

The South African Institute of Marine Engineers and Naval Architects

SAIMENA



The Two Oceans Journal

2nd Edition 2022

National Council 2022/2023

President

Kevin Watson

Snr Vice President & Durban Chair

Rennie Govender

Jnr Vice President & CT Chair

Graham Dreyden

Past President

Louis Gontier

Honorary Secretary

Mike Roberts

Honorary Treasurer

Cobus Visser

Grading Committee

Willem Deyzel

Org Nieuwoudt

Fellows

Dave Fiddler (Ed & SAMSA Liaison)

Iain Armstrong (TOJ Editor)

Keith Mackie

Neill Leeming

Corporate and Associate Members

Jacques de Klerk (non corporate)

Mike Roberts (non corporate)

Derek Rabie (member)

Gerard Mohamed (non corporate)

Samantha Montes (non corporate)

CONTENTS

Page No's

Council 2022/2023.....	1
Presidents Report.....	2-3
Membership status change.....	4-
Editors Desk.....	5
Certificate Handover.....	6
Leibbrandt Obituary.....	7
Trevor Forbes Farewell.....	8
Engine Scavenging.....	9—11
Efficient Turbocharger operation.....	12—13
S.S. Waratah.....	14-15
Bows.....	16-17
S.A. Navy (where are we now).....	18
Lucky Dragon.....	19
TOJ Crossword.....	23
News Snippets.....	24
Advertising.....	25
Marine Partners and International MoUs	26

Editor: Iain Armstrong

Email: saimena.toj@saimena.co.za

2022 2nd Edition

The opinions expressed in this Newsletter are those of the writers and not necessarily those of SAIMENA or this newsletter's editor . All submitted articles are subject to edit.

President's Report June 2022

Greetings to all SAIMENA members and associates reading this edition of our Two Oceans Journal, the second edition for 2022.

After the pause on in-person activities during 2020 and 2021 due to covid some Branch meetings and activities have started. The Durban Branch had a lunch late last year, and their AGM earlier in 2022, and the Cape Branch has now also followed with holding their AGM and Branch meeting in June (which was well attended. Some online activities, mainly CPD events, continued to be presented, which is great as it enable all SAIMENA members to participate in a single event. Let us hope that with the recent lifting of restrictions we can now resume normal Branch activities in a safe and congenial manner.

The SAIMENA National Annual General Meeting was held online in April 2022 and had reasonable participation. I was still disappointed at the relatively poor participation by most members, and would like to thank those who took the limited effort to join in the AGM. I was especially pleased that we were able to welcome a number of new members to Council, the first time in many years; and my thanks to the new Council members. I also want to express my gratitude to those members of Council who stepped down. It is good to be able to rotate the Council of SAIMENA. The new Council is reflected in this journal.

SAIMENA had 7 new members so far in 2022. SAIMENA was also able to award the first certificates for two new grades of membership, one Honorary Recognition to Ivan Parsons and one Marine Partner to the Club of Engineers. I request all members to review their changed circumstances and apply to revise their member grade where they can according to the SAIMENA Constitution (ie new qualifications, years of experience or professional registration). Unfortunately we had a number of our members passing away, and some resignations and had to suspend some members due to fees not being paid. We also suspended a student members because they had not kept contact with SAIMENA and we could not trace them. SAIMENA currently has 381 members of various grades of which 140 are registered with ECSA.

Please support your Branch committees as the current year continues, if you want SAIMENA to progress and influence the status of maritime affairs in South Africa then get active and voice your opinion by participation in your Branch Committee. We still have some SAIMENA members who are not in email contact with us, please encourage all your shipmates to ensure that they make electronic contact with SAIMENA to ensure that we can deliver on-time and relevant contact with our members, the use of the postal system is very expensive and highly unreliable. Many members also fail to update their details resulting in a breakdown of contact, please keep SAIMENA up to date so that we can be of service to you our members.

SAIMENA in co-operation with industry partners (Engineering News/International Zinc Association Africa and the CSIR program AISI) promoted a number of on line webinar events which would give attendees easy ECSA CPD points; not a bad way to get your annual CPD points for free! Inputs were made on behalf of SAIMENA to the various segments of the work being done on the new Oceans Economy Master Plan. The segments focused on were Shipbuilding and Repairs, Maritime Engineering and Design, Skills development and Technology and R&D. I still feel it is vital to make inputs to ensure that the marine industry can give feedback and lessons learnt from current affairs, especially as SAI-MENA was not formally involved in Operation Phakisa (although some individual members may have taken part). My thanks to those members who contributed comments for use in these discussions to ensure that an alternative and rational industry opinion was raised against the current institutional Operation Phakisa position and limited progress.

Following SAIMENA's renewal of our Co-Operation Agreement with the Royal Institution of Naval Architects (RINA) we had one member utilise the joining clause between SAIMENA and RINA, we wish him good luck with his activities.

I would like to review the Strategic Focus Areas we set for 2022

The development of Mentoring by our senior members for students and developing members in both the STCW and Professional Engineering areas has not really taken off yet this year. We hope for better progress as the year proceeds.

SAIMENA will continue with inputs in the education areas for engineering at the various universities as far as we can, through the respective advisory boards. With participation in the ECSA academic review of the NMU Marine Engineering course having been completed last year by ECSA, and the upcoming CPUT Industry Advisory Board due soon.

The Key Challenges Facing SAIMENA.

Getting students and junior members involved and getting them to accept an active role in the organisation.

Developing a greater understanding of maritime engineering at ECSA and getting experienced SAIMENA members to take an active role in the activities of ECSA in enhancing and growing maritime engineering in South Africa.

I have been disappointed in the low level of involvement of most SAIMENA members in the organisation via feedback, comment or opinions of the various messages sent out. This is a pity as with no feedback or involvement it means that the SAIMENA Council has no idea of the direction that members would like the Association to take in the years ahead. What do you want from SAIMENA ? please let us know.

Other Matters

I note that the first of the 3 x Inshore Patrol Vessels for the South African Navy has been delivered already and the work continues on the Hydrographic Survey Ship, especially as these are all being locally built by the South African industry with local people. The Survey vessel's hull seems largely completed with outfitting starting.

