions on their behalf.

IRS was established by the Government of India in March, 1975 to ensure that **India has its own Ship Classification Society** to promote the national maritime interests & serve as a nucleus for R&D in shipping, shipbuilding & allied industries. It is encouraging to see that in last 10 years, IRS has made rapid strides expanding its global footprint as well its technical prowess in all facets of maritime activities.

As important stakeholders of India's Maritime sector, IRS & HSL have a long standing association & a shared vision to build ships that carve a legacy of excellence in quality. From design intricacies to engineering precision & robust manufacturing practices, each ship built with joint efforts bears hallmark of highest quality standard & ingenuity.

During my tenure at HSL, I have witnessed IRS deliver excellent service standards both in Naval

and commercial shipbuilding as well as ship repair business. Few important projects includes Life Extension of Drill Ship Modu Sagar Bhushan, Modification works on Vishwa Chetna (Bulk Carrier of SCI), construction of 50T tugs to Indian Navy, construction of two Diving Support Ships (DSVs).

One factor for our ease of comfort in working with IRS has been their willingness to recommend possible solutions, IRS has often demonstrated their professional approach and ability to best understand users requirements, willingness to adapt & examine problems utilizing their database of most of the ships built in India, IRS is also the only class that is engaged in submarine refit as well and has so far accomplished the task allotted effectively thus helping yard and Navy achieve desired timelines on Sindhukirti NR.

As we jointly look towards the horizon, we are pleased that Indian Register of Shipping (IRS) will be providing classification services for numerous platforms of Navy, Coast Guard and Mercantile fleet to meet National Maritime Vision 2030.

With the legacy built on integrity, dedication, and the current leadership's relentless pursuit of excellence, the future holds boundless opportunities for continued growth, expansion and continuous endeavours to build a stronger, safer and greener maritime nation.

I along with my entire team at HSL extend best wishes to team IRS on their journey ahead towards 2047, by when India would be a developed nation with significant presence in global maritime sector.

A Journey of Collaboration: Seven Islands Shipping & IRS



Mr. Clayton Pinto
MD & CEO, Seven Islands
Shipping Limited

On behalf of Seven Islands Shipping, I extend our congratulations to IRS on reaching this incredible milestone of 50 years. The leadership and the various teams at IRS have always demonstrated utmost dedication for ensuring maritime safety, excellence in classification services, and encouragement for innovation. With these values, they have significantly contributed to Indian shipping industry's progress.

Right from the acquisition of our first vessel - M. T. Seven Islands in 2003 till date, our association with IRS has been enriching. We have always witnessed its professionalism and expertise, which have not only bolstered our fleet's reliability but also enhanced overall safety standards of the maritime industry. Efforts of Indian Register of Shipping (IRS) in promoting sustainability and safety at sea are commendable and inspire confidence among shipowners worldwide.

As stakeholders in this fast changing and complex industry, we recognize the importance of continuous improvement and collaboration in achieving these milestones.

As India's prominent shipping Company, Seven Islands understands the importance of protecting our planet for future generations. Our tankers and gas carriers cater to the nation's growing energy demand. We work closely with IRS to explore solutions, sustainable practices and eco-friendly technologies to make our ships safer, lower our environmental footprint and promote environmental stewardship throughout our operations.

As IRS celebrates its golden jubilee, we have pleasure in reflecting on the achievements and milestones. Its leadership and vision have set benchmarks that have transformed Indian maritime seascape, paving the way for a safer and more efficient industry.

Here's to celebrating this momentous occasion and to many more years of collaboration and success together. May your legacy continue to shine brightly in the maritime world.





Sanmar Shipping Ltd. Celebrates Journey with IRS

It is indeed wonderful news, that Indian Register of Shipping (IRS) has entered its 50th year since inception.

The rise of the modern-day Japan and Germany post World War II was a result of diligence, hard work and innovation. Amidst such a rise from the ashes, one could see industry flourishing, both in Japan and Germany. While the other industrialised nations of the G-7, such as the US, the UK, Italy, France, did continue to grow, it was the old school work ethic of hard work and sincerity, coupled with the push for technology and innovation that gave the much needed impetus in the two nations, Germany and Japan.

The underpinning argument for Quality Assurance, came to the fore unequivocally, in a globalised world.

The classification societies provide just that. Quality Assurance is an important sphere of our daily life, and which is offered by classification societies with great dedication and professionalism. Such assurance encompasses not only ships or boats, but also various industries ranging from Steel to Chemicals to Tea to Edible

oils and many others. It also covers systems and process building.

In a world where the advanced nations have established Class societies such as, Lloyd's Register, American Bureau of Shipping, Det Norske Veritas, Bureau Veritas, Class NK, RINA, etc and with most clients seeking out such established names, India and its eco system had to nurture a similar venture to cater to Indian interests, with an intention to progress beyond the borders, and occupy its rightful place in the comity of nations.

Peninsular India is a story well known, for its natural resources and innumerable opportunities in the field of marine industry. Indian Register of Shipping (IRS) was born out of a need to cater to such interests, and it has grown steadily and steadfastly over the last 49 years.

When it was set up in 1975, the organisation had to contend with established players in the classification world. That was never going to be easy. It required dedication, commitment, dexterity and professionalism to overcome not just the pitfalls, but the self-doubts and the doubters too. Less than 30 years into independence, IRS



Mr. C V Subba Rao

Managing Director
Sanmar Shipping Ltd.
The Sanmar Group



dared to take on the field, which was crowded, but now it has become a major Class Society to reckon with.

Step by step, the organisation built itself from scratch, with a team of professionals whose only goal was to follow a process, without looking at the established players and just wonder. A process that was methodical and a process so crisp, that over time, it became second nature for many organisations, that now work with IRS for their quality assurance.

It has always been and continues to be a friendly organisation to work with; one may approach IRS for any problem that one faces during the currency of life of an asset. The professionalism exhibited by the organisation is peerless, more so by being virtually the primary Recognised Organisation (RO), for the Indian Flag Administration, and from whom Indian ship owners do not hesitate to seek counsel.

It is a matter of great pride that being the national classification society, IRS has made inroads into the foreign domain and has been the RO for other Flag Administrations as well.

At Sanmar Shipping, we have always been enjoying a wonderful relationship with IRS and have benefitted from its advice in all relevant matters. Our ships have always received the greatest of attention, including many times outside of office hours, the nature of the industry that we contend with.