It would be great if the industry and Navy are willing share more information and progress reports on these new builds with the maritime community.

Active participation in public events (online or live) by SAIMENA members enables the opinions and experience of SAIMENA to be shared and through that we can enhance the status and professionalism of the maritime sector in South Africa.

Thank you for the support during the past year, and I look forward to enhanced levels of participation and interaction with SAIMENA members in the year ahead.

Best regards

Kevin Watson
President SAIMENA

**Accepted as HONORARY
RECOGNITION member**

Member No	Name	AuditDate
HR1976055	I.M. Parsons	20-May-22

Accepted as MARITIME PARTNER

Member No	Name	AuditDate
MP1- 2022M01	Club of Engineers Maritime and Mining Pty Ltd	05-Apr-22

Accepted as FELLOW

Member No	Name	AuditDate
F2022006	D.S. Gliddon	06-May-22

Accepted as ASSOCIATE

Member No	Name	AuditDate
A2022005	N. Davids	10-Apr-22
A2022004	R. Mutangi	17-Mar-22
A2022003	T. Moodley	17-Mar-22
A2022001	M.M. Smit	10-Feb-22
A2022002	G.R. Smit	10-Feb-22

Exempt section B 2.7.2

Member No	Name	AuditDate
F1975097	M.C. Lyness	13-Jan-22

Re-instated, fees paid

Member No	Name	AuditDate
F1985012	R.W. Holmes	07-Jun-22

Deceased

Member No	Name	AuditDate
F1975104	R.G. Stolze	23-May-22
M1977038	J.A.H. Leibrandt	09-Mar-22
M1996011	P.S. Geisler	06-Jan-22

Resigned

Member No	Name	AuditDate
A1979028	T.I. Morris	09-May-22
A2017012	C.S. de Jager	09-Mar-22
F1986013	L.R. Palmer	14-Feb-22
M2019007	D.P. Olds	11-Feb-22
A2008022	B.P. Dunn	09-Feb-22
A2006009	B.J. Fish	07-Feb-22

Suspended as No member reply

Member No	Name	AuditDate
S2013003	T. Chona Njumashoua	05-Jan-22

The Editors Desk



In the last edition of TOJ, I published an obituary to Philip Geisner who sadly passed away in January this year.

After asking for a pic of Philip without success, I got a picture of a Philip Geisner from the internet and two members were very quick to point out that the pic was not the Philip Geisner known to SAIMENA for which I humbly and unreservedly apologise.

My embarrassment was such that I immediately did another search of the internet and came up with another pic of a Philip Geisner who lives in KZN. Please note that I have never met, heard, or known of Philip during his lifetime.

The two members who pointed out the error of my ways, kindly also sent me pictures after publication which were purported to be Philip. So now I have 4 pictures all of which purported to be the late Philip Geisner, of which one, some, or none of them are correct.



1



2



3



4

If pic 1 and 4 had the same hairstyle they could be of the same person albeit a difference in age. Also pic 2 and 3 could be the same person. Whatever the case I simply don't know. As an example, many of you will know of Richard Armstrong who is a ship surveyor in Cape Town and is no relation to me at all, but he shares the same name as my brother who also lives in Cape Town. If you had no idea of what Richard Armstrong looks like, how would you know by a photo which one is which?

This shows the difficulties in editing a publication in that you can only go on the information received.

I edited Shipyear for 10 years and now TOJ for several years, so I have some experience in these matters, and sometimes you get it wrong no matter how hard you try. It has been suggested that every member should submit a selfie to SAIMENA to place in a data base so that when the need arises we have a photo of the member concerned.

Yes please, it makes my job a lot easier.

At time of writing the war in Ukraine is savagely being conducted and I cannot help but feel that mankind just refuses to take note from history. Perhaps it's due to some of us disliking history as a school subject during our youth. After all what's the point of learning about stuff that happened long ago.

From Genghis Khan, to Napoleon and Hitler plus many others, there is always some lunatic who thinks destroying things and killing people is a good thing to prove how manly they are. There is nothing macho in using force on a peaceful people or any individual to achieve dominance. We used to call them bullies and they are despised.

Most of the world has learnt this but there is always one who didn't do his homework.

The similarities between events leading up to the WW2 and the Ukrainian "limited military engagement" are striking in their familiarity with the main difference being the world now has nuclear weapons. When will we ever learn?

SAIMENA CERIFICATES HANDOVER

SAIMENA approved the creation of two new grades of membership at the AGM of 2022:

Honorary Recognition, and

Marine Partner.

SAIMENA had the opportunity to handover the first membership certificate for Marine Partner at the recent Cape Branch AGM on 9 June 2022.

The first Marine Partner membership was granted to the Club of Engineers, who was represented by Eng Gijsbert Bakker (rhs), seen below receiving the certificate from the President of SAIMENA (lhs).



A membership certificate was also handed over to Fellow David Gliddon PrEng (centre) at the same occasion.

The first Honorary Recognition certificate has also been awarded to SAIMENA Associate Ivan Parsons for service to SAIMENA and the local Durban Branch for many years with great dedication and have made enormous contributions to the efficient running of SAIMENA in his capacity as Honorary Treasurer from 2008 to 2016.

OBITUARY



It is with regret that I have to announce the passing of John Leibbrandt who left us on 1st November 2021.

John was a loyal and long standing member since 1977 and will be missed by all.

Our condolences go out to John's family

TREVOR FORBES FAREWELL.

A farewell for Trevor Forbes was held at Grimaldis at the Durban Country Club in May as he is leaving for Australia. I don't know if Trevor is retiring down under or perhaps visiting family or maybe both.

Trevor has been a great supporter of SAIMENA for many years being one of the very early members since the Institutes inception

Trevor spent all his sea career at Safmarine and many years in the office, finishing off as head of the technical team.