It has been a pleasure working with IRClass, and on behalf of The Sanmar Group, I wish Indian Register of Shipping (IRS), its leadership team and all its officers and staff, Good Luck and Godspeed.

Data Quality



Mr. Girish P. Kulkarni
Senior Surveyor
– PAC Electrical &
Control Systems



Data plays a pivotal role in the marine industry, and offshore applications. It enables real-time monitoring of vessel performance, machinery health, and environmental conditions. It facilitates predictive maintenance, fuel optimisation, route planning, and decision making for safe operations.

However, the maritime environment presents significant challenges for data collection and integration onboard ships. Harsh sea conditions, limited communication bandwidth, and the multitude of disparate onboard systems and data sources create a complex data acquisition and synchronization challenge. Addressing this challenge requires robust data governance practices, effective coordination amongst stakeholders, and the implementation of reliable data integration technologies. Ensuring data accuracy, consistency, reliability, and timeliness is crucial to derive meaningful insights and enable effective decision-making.

Data in the marine domain can be classified into various categories based on its nature and purpose. Some common types of data include:

- **Performance Data:** This includes data related to vessel speed, fuel consumption, engine performance, propulsion efficiency, and emissions.
- **Navigational Data:** It comprises data on position, speed over ground, heading, tide, weather conditions, and electronic navigational charts.
- **Environmental Data:** This includes data on weather conditions, sea state, water temperature, wind speed, and current, which are crucial for safe navigation and offshore operations.
- **Machinery Condition Data:** It encompasses data related to machinery health, such as vibration levels, temperature, pressure, oil condition, and equipment status.
- **Regulatory Compliance Data:** It involves data required to ensure compliance with international, national, and local regulations, including environmental and safety standards.
- **Operational Data:** This comprises data on cargo, ballast, trim, draft, load distribution, stability, and performance of various systems onboard the ship or offshore installation.

Common Data Quality Issues and Their Impact

Data Inaccuracy and Inconsistency:

Data inaccuracy refers to the presence of errors, inaccuracies, or mistakes in the collected data. In the marine industry, inaccurate data can lead to incorrect decision-making, compromised safety, and operational inefficiencies. Inconsistency refers to variations or discrepancies in data values across different sources or over time. Inaccurate and inconsistent data can result from human errors, sensor malfunctions, data entry mistakes, or technical issues during data collection, transmission, and processing.

For example, consider an engine performance monitoring system that collects data on various parameters such as fuel consumption, temperature, and pressure. If the sensors providing the data are not calibrated properly or if there are inconsistencies in the recorded values, it can lead to inaccurate assessments of engine efficiency, maintenance requirements, and potential failures. This can result in unexpected breakdowns, increased maintenance costs, and disruptions to vessel operations. Implementing data validation and verification techniques, automated data cleansing processes, and standardized data collection procedures can help address these issues.

Data Completeness and Integrity:

Data completeness refers to the extent to which all required data elements are present and available. Incomplete data can hinder accurate analysis and decision-making. For example, missing entries in maintenance records or sensor data gaps can lead to incomplete insights into machinery health or operational performance. Data integrity refers to the accuracy, consistency, and reliability of data throughout its life cycle. It ensures that data remains unaltered, free from corruption, and consistent across different systems or processes. To ensure data completeness and integrity, organizations should establish data governance practices, implement data validation rules, conduct regular audits, and enforce data quality controls. Consider a condition monitoring system that collects data on lubricant levels, vibration, and temperature for a ship's propulsion system. If the system fails to capture complete data or if there are gaps in the recorded information, it can hinder accurate analysis of machinery health and early detection of potential issues. This can result in unexpected machinery failures, costly repairs, and operational disruptions.

Timeliness and Currency of Data:

Timeliness of data refers to the availability of data within the required timeframe for decision making or analysis. In the marine industry, real-time or near-real-time data is crucial for monitoring vessel operations, machinery performance, and safety. Delayed or outdated data can hinder effective decision making, especially for time-sensitive situations. Currency of data refers to the freshness or relevance of the data to the current context. Outdated data may not accurately reflect the current state of operations, making it less valuable for decision making. Consider a condition monitoring system that detects abnormal vibrations in a ship's rotating machinery. If there are delays in receiving real-time alerts or if the data is not up to date, it can hinder timely response and preventive maintenance actions. This can increase the risk of equipment failures, unexpected downtime, and potential safety hazards for the crew and vessel. Utilizing technologies such as IoT sensors, data streaming, and automated data acquisition systems can improve the timeliness and currency of data in the marine domain.

Data Security and Privacy Concerns:

Data security involves protecting data from unauthorized access, breaches, or malicious activities. In the marine industry, data security is crucial to safeguard sensitive information, such as vessel positions, cargo data, maintenance records, and crew details. Unauthorized access to such data can lead to safety risks, operational disruptions, or even financial losses. Privacy concerns related to data involve ensuring the confidentiality and privacy of personal information, adhering to applicable data protection regulations, and obtaining informed consent for data usage. Consider a shipping company that stores machinery data on a cloud-based platform. If there is a data breach or unauthorized access to the platform, it can lead to the theft of intellectual property, potential sabotage of machinery, or safety risks. Protecting data through encryption, access controls, and regular security audits becomes crucial to mitigating these risks.

Emerging Technology Trends in the Maritime Industry:

- The increased use of Big Data and the Internet of Things (IoT) has a significant impact on data quality. For example, consider a ship's propulsion system equipped with dozens of sensors churning out a constant stream of data on temperature, pressure, vibration, and fuel consumption. This high volume, diverse data set i.e. Big Data can be analysed to reveal hidden patterns and trends, enabling predictive maintenance by identifying subtle anomalies that might foreshadow potential failures before they occur. A cargo hold is typically equipped with numerous IoT sensors which are used for monitoring temperature, humidity, and CO₂ levels. This real-time data stream allows continuous optimization of storage conditions for sensitive cargo, preventing spoilage and ensuring quality delivery. By seamlessly interconnecting with other onboard systems, the IoT-powered cargo monitoring system can automatically trigger ventilation adjustments or alerts for potential issues, creating a safer and more efficient environment for valuable cargo.
- Artificial Intelligence (AI) and Machine Learning (ML) techniques can be utilized for data profiling, anomaly detection, and predictive data quality assessment. These technologies can automatically identify patterns, anomalies, and data quality issues, allowing for proactive data quality maintenance and improvement. For example, an AI/ML system used in analyzing lubrication sensor data for critical ship machinery. The system can learn normal vibration patterns and oil pressure fluctuations, automatically detecting unusual deviations that might indicate early wear or impending failure.
- Robotic Process Automation (RPA) can automate repetitive data quality tasks, such as data validation, cleansing, and transformation. By reducing manual intervention, RPA can improve efficiency and accuracy in data quality assurance processes. For example, an RPA bot can automatically extract and validate fuel consumption readings from sensors across the ship's engines, eliminating manual transcription errors and inconsistencies.
- Natural Language Processing (NLP) techniques can be employed to analyze and understand unstructured data, such as text documents. This helps in extracting valuable insights and ensuring data quality in diverse data formats. For example, NLP can sift through unstructured crew reports on engine vibrations, extract keywords and patterns describing vibration anomalies, and flag potential issues for further investigation.
- Blockchain Technology can enhance data quality by securing the entire maintenance history of a ship's propulsion system. For example, every sensor reading, maintenance action, and inspection report for the engines can be securely locked onto a shared, unchangeable record i.e. a digital logbook.

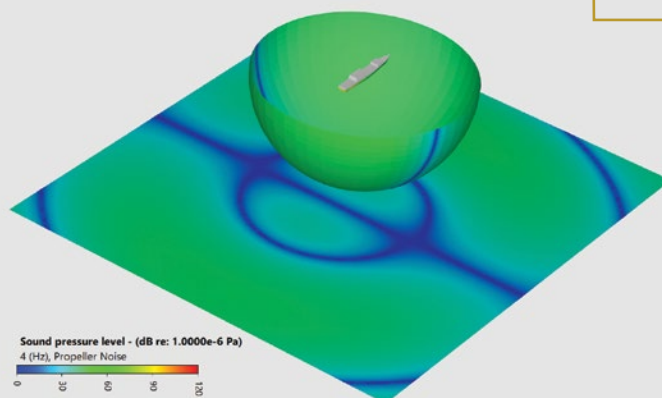
The maritime industry is indeed witnessing a data quality renaissance, and IRClass is actively working towards bringing this transformation to the forefront. The meticulously curated data will fuel the development of robust datasets, empowering machine learning algorithms for predictive maintenance and real-time health monitoring. This not only promises optimized maintenance schedules and potential failure prediction, but also paves the way for broader industry advancements in data-driven solutions.

Underwater Radiated Noise (URN) from Ships: Part 1- Introduction



Mr. Akula Chaturvedi

Senior Surveyor,
Hydrodynamics &
Multiphysics Dept,
Research & Development



Underwater Radiated Noise (URN) refers to the sound energy emitted underwater, often originating from various sources such as ships, SONAR systems, seismic exploration, and industrial activities. This noise can propagate over long distances in the marine environment, impacting marine life by interfering with communication, navigation, feeding, and other vital behaviours. Commercial shipping serves as a significant contributor to URN, posing a substantial threat to critical life functions across a wide array of marine species, including marine mammals, fish, and invertebrates.

Research from various sources suggests that the background noise level in the world's oceans is increasing twofold approximately every ten years. This trend is driven by the expanding volume of shipping activities and advancements in marine resource exploration and extraction technologies. Consequently, anthropogenic noise levels in marine environments are projected to rise further in the years ahead. Researchers highlight the growing number of vessels and ships as one of the foremost threats faced by marine organisms.

Steps taken by IMO

The International Maritime Organization (IMO) has recognized the escalating concerns surrounding underwater noise pollution stemming from ships, predominantly commercial vessels, prompting a revision of its guidelines to mitigate the detrimental impact on marine ecosystems (2023 IMO Guidelines on Underwater Noise Reduction, IMO MEPC.1/Circ.906). These revised guidelines are effective from 1st October 2023 and revoke previous guidelines MEPC.1/Circ.833.

The guidelines assist shipowners and designers in incorporating underwater noise management considerations from the outset of the design process. For existing ships, the guidelines advise implementing management plans to the extent feasible and practical. Such proactive planning not only enhances understanding and management of underwater noise but also boosts operational efficiency and decreases fuel expenses.

In September 2023, the IMO convened a workshop at its headquarters to explore the correlation between Energy Efficiency and Underwater Radiated Noise (URN) from Ships. It is recognized that many measures aimed at reducing Greenhouse Gas (GHG) emissions may also lead to a reduction in URN. Furthermore, the revised guidelines address the establishment of incentive schemes to bolster URN monitoring programs and support noise reduction efforts.

GloNoise Project with India as one of the Lead Pilot Countries

Additionally, the IMO has initiated the GloNoise project in 2024 to form a worldwide coalition and aid developing nations in addressing the significant environmental challenge of underwater noise pollution originating from the shipping industry. India is one of the six Lead Pilot Countries (LPCs) chosen by the IMO, alongside Argentina, Chile, Costa Rica, South Africa, and Trinidad and Tobago, to provide support in this endeavour through engagement with the private sector and strategic partners from developed nations.

This initiative is scheduled to run until 2025, aiming to cultivate a universal toolkit for "URN baseline information gathering and analysis" as well as "noise-related marine environmental risk and impact assessment". The project will entail the development and implementation of global and Lead Pilot Countries (LPCs)-level baselines, along with the assessment and reporting of risks, impacts, and policy options.

Involvement of the International Association of Classification Societies (IACS)

IACS has recognized the significance of Underwater Radiated Noise (URN) emanating from commercial shipping and has issued a recommendation document regarding the measurement of