15 Chief Engineers attended of which 11 are ex Safmarine Chief Engineers

We wish Trevor all the best. He will be missed and ask of him to please keep in touch with us at the Institute



Lhs: Charley Hicken, Ian Lloyd Jerry Rabie, Bob Twelves, Phillip Wood, Henry Hugo, Trevor Burnett, Willem Deyzel

Rhs: Garry Crabtree, Mike van der Heever, Al Berger, Alistair Mackenzie, Trevor Forbes, Louis Gontier, Dave Fiddler



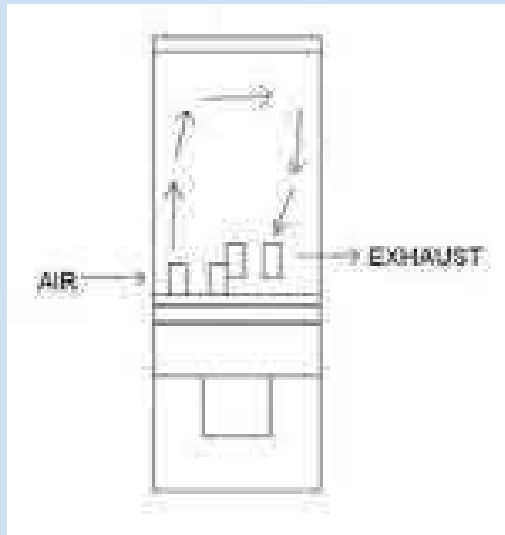
12 May 2022

Engine Scavenging

The process of admitting air and expelling exhaust gas is known as scavenging. The three main types of scavenging for two stroke engines are cross flow, uniflow and loop flow.

Cross Flow

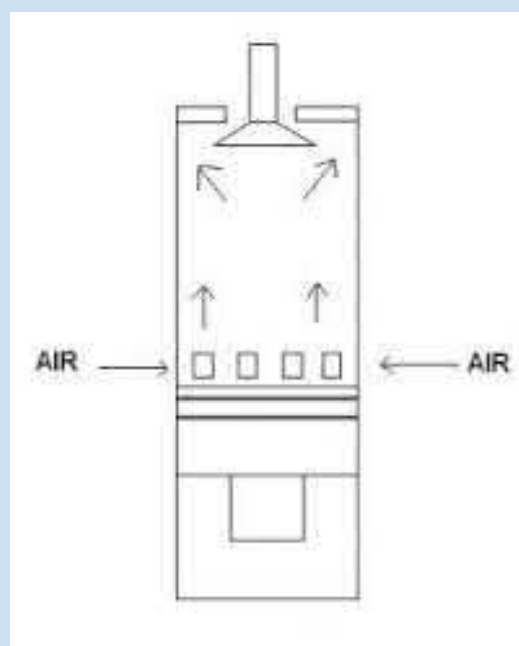
Cross Flow Scavenging is the gas exchange process in which the charge air passes is directed upwards, passing under the cylinder cover and down the opposite side, expelling exhaust gas through exhaust ports on that side.



Uniflow

Increase power output. Most efficient of all three methods. Good scavenging at all speed ranges and throttle position. Low fuel consumption compared to other scavenging types.

Uniflow scavenging is a design in which the fresh intake charge and exhaust gases flow in the same direction. This requires that the intake and exhaust ports be at opposite ends of the cylinder.



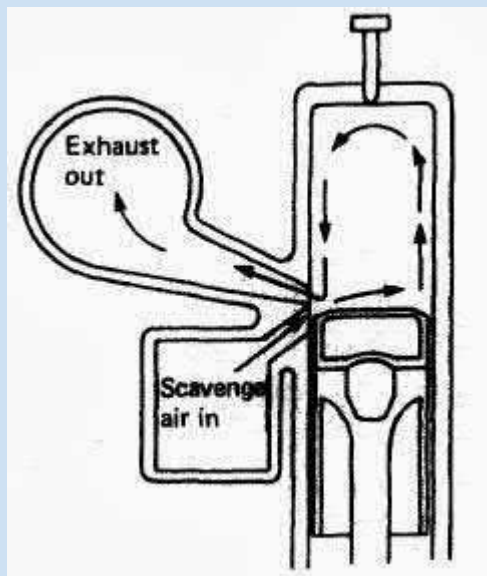
Vertical Loop Flow (or reverse scavenging).

In this scavenging method, the intake port and exhaust ports are located at the same side in the engine.

In this method, the size of the intake port is a large size to enter a large volume of charge inside the cylinder, and the size of the exhaust port is small (increases velocity) to flow out burnt gases quickly.

When the fresh charge enters from the intake port, the fresh charge has a swirling motion (as like a loop) hence this fresh charge moves upwards and pushes back the burnt gases. Hence in such a way, these burnt gases flows out of the cylinder.

This method of scavenging performs well during the high speed of the engine or at full throttle time while bad scavenging obtains at the low speed of the engine.



What is scavenging?

Understanding scavenging requires us to understand why we need scavenging in the first place. We knew that an adequate amount of oxygen is required to start and sustain any combustion. Now since air contains 21% of oxygen; something engine needs in large amounts to burn fuels. Oxygen in the form of fresh air is taken into the combustion chamber to support the combustion process. This method of taking in fresh air while releasing exhaust gas is known as scavenging.

The scavenging process is one of the key factors determining the overall power of the engine; as the poor scavenging process leads to poor combustion. Such poor combustion due to mixing of fresh air with exhaust not just leads to power loss; but adversely affects the engine due to poor running conditions.

The process of injecting fresh air to assist the displacement of exhaust gas; out of the combustion chamber is known as scavenging.

For an efficient scavenge process, we need proper exhaust; with exhaust valves/port opening before that of scavenge ports/inlet valves. To reduce the loss of fresh air through exhaust outlet; the scavenge port/valve be closed after that of the exhaust valve.