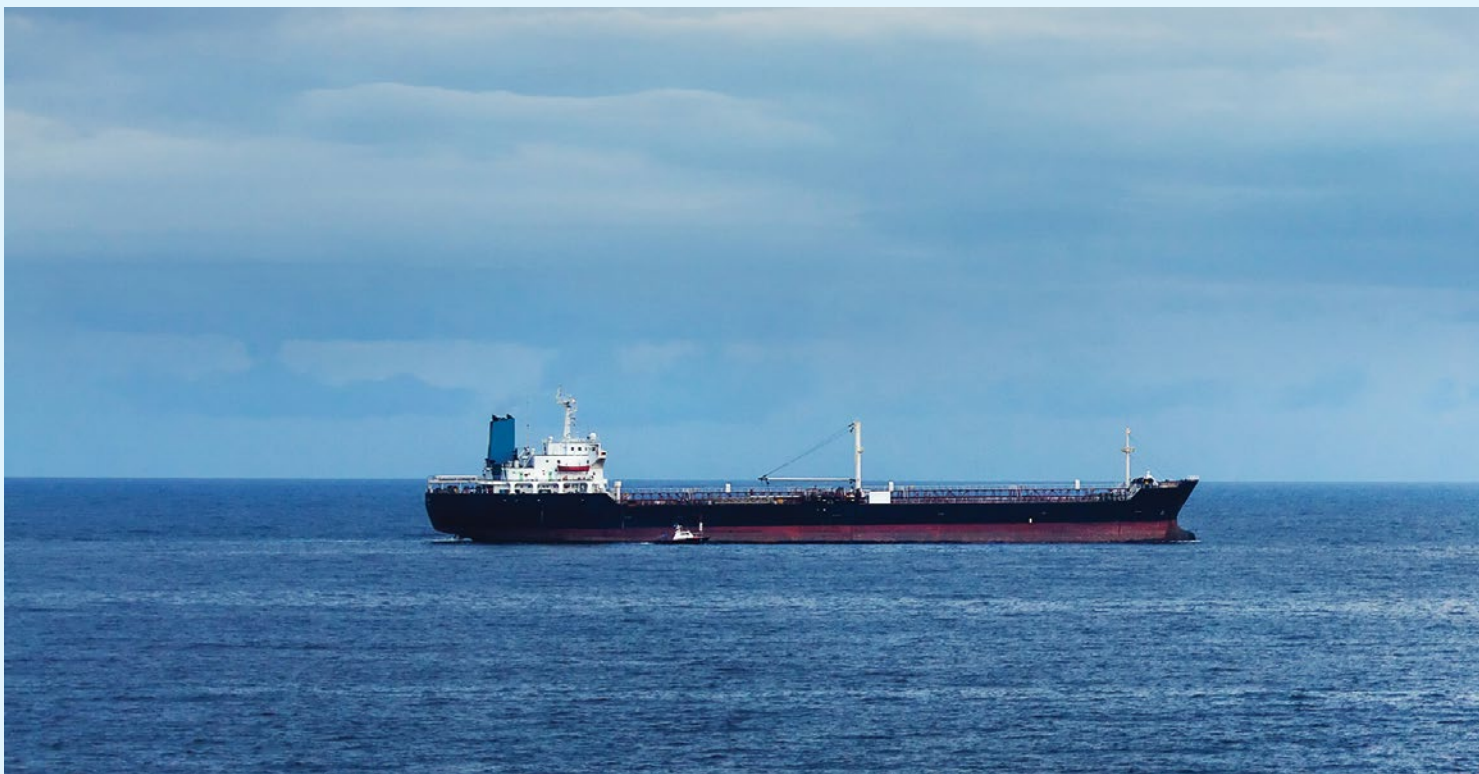
URN. Currently, most IACS members have their individual URN measurement procedures.

The document was released on 1st of September 2023, (IACS REC 176) and aims to establish a standardized and unified method for quantifying Underwater Radiated Noise (URN) measurement. This recommendation also encompasses consistent approaches for analysis, post-processing, and reporting standards.

IRS approach to the problem

IRS has recognized the significant impact of ship-generated underwater noise on the environment, prompting considerable interest in understanding its implications and the potential for regulatory measures. Since 2018, IRS has actively conducted research to predict ship URN signature, resulting in numerous research papers presented at various national and international conferences.

In July 2023, IRS released guidelines on Underwater Radiated Noise (URN) and Measurements to provide methodology and criteria for assessing URN from vessels. These guidelines, aligned with IACS recommendations, also include URN class notations for various types of ships &/or operations of ships. These notations are awarded upon successful completion of Underwater Radiated Noise (URN) measurement tests and trials, as deemed relevant and applicable.



Way ahead

The complexity of the topic is further compounded by the diverse array of vessel types, operating conditions, and the consequential impact on marine wildlife in oceanic environments, all of which require thorough consideration. The IMO has initiated an action plan known as the Experience Building Phase (EBP) to facilitate the exchange of lessons learned and best practices among Member States and international organizations regarding the implementation of Revised Guidelines.

Throughout the Experience Building Phase (EBP), projected to persist until 2026 and possibly extended, there will be a concentrated examination of the effects of reducing Underwater Radiated Noise (URN) on marine wildlife. Additionally, there will be a specific emphasis on assessing how these measures align with IMO mandates for reducing Greenhouse Gas (GHG) emissions and enhancing energy efficiency. Compliant with the most recent IMO guidelines, several ports have begun offering incentives to vessels adopting low-emission fuels and quieter technologies, underscoring a burgeoning global push to address maritime noise pollution.

Projects such as the GloNoise Partnership demonstrate the IMO's proactive stance on addressing this issue. However, further research

is essential to quantify oceanic noise pollution accurately and establish universally accepted assessment metrics to measure its impact on marine life. Currently, there is a lack of guidance criteria for noise exposure thresholds affecting marine species due to significant knowledge gaps across various anthropogenic sources.

Quantification of URN typically relies on prediction methods or underwater noise measurements at sea, with various measurement methods and standards in existence. Harmonization of these approaches at the global level is necessary to ensure consistency and accuracy in assessing underwater noise pollution from shipping activities. This harmonization effort will be crucial in facilitating effective mitigation strategies and promoting sustainable maritime practices. Future research endeavours focused on ship noise pollution and its ramifications on the marine environment will be instrumental in conserving all marine habitats. Moreover, they will serve as a crucial foundation for informing future legislative decisions and establishing noise criteria guidelines.

**“नौकाशब्दं हरेमः,
समुद्रजीवानां संरक्षणाय।”**

**"Naukashabdam harema,
samudrajevaanaam samrakshaNaaya."**





Mr. Saiprasad Gaonkar

Sr. Manager
Industrial Services - ISSPL



IRClass – Civil NDT & Structural Repair Supervision Services

Rebirth of a structure

The history of concrete is dotted with innovation, experimentation and various transitions from lime concrete to high-strength concrete. While industry demand has fostered increased strength of concrete, the durability is observed to be compromised. The competition for high-rise towers, optimum design and cheaper construction costs has ultimately led us to less durable structures. In older cities like Mumbai, Kolkata, Delhi & Chennai, we can still observe intact and functional structures which are more than 100 years old. In our experience, these older structures are more durable, architecturally planned, have thoughtful space management, and have withstood the extreme external factors for decades.

The primary aim of having RCC structure is to have safe habitation. If the periodic maintenance is ignored, then the structure does not just start deteriorating but at a higher than normal rate. This also leads to an increase in the cost of repairs, risk for the occupants and chances of catastrophic

failures. Currently all metro cities are facing issues with periodic maintenance due to lack of awareness, funds, and policy decisions. The cities also look shabby due to such poorly maintained structures. Reconstruction is not always an option since the natural resources are limited. For an engineering professional, safeguarding existing structures and saving resources is the need of the hour.

Why go for repairs:

- Every structure cannot be demolished and reconstructed.
- Resources – Repairs reduces the need for new materials.
- Cost – Systematic repair plan reduces the cost of maintenance.
- Assures safety and longevity of structure.
- Improves aesthetics.

IRClass – Structural Repair consulting services are rejuvenating the old and weak structures. A systematic program is devised from inspection, Civil NDT, retrofitting methodology, estimate of repairs and stringent supervision assuring the safety and durability of these structures.

Here is a case study detailing the rebirth of a dilapidated structure in Mumbai.

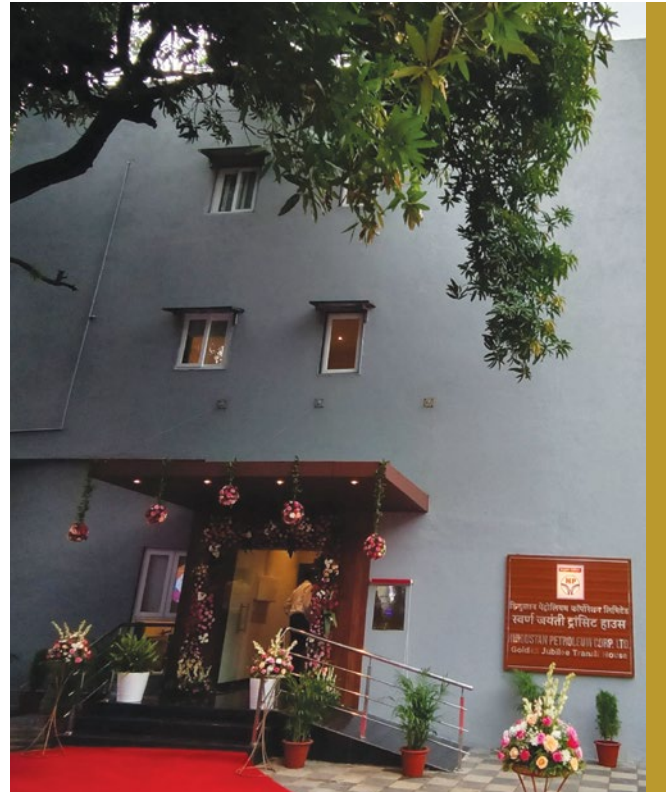
Hindustan Petroleum Corporation Limited, Mumbai decided to have a transit house with world-class facilities on the auspicious occasion of its Golden Jubilee year. Acquiring new land in one of the most crowded and costliest cities was a challenge. To circumvent this, they identified an abandoned structure which was acquired on a long lease basis. Converting the structure from dilapidated to safe working conditions was a demanding engineering feat and IRClass was approached to define and oversee the rehabilitation procedures. The end result was a safe, durable, habitable structure and our efforts and services have been much appreciated by HPCL.

Pre-repair condition of a 25 year old structure



Dilapidated condition of several external elements

Post repair transformation of structure



Quality assurance by strict supervision, post repair confirmatory survey & various tests

Inauguration of the structure



Inauguration of structure by HPCL
Chairman & MD Shri. Pushp Kumar Joshi



Team HPCL & Team IRClass

Key Press Releases



Indian Register of Shipping (IRS) commences celebrations as it enters 50th year

IRS enters 50th year, marking half a century of commitment to maritime safety, quality & innovation. The organisation commenced year-long celebrations on its foundation day 4th April by unveiling a series of initiatives.



Indian Register of Shipping (IRS) Partners with MARIN to Enhance Technical Expertise in Shipbuilding

The MoU marks an important milestone for both organisations as they collaborate to perform Hydrodynamic Studies and Model Testing on ongoing new construction projects.

Indian Register of Shipping (IRS) and Government of Uttar Pradesh sign MOU towards formation of UP Inland Waterways Authority

This collaboration aims to develop and regulate inland waterways in Uttar Pradesh, enhancing transportation efficiency and fostering economic growth.



Indian Register of Shipping (IRS) Partners GRSE for Development of Autonomous and Green Energy Vessels

The partnership between IRS & GRSE marks a significant step towards fostering innovation and sustainability in the maritime industry.



Indian Register of Shipping (IRS) reflects on 2023 and charts course for 2024 – towards a more sustainable future

In 2023, IRS saw remarkable growth and reinforced its position as a trusted maritime partner. IRS enlarged its fleet by adding more than 5 million GT and expanding its global reach with new customers from Middle East, Europe & Asia Pacific.

Indian Register of Shipping (IRS) and Indian Institute of Technology Bombay sign MOU to develop ship trajectory prediction tool

IRS & IIT Bombay have signed a Memorandum of Understanding (MOU) aimed at advancing maritime safety through the development of a ship trajectory prediction tool.



Indian Register of Shipping (IRS) releases 'Rules for Construction and Classification of Indian Naval Ships 2023'



IRS Naval Rules 2023 were released by the Hon'ble Raksha Rajya Mantri (Minister of State for Defence) Shri Ajay Bhatt, in presence of the Chief of Defence Staff, Chief of Naval Staff, Commanders-in-Chief, Principal Staff Officers, senior Commanders on 4th Sep 2023, the opening day of the Naval Commanders Conference 2023, New Delhi. Our EC, accompanied by Head Defence and Principal Naval Adviser were also present on this occasion.

CEMS forges strategic partnerships at Global Maritime India Summit 2023 to boost skill development and innovation

GMIS 2023 provided CEMS with the unique opportunity to establish strategic alliances by signing Memorandums of Understanding (MOUs) with Indian Institute of Management (IIM) Mumbai, CYIENT, Seatech Solutions International Pte & Logistics Sector Skill Council.





IRClass Systems and Solutions Pvt. Ltd. unveils Digital Centre for technology solutions

ISSPL announces the launch of a Digital Centre to offer Cybersecurity, Digital Forensics, IoT/OT Testing Lab, AI services & a wide range of technology solutions.