Loop Method

Advantage

1. Reduced Heat Loss Due to Small Volume of Cylinder
2. No effect of load on Scavenging Efficiency
3. Low Maintenance
4. Less Number of Moving parts
5. No Need of Complex Cooling System
6. Does Not Require two or More Fuel Injectors To be installed

Disadvantage

1. Short Scavenge time
2. Poor Scavenging at top corners of the Cylinder
3. Expensive liner Due to Complicated liner Design
4. High thermal Stress Around Ports due to temperature difference.
5. Need improved Cylinder Lubrication System

Uniflow Method

Advantage

1. High stroke to Bore Ratio
2. Increased Power Output
3. Simple Liner design
4. Low cost Of Liner
5. Reduced Lube Oil Consumption
6. Increased Scavenge Efficiency
7. Low Fuel Oil Consumption

Disadvantage

1. Require Complex Cooling Arrangement
2. Is Costly
3. Requires More maintenance
4. .Requires two or more fuel oil to be fitted
5. Can not be used with very small engines

Cross Flow Method

Advantage

- 1 Low cost
2. Can be used for any size of engine
3. Unaffected by Load in Engine
4. Simple cooling Arrangement
5. No need Of exhaust Valve
6. Robust and Need less maintenance

Disadvantage

1. Tendency to Knock
2. Increased Piston ring leakage due to Uneven wear
3. Complex liner Design
4. .High Lube oil Demand
5. Inefficient Scavenge Method
- 6 High Risk of Exhaust Gas mixing with Fresh Air

Acknowledgements: Shipfever

Efficient Turbocharger Operation On Ships

The turbocharger is an integral part of the ship's marine engine as it reuses the exhaust gases in order to increase the overall efficiency of the engine. It consists of two parts – blower and turbine sides, which need equal attention while carrying out routine maintenance procedures.

As a marine engineer working on ships, you would be required to monitor the performance of turbochargers during the watch and carry out maintenance whenever required.

Mentioned below are ten points that must be considered while handling turbochargers in the ship's engine room.



1. Keep a Close Watch on All Turbo Charger Parameters: This is obvious, but watch-keeping officers often forget to check important parameters while taking rounds or overlook them in haste. While monitoring the turbocharger, the following points must be checked:

- Speed of the turbocharger
- Exhaust gas inlet and outlet temperatures
- Cooling water inlet and outlet temperatures
- Turbocharger lube oil pressure and temperature
- Differential air pressure in manometer at the compressor side

2. Keep a Track On the Sound of Turbo Charger– Sound is one of the best ways to identify any machinery problem. Any kind of abnormal scratching sound indicates a problem in the rotating parts of the turbocharger. Moreover, the howling sound indicates a choked inlet or air passage, which leads to **surging of the turbocharger**.

3. Check Vibration: Turbochargers are high speed rotating machines. In fact, some of them achieve speed higher than any other machinery onboard ship. Hence, they have a natural vibration frequency. Engine bracing is done near the turbocharger to transfer such vibrations to the ship's structure. If the vibration increases abnormally, stop the engine as it may be due to worn out bearings, abnormal "K" value or loose foundation bolts.

4. Check For Exhaust Leakage: Turbocharge handles extremely high-temperature gases. The inlet is from the engine and the outlet connects exhaust pipes to the funnel. These two points are flange-connected with a distance piece in between. It is important to ensure that there is no exhaust leakage from these joints as it may lead to fire or a smoky atmosphere inside the engine room.

5. Check leakage of Sump Oil: In turbochargers with separate oil sumps, keep constant checks on the oil level and temperature. In some ships, it has been reported that, due to leakage in the turbine side casing, the oil comes in contact in hot spots on the engine body and with the exhaust gas. Such incidents have lead to a fire in the engine room.

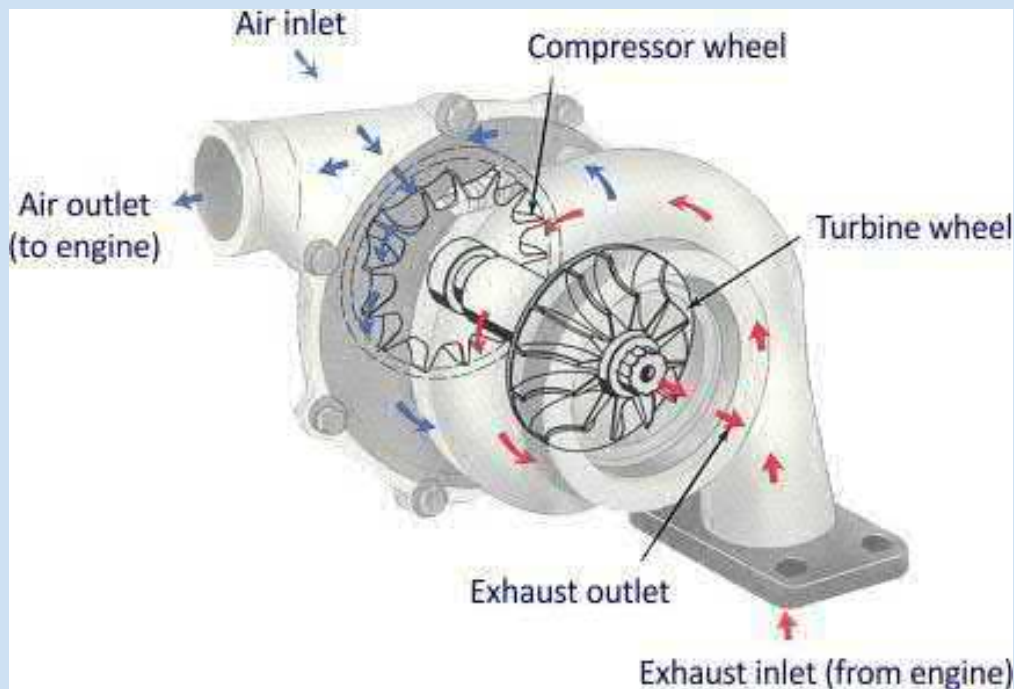
6. Intake Filters: Marine turbochargers come with mesh filters to avoid any particles, moist oily air mixture etc. from going inside and fouling/damaging the compressor turbine. It is recommended to put an extra felt filter over the turbocharger compressor to absorb oily air mixture as such filters can be changed frequently. The fitted mesh filter must be chemically cleaned bi-monthly or as per the running hours described by the manual.

7. Turbocharger Washing: The Turbocharger turbine and compressor sides must be cleaned regularly as per the maker's recommendations. The cleaning of the turbine and blower sides is carried out to remove carbon, soot, and other exhaust deposits.

8. Soot Blow: The turbocharger performance will get affected if the exhaust passage after the turbocharger is in foul condition (exhaust trunk and economizer). It may lead to surging or even breakage of turbine blades. Therefore it is recommended to soot blow the exhaust gas boiler tubes on daily basis.

9. Power Distribution: The turbocharger is driven by the exhaust gases produced by the combustion process inside the engine cylinders. As the engine comprises multiple cylinders, it is important that there is a power balance among all the cylinders. If one cylinder is producing more power due to malfunctioning of fuel valve, it will lead to surging of turbocharger's turbine side. Proper care must be taken to ensure even power distribution in the ship's engine.

10. Check Clearances: When the turbocharger is opened up for overhauling, all-important clearances like casing and blade tip clearances, "K" value of the shaft, which determine the correct alignment of the shaft, and proper operation of the labyrinth seal which is fitted between the impeller and exhaust shield must be taken.



Acknowledgements: Marine Insight

The Disappearance of the S.S. Waratah

On 26 July 1909, the SS Waratah, with 211 passengers and crew departed from Durban bound for Cape Town, and disappeared without a trace. For 90 years the fate of the ill-fated ship remained a mystery. The SS Waratah was the flagship of the Blue Anchor Line shipping company. On the 14 July, marine explorer, Emlyn Brown, announced he had discovered the location of the wreck off the Eastern Cape coast. This was the culmination of an 18 year long search for him. The wreck was found in an upright position, resting on the ocean bed, indicating that it had sunk quite rapidly. Brown declined to share the exact location of the wreck, as this would tempt unscrupulous and amateur explorers to plunder the wreck. Further, the wreck was located at a position surrounded by strong currents and at a depth that made conventional diving techniques and equipment unsuitable. It is speculated that the ship was sunk by a freak wave.

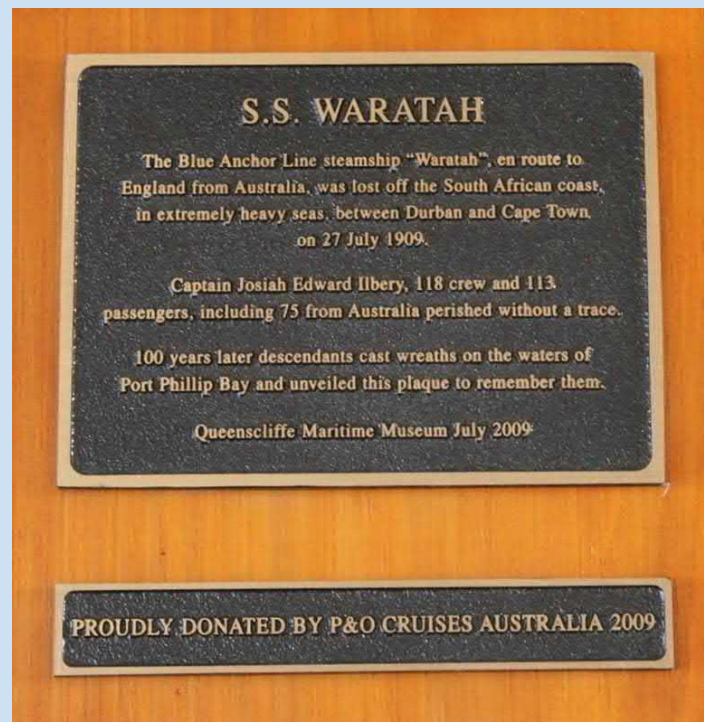


She was designed to serve as a passenger and cargo liner to Australia and was launched on 12 September 1908 by Mrs. J. W. Taverner, wife of the Agent-General of Victoria. Weighing almost 10,000 tons, this 500-foot steamer ship disappeared in July 1909, on her return voyage from Australia via Cape Town. There were no survivors; all 211 passengers plus the crew went down with her in the Indian ocean. Some people have theorized the ship could have been struck by a massive freak wave, was unable to recover and capsized



Captain Joshua libery

Some ideas for this tragedy include everything from an explosion in the heating system of the ship, inability to control her in the strong current to turbulent weather that left her floating directionless. Any of these could have caused her to eventually drift from the Southern African Shoreline into the Antarctic Circle. The liner had enough provisions on board to last a full year.



Bows

The foremost part of the ship is part aesthetics and part science. Your ship travels in a medium that provides considerable drag as compared to air.

Now, this requires the design to be such that the components of ship resistance are kept less. Especially, in the case of ships with fuller forms, components of Wave Breaking Resistance become significant, while ships with a slender and a more curved form have less Wave Making Resistance.

Fortunately, these can be controlled by how the water and waves interact with the ship at entry at the fore-end. The ship bow is where the fore part of the ship first comes in contact with the water as far as your design waterline is considered. Looking at the different Ship Bow Designs in existence today, it seems that most of the shapes possible and a combination of two or more of them have been tried out.

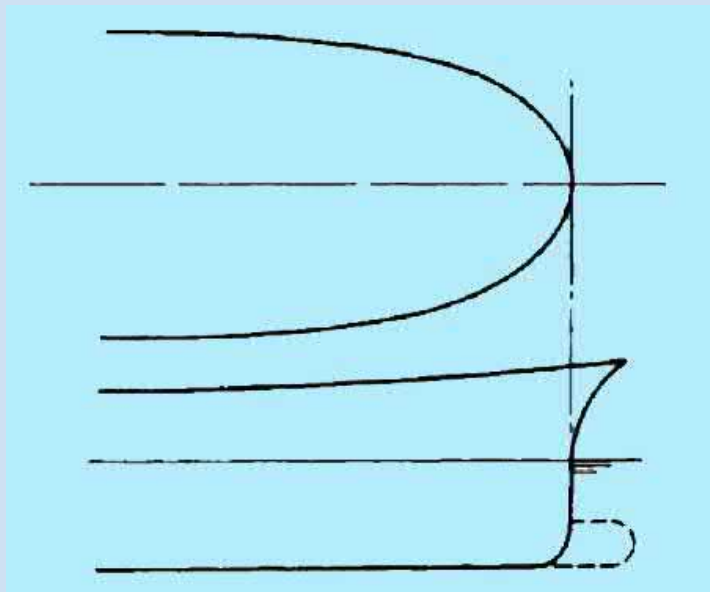
However, newer designs have emerged and older lesser-used designs have often been tried out with certain changes after extensive analysis.

Parabolic and Cylindrical Bows

Designers may consider designing vessels with 'blunt' stems as opposed to the sharp nature of the bow section. Here is the Parabolic Bow, which resembles the mathematical curve, the *Parabola*.