Indian Register of Shipping (IRS) to class innovative fleet support ships for the Indian Navy

IRS will provide classification services for a series of five modern Fleet Support Ships for the Indian Navy. The first of their type to be built in India, the vessels will be built to IRS Naval Rules.



Indian Register of Shipping (IRS) certifies Autonomous System with dual navigation capability in collaboration with Mazagon Dock Shipbuilders Ltd.

IRS rigorously tested the Autonomous Navigation System software – developed by Robosys Automation and Robotics Pvt. Ltd. – through simulation, as per the approved Factory Acceptance Test procedure.

IRClass Systems and Solutions Pvt. Ltd. launches a suite of sustainability services

ISSPL through its division – IRQS, a leading provider of management systems certification services, has announced the introduction of a pioneering initiative aimed at advancing environmental responsibility across maritime and non-maritime sectors.



IRClass Systems & Solutions announces the launch of ISSPL Development Foundation (IDF)

IDF's primary activities will include conducting vocational trainings/ seminars/ conferences for knowledge dissemination, providing updates in the field of Testing, Inspection and Certification.



Safess Quality Management and AITG Sign MoU for Technical Collaboration in EPC Projects

Safess Quality Management Pvt. Ltd., a wholly owned subsidiary of ISSPL & AITG, represented by Marathwada Auto Compo Private Limited & Preci Fab Engineers Pvt Ltd have signed a MoU to foster technical collaboration in the field of EPC.

Events, Seminars & Conferences



Foundation Day 4th April 2024 – IRS Enters 50th year

Indian Register of Shipping enters its 50th year, commemorating five decades of maritime excellence on its foundation day 4th April by unveiling a series of initiatives - Starting off the celebrations is the debut of IRS' 50th year commemorative logo. IRS also launched its new strapline, "Powered by Passion. Driven by Values" Introduction of IRS' new flag, symbolising the organisation's commitment to global maritime interests.



World Environment Day – 5th June 2024

Indian Register of Shipping (IRS) organised a "Sapling Plantation Drive" in support of this year's theme – "Land Restoration, Desertification, and Drought Resilience". The activity commemorating the organisation's 50 years with 500 saplings saw enthusiastic employee engagement full of vibrant team spirit.



London International Shipping Week 2023 - 12th-13th Sep

At this global maritime arena, IRS hosted two notable events: a Round Table discussion on "Seascope 2030 - Decarbonisation and the Human Element" and a Technical Seminar which focussed on Decarbonisation, Alternate Fuels & Human Element that gained widespread industry attention and engagement.



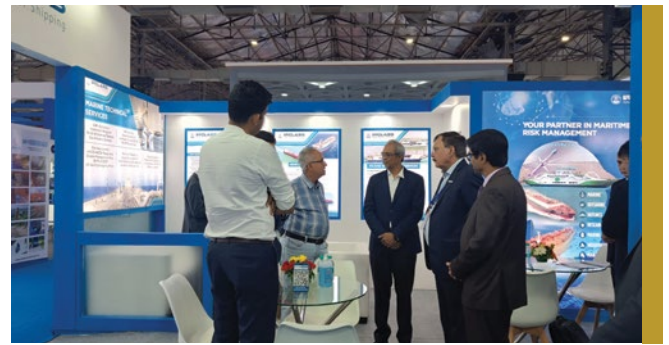
Global Maritime India Summit 2023 – 17th-19th Sep 2023, Mumbai

GMIS 2023 was a huge draw across all maritime stakeholders, with government officials from Armenia, Comoros, Nepal, Tajikistan, Turkmenistan, and ministers of Indian state governments of Andhra Pradesh, Bihar and Orissa visiting our stand.



INMEX SMM India – 4th-6th Oct 2023, Mumbai

IRS was an “Industry Partner” for the event. Honourable Minister of State for Ports, Shipping and Waterways & Tourism Govt. of India, Shri Shripad Naik visited our stand.



IRS hosted senior officials of Maritime and Port Authority of Singapore (MPA) – Feb 2024

The discussions focussed on exploring collaboration opportunities towards furthering maritime safety, decarbonisation, digitalisation & skill upgradation.



Boat & Marine Show, Sri Lanka – 27th-29th Oct 2023

IRS had a stand along with Clarion Shipping. and received good response from dignitaries and various maritime stakeholders.



IRS was pleased to support the "DMECA Alumni Meet 2024" event organised by DMET MERI Ex-Cadets Association.



One Day Seminar on Challenges to International Operations - 4th Feb 2024

Our MD, Mr. Vijay Arora was felicitated at this seminar organised by The Institution of Engineers - India.

The Maritime Standard Transportation and Climate Change Conference - 27th Sep 2023, Abu Dhabi

Our MD, Mr. Vijay Arora, spoke on "Sustainable Ship Design and Construction" at the Conference.



2nd International Conference on Advances in Naval & Ocean Engineering - ICANOE '23 3th-4th Nov '23, Cochin

IRS Research team presented four papers and won two best paper awards as below -

- Vulnerability Assessment of a Container Vessel using Second Generation Intact Stability Criteria by Anant Ajithkumar, Amresh Negi & Shivaji Ganesan T.
- Investigation of Turbulence Models to Predict Ship Airwake Using Numerical Simulations by Dr. Joseph Prabhu, Kalyanam Shanmukha Srinivas, Ram Kumar Joga & Sharad Dhavalikar.



Indian Register of Shipping (IRS) holds Seminar and Industry Interaction on Analysis and Assessment of Mooring Systems

As part of its efforts to strengthen its initiatives in this field, IRS hosted Technical Seminar on Analysis and Assessment of Mooring Systems.



Participation in Conferences & Seminars

Asian Shipowners' Association (ASA) 2024 International Shipping Forum, Hong Kong – May '24

Mr. Arun Sharma, EC, IRS shared his views in the Panel Discussion on 'Asia Shipping – Greener Together in Regulation and Compliance' at the forum.



Indian Register of Shipping (IRS) announces the superannuation of its Managing Director Mr. Vijay Arora

IRS announces the superannuation of Mr. Vijay Arora, Managing Director, after completing 34 years of dedicated service on 30th June, 2024. Throughout his tenure, Mr. Arora has made invaluable contributions to the organisation, leading with vision and commitment.