Only designing a parabolic shape for a ship hull is not enough, you have to see the flow around the hull and for this, give it a typical rounded form like a normal round bilged hull.

Parabolic Bows may be combined with Bulbs to take the Wave Breaking Resistance into account as these are popular in fuller form designs and are being used in Bulk Carriers today.



The closest cousin to these is the cylindrical ship bows which are also designed for fuller forms at design waterlines and are ideal for use in fully loaded conditions.

The Cylindrical Bows can have minimal Wave Making Resistance if designed with proper attention to the bluntness of form and stem edge at different drafts.

The Axe Bow

This design usually has a vertical stem line coupled with a long, deep and narrow fore portion of the hull, somewhat like an axe.

This shape allows it to cut through the water, allowing it to pass easily through waves with less pitching as opposed to a normal bow.

The lower portion of the fore-end of the hull, called the forefoot rarely emerges out of the water and hence the vessel is less susceptible to slamming also.



X-Bow: The Generation of Inverted Bows

This is a design where your ship's bow and almost a greater part of the hull appears upside down in comparison to a normal round bilge hull or any of the hull shapes you generally see on ships? The inverted bow is a success story among the revival of technologies that became obsolete in a different era.

These hull forms have the advantage of allowing maximum length waterline for ships of comparable sizes which means the highest possible *hull speeds*.

Like the Axe Bow, these bows have less spray of water at entry and also have less pitching motions and slamming reduction is quite significant. This creates quite a comfortable experience for the crew.

The fuel consumption is also reduced by a significant factor and this bow can operate quite efficiently in medium-sized wave ranges mainly because of the larger part of the ship volume being above and upfront, directly impacted upon by the waves.



Acknowledgements: Marine Insight

The South African Navy (where are we now)?

According to sources the Navy has not been funded sufficiently to carry out planned refits . Only one of the four frigates the navy has was refitted in the 2014/2015 period and only one of the three submarine during the 2013/2014 period

Funding for the planned refits of the remaining three frigates and two submarine was not available.

The sole submarine refit is ongoing with a target completion date being the 2023/2024 financial year.

Due to the refits not being carried out on the outstanding craft, emphasis is being placed on maintenance and repair.



As of June this year the total number of naval vessels in the SAN consists of four frigates, three submarines, thirty one patrol vessels, and two mine warfare vessels.

Acknowledgements: GP Strength in numbers

Kevin Watson comment- Actual Naval current strength is as follows (July 2022):

4 x Valour Class frigates (MEKO® A200 – SAN) (FSG)
3 x 209 Class submarines (Type 1400MOD (SA)) (SSK)
1 x Fleet Replenishment ship (AOR) SAS DRAKENSBERG
1 x Survey Ship SAS PROTEA
2 x Warrior (Ex Minister) Class (Fast Attack Missile) (FAC (M)) now OPV
2 x River Class (Coastal Minehunters) (MHC)
21 x Namacurra Class (Harbour Patrol boats) (HPB)
Various small craft
5 x Coastal & Harbour tugs
4 x Westland Super Lynx helicopter operated by SAAF

New

1 x Warrior-class inshore patrol vessel (IPV), 2 more on order
1 x Survey ship on order

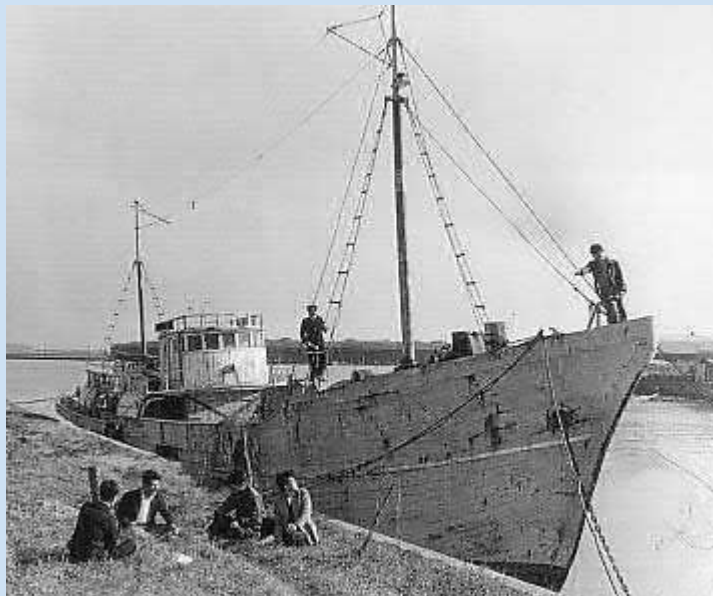
KJW



The Lucky Dragon

Near the Bikini Atoll on March 1, 1954, the fishing vessel "Lucky Dragon" was plying its trade with a crew of 23 men. There is nothing significant about that except that they had lost most of their nets earlier and consequently altered their course to go towards the Marshall Islands.

Also on March 1st 1954 the American military tested a thermonuclear bomb code named "Castle Bravo" and the US navy had issued some months previously a map of the "danger area" where it was considered unsafe to enter, although the exact position of the Lucky Dragon on the day of the explosion is uncertain, contemporary references give a figure of "80 miles (130 km) east of Bikini Atoll". The explosion however was far more powerful than predicted and the ship found itself unknowingly within the fallout area.



The result of these circumstances was that the Lucky Dragon while not being damaged by the shock wave from the blast. Suffered, several hours later, of a white, radioactive dust made up of radioactive particles of coral and sand falling on the ship. The fishermen attempted to escape from the area, but they took almost 6 hours to retrieve fishing gear from the sea and process fish (mainly shark and tuna) caught on the lines, exposing themselves to the radioactive fallout.^[9] The fishermen scooped the highly radioactive dust into bags with their bare hands. One fisherman, reported that he "took a lick" of the dust that fell on his ship.