Smart Green Maritime INAvation 2024 - 29th Feb & 1st Mar 2024

The conference featured lineup of diverse participation from IRS as mentioned below -

- Mr. Arun Sharma was Chairman of Advisory Board of the event.
- Mr. Vijay Arora was part of the panel discussion on 'Smart Shipyards, Smart Ports and Cyber Security'.
- Mr. R Srinivas and Mr. Avinash Vaze participated in the session on 'Cyber Security'.
- Mr. Bhagat Singh Geda spoke on 'Maritime Autonomous Surface Ship (MASS) – Remote Operations Centre (ROC) : Regulatory Insights'.



Sustainable Shipping - Challenges & Opportunities - National Maritime Day - 1st-2nd April '24

As a part of the National Maritime Day Celebrations, Indian Register of Shipping (IRS) hosted a seminar on - **Sustainable Shipping - Challenges** at H.O on 1st April 2024.

IRS experts spoke on the below topics at the seminars held in Mumbai & Kolkata –

- Mr. P. K. Mishra, JMD & Mr. Bhagat Singh Geda, Surveyor 1 - **New Technologies & Innovations.**
- Mr. R. Srinivas, VP & Sr. Principal Surveyor - **Cyber Security & Digitalisation in Shipping.**
- Ms. Sonali Banerjee, Senior Surveyor - **Career Progression for Women in Maritime.**
- Mr. Devrup Kabi, Sr. Principal Surveyor - **Air Pollution Prevention & Energy Efficiency.**



Successful Technical Seminar on "Digitalisation & Use of AI for Efficiency Improvement of Ships" held by Indian Register of Shipping (IRS) and DMET Meri Ex-Cadets Association

The event brought together maritime professionals, industry leaders, and technology experts to explore the transformative impact of digitalization and artificial intelligence (AI) on the maritime sector.



Women in Maritime - Trials & Tribulations - 18th May 2024

- Vulnerability Assessment of a Container Vessel IRS speakers spoke at the event held for celebrating 'International Day for Women in Maritime' organised by CMMI India, IMEI India & INA.
- Ms. Janane Viswanathan shared her Insights on 'Ship Surveys & Classification'.
- Ms. Sonali Banerjee & Ms. Rupali Raj Joshi spoke on - Women in Maritime - Trials & Tribulations.



For details, visit - <https://www.irclass.org/media-and-publications/news/>

ShipTek International Conference & Awards 2024 - 24th Jan 2024, Dubai

Mr. Rajeev Pratap Rao, Head of Operations shared his perspectives on "Classification Society – Rules, Regulations and Recommendations."



International Conference on CC MARPOL 2024 - 2nd Feb 2024

Dr. Asokendu Samanta, DH, R&D spoke on the topic **Innovation and Sustainability in addressing MARPOL** organised by Indian Maritime University.



Seminar on Zero-emission Shipping - 28th April '24

Mr. Devrup Kabi shared his insights on 'Parameters for an efficient green shipping framework' at the Seminar organised by Netherlands Consulate General in Mumbai.



National Coastal Security Conclave - 8th Dec 2023

Mr. Amit Bhatnagar chaired a technical session at the Conclave organised by Rashtriya Raksha University.

Seminar conducted by JSW Jaigarh Port & Nautilus Shipping India Pvt. Ltd.

Mr. Sangameswaran C S, Principal Surveyor, shared valuable insights on "Class Surveys & Inspections."



Bunkering in India Conference organised by Hinode Services - 24th Nov 2023

Mr. Karan Doshi, Senior Surveyor, R&D gave a presentation on 'Alternative Fuels: Safety and Environmental Perspectives'.



7th International Conference on Ship and Offshore Technology (ICSOT-INDIA 2023) organised by Department of Ocean Engineering & Naval Architecture, IIT Kharagpur & The Royal Institution of Naval Architects, UK

- Dr. Asokendu Samanta DH, R&D was a Keynote Speaker on "Sustainable Shipping and Role of the Classification Societies."
- Amresh Negi, Senior Surveyor, RDAREA & K Shanmukha Srinivas, Surveyor R&D presented papers on Day 2 (9th Dec '23).
- Dr. Shivaji Ganesan T, Senior Surveyor, RDAREA, Mr. Himanshu Uppal, Surveyor, R&D & Mr. Sachin Awasare, Senior Surveyor, R&D presented papers on Day 1 (8th Dec '23).



Vessels – Classed, Launched & Delivered

Indian Register of Shipping (IRS) classed pioneering New Generation Electric Ferry launched by GRSE

Built to IRS Guidelines for Battery Powered Vessels, 'Dheu' marks the rise of green energy in maritime transportation, eliminating carbon emissions associated with diesel engines.



Indian Register of Shipping (IRS) provides inspection services for Indian Navy submarine

IRS will provide third party inspection services for the submarine, INS Sindhukirti, undergoing a 'normal refit' at Hindustan Shipyard (HSL), Visakhapatnam.

Indian Register of Shipping (IRS) classed 'INS Sandhayak' delivered by GRSE to Indian Navy

"INS Sandhayak" was built under the classification of the Indian Register of Shipping (IRS) and is the 'first of class' in a series of four such vessels being built by GRSE for the Navy.



Indian Register of Shipping (IRS) classed tugs – Sonalika and Sarovar launched in Kakinada

As single-class vessels, Sonalika and Sarovar adhere to the highest standards of safety, reliability, and performance.



Keel Laying Ceremony of First Cadet Training Ship being built under class of Indian Register of Shipping (IRS) held in Chennai

This is the lead vessel of a series of three ships that are currently being built under IRS Classification. The vessel is designed to embark 210 Naval cadets including 60 female cadets as well as cadets from overseas.

For details, visit - <https://www.irclass.org/media-and-publications/news/>

IRS is proud to be associated with the 'Ancient Stitched Ship Project' of the Indian Navy aimed at reviving India's ancient maritime legacy.



Hydrogen Powered Fuel Cell Ferry
Cochin Shipyard Ltd.

INS Androth
Anti Submarine Warfare
Shallow Water Craft (ASW SWC)

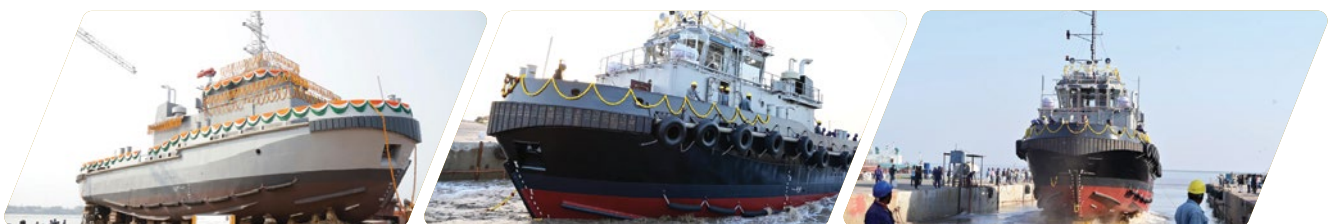


Prisha
Oil Tanker
Tisha Navigation Pvt. Ltd.