During their return, the crew began showing symptoms of radiation poisoning as early as the evening after exposure. They experienced pain, headaches, nausea, dizziness, and diarrhea. Their eyes began to turn red and developed an itchy mucus. One crewman decided to keep some of the ash in order to have it analysed on their arrival home, but it was kept in a pouch hung from one of the bunks and was therefore in close proximity to the sleeping men for the duration of their return. Later analysis of the sample by, among others, Tokyo University, determined that the ash was caused by a hydrogen bomb. The announcement of this news came as a large surprise to the Americans as they had persistently kept their nuclear experimentation secret. Consequent denials and an uncaring attitude by officials led to a public outcry against the government's handling of the Lucky Dragon, its crew, and the lack of information about fallout kindled an anti-nuclear and anti-American movement which gave impetus to municipal, prefecture and national assemblies passing resolutions in support of limiting or banning nuclear testing.

Acknowledgements Iain Armstrong

LNG pumps: key considerations

As the pressures rises for the abolition of the use of oil fuels to propel ships gains more and more momentum I see a time when the use of LNG will be the way to go and marine engineers will need to know about LNG pumps. It is with this in mind that the following article would I thought be useful to our members. The Editor

In the oil and gas industry, specialised pumps play a range of critical roles throughout the process of converting gas into LNG, storing it, and loading and unloading LNG tankers. Pumps that handle LNG are specialised and specified for the unique requirements of these applications, which require operation under cryogenic conditions, submersion of the pump unit, very high reliability and more. In this article, we take a closer look at some of the key requirements and considerations for LNG pumps.

To safely, efficiently and economically transport natural gas long distances, it is converted to liquified natural gas (LNG), which reduces it to around 1/600th of its original volume. Keeping LNG in its liquid form requires cryogenic conditions of at least -162°C to be maintained throughout the transportation process.

The pumps that transport LNG, such as those that move it into, around, and out of the storage tanks on LNG tankers, must therefore operate at cryogenic temperatures. Due to the significant safety and economic consequences should equipment fail or leak LNG, the pumps used must be highly reliable, durable and constructed of compatible materials.

For LNG applications, specialised submerged motor-driven cryogenic pumps are used. Some of the benefits of submerged operation include that, as a cryogenic fluid, LNG is an excellent electrical insulator, and the motor is completely isolated from oxygen in the atmosphere, eliminating the risk of fire or explosion.

This design also removes the need for rotating seals, which can be problematic and introduce a potential point of failure. Submerged LNG pumps are constructed as a single unit, with the pump mounted on the same shaft as the motor, to be submerged in the LNG.

Some of the cryogenic LNG fluid moves through the gap between the pump's rotor and stator to cool the motor. There are three main types used – fixed, vessel-mounted and retractable

Considerations for LNG pumps

Cryogenic LNG pumps incorporate unique features to meet the requirements of their specialised application. Some of the important requirements and considerations for pumping LNG include:

- Basic type – fixed, retractable, or vessel-mounted
 - Construction materials
 - Cooldown and warmup considerations
 - Hydraulic considerations (e.g. operation at low NPSH)
 - Handling considerations for pump size and weight
 - Thrust equalising
 - Bearing configuration
 - Junction box assembly and electrical penetrations
 - Vibration monitoring
 - Adequate testing at the cryogenic temperatures and the power levels expected in service

Due to the contact between the submerged pump and the LNG, and the cryogenic application temperatures, LNG pumps (and associated equipment like valves) must be made of suitable materials for these conditions. The materials must adhere to applicable regulatory and industry standards to ensure safety.

Housings and rotating elements, such as impellers and inducers, are often fabricated from cast aluminium alloys, such as ASTM A356-T6, providing excellent thermal conductivity, stability and ductility at low temperatures, with a light weight (an important consideration for handling and on ships).

Austenitic stainless steel and wrought aluminium are also sometimes used for casings and other fixtures. Impellers are hard-coat anodised to provide erosion resistance. Shafts are frequently made from appropriate grades of stainless steel, chosen for ductility and strength at cryogenic temperatures, as well as electrical properties, as the motor rotor is installed directly on the shaft shared by the pump and motor.

Bronze is often used for wear rings and bushings, due to its thermal characteristics in the required temperatures. Other bushings options include graphite and sintered bronze materials. The bearings that support the rotor assembly are typically made of 440C steel (a martensitic high carbon 400 series stainless steel), providing corrosion resistance and temperature stability.

The electric pump motor and rotor are usually made from silicon steel laminated plates. The strength, light weight, and heat-transfer properties of this material are well suited to cryogenic applications.

Cooldown and warmup considerations

Before LNG can be taken on, the LNG tanks, lines and pumps must be pre-cooled to prevent stress on their materials from overly rapid cooling, or LNG converting to gas form. Likewise, LNG tank warmup is an important part of the process for removing gas prior to dry docking or when tanks must be prepared for inspection. The cooldown and start-up, as well as warmup, processes of the application should be considered in pump specification.

Handling considerations for pump size and weight

Pump size and weight have significant implications for ease of installation and maintenance, and pumps contribute to the total load on LNG tankers.

Bearing configuration

Due to the poor lubricating qualities of cryogenic fluids, LNG pumps use specialised durable rolling-element bearings that can tolerate thrust in either direction and handle load reversals. Pumps associated with variable frequency drives (VFDs) may have ceramic ball bearings to prevent arcing due to eddy currents.