Indra
Solar-Electric Ferry
Kerala State Water Transport
Department Directorate



Classic Imperial
Ferry
Neo Classic Cruise & Tours Pvt. Ltd.



Bahubali, Bajrang & Baljeet
25T Bollard Pull Tugs (Indian Navy)

IRClass Academy has continued to flourish and strengthen its maritime training commitments by venturing into new segments for training



Academy has signed MOUs with the following leading training entities to fulfil these commitments –

- M/s Ally Maritime and Legal Services has paved the way for training in commercial and legal aspects of shipping in addition to personnel development programs.
- Stag Marine Management Pvt Ltd brings in expertise on Rightship inspection and this collaboration will enrich IRClass Academy’s domain expertise to serve the maritime industry even better.
- Beaufort Marine Services LLP - The implementation of SIRE 2.0 is around the corner & to assist the shipping industry in preparation for the requirements related to SIRE2.0, a 2-day training program was concluded with a positive response from the industry. Based on the industry response and demand further training on SIRE2.0 is scheduled shortly.

IRClass Academy continues to be instrumental in developing customised training programs to suit the needs of the industry as listed below –

- Cochin Shipyard (CSL), Kochi - Conducted in-house training programs for Structural and Machinery Designers and an in-house awareness program on understanding Class requirements in Shipbuilding.
- Mazagaon Docks Limited (MDL), Mumbai - A Series of training programs including “Mastering IRHull” encompassing the ship structural design validation with the class rules was well appreciated at MDL.



- Hull Inspection and Trial Unit HITU, Indian Navy Mumbai – A one-day seminar was conducted on IRS Class rules, regulations and procedures for survey, inspection and trials of under-construction and in-service ships.



The Indian Institute of Technology (IIT), Guwahati - In Nov 2023, IRClass Academy in collaboration with IIT Guwahati commenced the first-ever training program for underwater Class-certified welders in India.

IRClass Academy successfully delivered the first-ever Port Facility Security Internal Auditor Training Program

The training program featured several unique components designed to address contemporary security challenges. Notably, special sessions on Cyber Security in Ports and Narcotics Identification and Control were incorporated, providing participants with cutting-edge knowledge and practical skills.



For details, visit - <https://www.irclass.org/academy/>

Training

Refresher Training:



Refresher Training for Field Surveyors with 5 years of experience was held at IRS, Head Office from 11th-16th Sept 2023. The six-day training session ensured that the Surveyors were brought up to date about new rules / regulations, changes in policies, issues with surveys, reporting etc. The training provided a good platform for them to express their view and interact with the subject matter experts and top management in the Head Office. This refresher training is held at least once every year.

Induction Training:

Classroom Induction Training was held from 20th Nov to 08th Dec 2023 at the IRS Head Office. Twenty-nine Surveyors participated in this program from various survey stations & Head Office. Various topics on the Survey, Certification including the upcoming requirements of MARPOL Annex VI regulations like EEXI, SEEMP - Part III, CII; additional requirements in Ballast Water Management; SPS code along with DGS requirement; Remote survey etc. were included as part of the ten-day training program.



Training for Surveyors from Kenya Maritime Authority:

Surveyors from Kenya Maritime Authority have successfully completed the first term of their 48-month training program in Dec 2023. They will commence their second term in July 2024.

ISM/ISPS/MLC Auditor Course:

2-week ISM/ISPS/MLC Auditor Course was conducted in classroom mode at IRS HO from 29th Jan - 09th Feb 2024. The course was well-received & attended by 15 Surveyors from various survey stations and Head Office.

Employee Corner

IRClass Annual Day 2023

IRClass celebrated its Annual Day on 22nd December, 2023. The event was a joyous celebration of the organisation's achievements and a time for employees and management to come together. A highlight of the evening was the Reward and Recognition ceremony, where employees were acknowledged for their dedication and perseverance. The event also featured lively performances, adding to the festive atmosphere. It was a memorable evening as the entire IRClass team gathered to celebrate successes and strengthen camaraderie.



Navratri 2023

IRClass celebrated Navratri filled with joyous energy, colourful decorations, traditional music and dance.



Annual Sports 2024

IRClass Annual Sports 2024 received active participation from employees showcasing their sporting abilities and team spirit across a variety of indoor and outdoor events.



International Women's Day - 8th March 2024

IRS organised a Financial Awareness Session on "Women and Wealth: Navigating Financial Independence". An expert speaker empowered our female colleagues to navigate the financial landscape with confidence. Here's a glimpse into the enriching event that left everyone inspired and well-informed.



25th anniversary of Kargil Vijay Diwas

To honour the courage, sacrifice, and resilience of our soldiers, Mahindra Group launched a heartfelt campaign titled "Hearts to Bravehearts." Lt. Cdr. Bijay Nair (Navy Veteran) was selected to travel from Delhi to Kargil as part of a convoy carrying messages from citizens to Military stations and War Memorials.



Cdr. Amitabh Dube successfully completed the Annapurna Base Camp Trek. His commitment and determination in accomplishing this incredible feat are truly commendable.

Congratulations to Our New Leaders!

Indian Register of Shipping (IRS) is pleased to announce leadership appointments to further strengthen its management team.



Mr. P.K. Mishra
Managing Director



Mr. T.K. Sahu
Joint Managing Director



Mr. Rabindra Sah
Appointed as Chief Technology Officer (CTO) to accelerate its digitalisation initiatives



Mr. Rajeev Pratap Rao
Head of Operations



Mr. Saikat Roychowdhury
Operations In-Charge:
East Coast of Indian Sub-Continent & RM - SEA

Divisional Head Transitions



Mr. H. V. Ramesh
DH - Plan Approval Centre



Mr. K. Shammy
DH - Ships & Technical Services

Progression from Principal Surveyor (PS) to Senior Principal Surveyor (SPS)



Cdr. Sandeep Kumar
DH - RDAREA



Mr. Sharad Dhavalikar
HOD - Hydrodynamics & Multiphysics



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Indian Register of Shipping



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