Junction box assembly and electrical penetrations

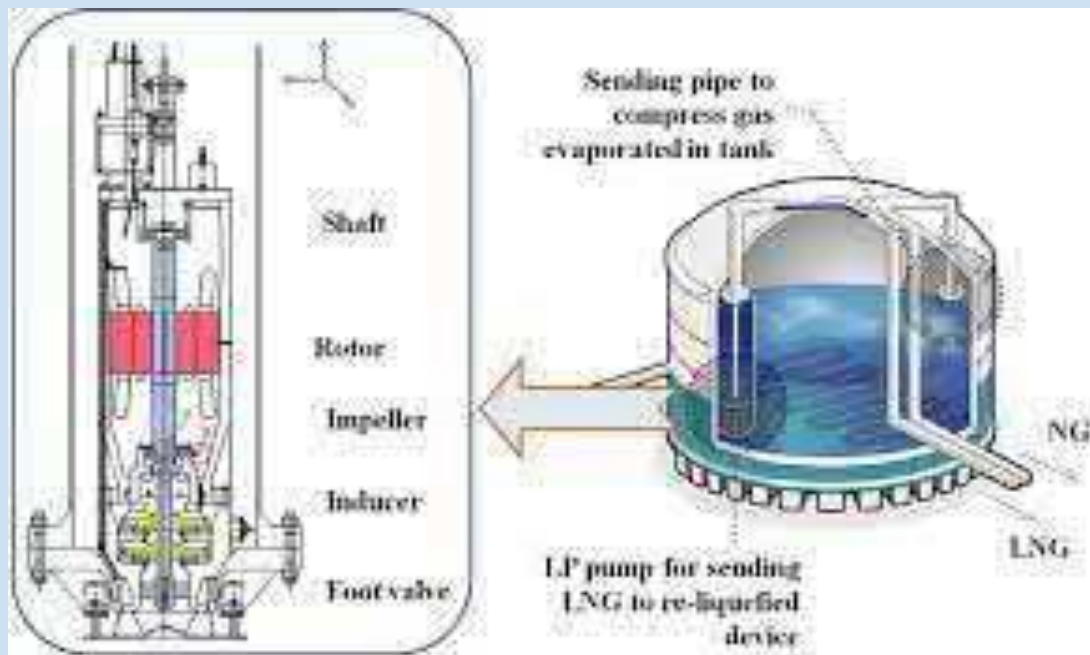
Electricity is connected to the submerged pumps through specialised junction boxes. As a penetration point between the LNG within the tank and the external atmosphere, the junction box and the electrical feed-through assemblies must be composed of appropriate materials and the design should incorporate various redundancies to prevent gas leakage to ensure safety.

Vibration monitoring

Vibration monitoring systems alert operators to potential cavitation and operation outside set parameters, which could indicate the presence of vapour, meaning LNG is converting to natural gas.

Testing cryogenic LNG pumps

As a result of the unique design of LNG pumps and the operating temperatures required, they cannot be tested using water, and must be tested with LNG to verify performance as close to the conditions of actual use as possible. Testing with LNG close to design conditions verifies:



Testing cryogenic LNG pumps

As a result of the unique design of LNG pumps and the operating temperatures required, they cannot be tested using water, and must be tested with LNG to verify performance as close to the conditions of actual use as possible. Testing with LNG close to design conditions verifies:

- **Motor performance and starting ability in cryogenic liquid**
 - Mechanical alignment
 - Pump performance characteristics using the cold boiling liquid, vital for NPSH testing
 - No internal leakage due to deformation or differential shrinkage when the components are stressed at actual operating conditions



Acknowledgements: Michelle Goldsmith

TOJ Crossword

Emerald Isle

ACROSS

1. IUD piece
5. Let in or let on
10. Cul-de- _____
14. Aries or Taurus, e.g.
15. Cautiously examine the contents of
16. Airline to Ben-Gurion
17. Walk wearily
18. Proper attitude for Freddy Mercury or Elvis?
19. Lofty prefix
20. Blade for a British fencer
22. Knit's inverse
23. Infamous McCarthy aide Roy
24. Mountain by Banff
26. Providing with energy
27. Steam-powered car eponym
29. They'll show you the world

31. Gives up the wheel?
32. Taj _____
33. Supporter's syllable
34. Field of medicine not regulated by the AMA
36. View finder?
39. Slow, on a score
40. Love Potion #9, e.g.
42. Removes (oneself)
45. Tuna fisher's technique
46. Creepy feeling
47. Clam's relative
48. PFC's banes
49. "Good grief!"
51. Bald tire's lack
54. _____ buco: veal meal
55. Go on the fritz
57. Capital of Italia
58. One of the "little people"
59. Places for power plays

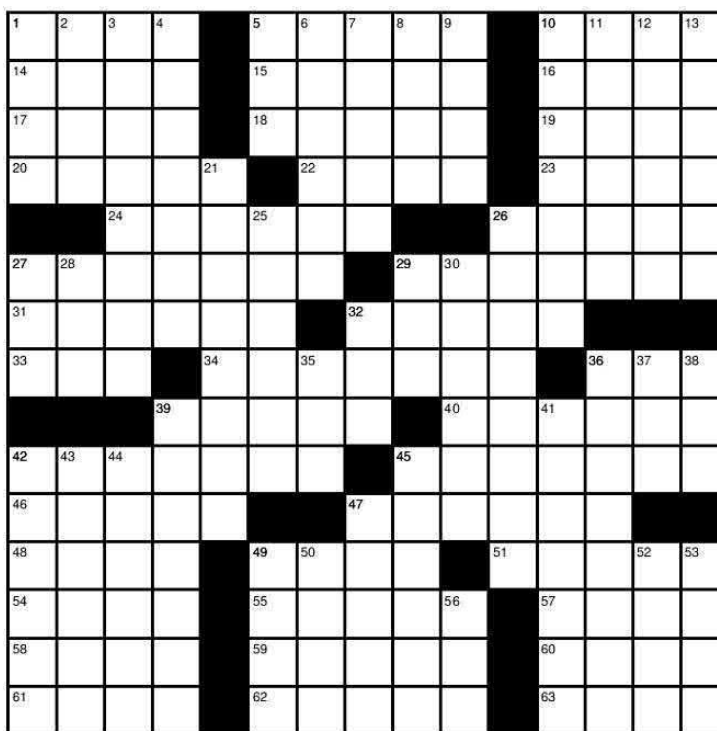
60. "The Wonderful Wizard _____"
61. Without
62. Kosher
63. Send through a secondary wash cycle

DOWN

1. ZIP code org.
2. Ms. Tequila of "A Shot at Love"
3. Phrase often associated with Saint Patrick's day
4. Gridiron stratagems
5. Taxing mo. for many
6. With intensity
7. Popular pie topping
8. _____-Tass
9. It puts the "turn" in pike
10. Beach-comber's fuel source

11. Lets
12. I, V, or VI for Henry VIII
13. Weapons for David
21. Animates
25. Part of a ratchet mechanism
26. Item on an iPod
27. Design for pro pics
28. Word with yellow, rose, or Texas
29. Towers, at times (abbr.)
30. What bad things may come in
32. Wool source
35. Some sporty Audis
36. Classic Irish ballad featuring the phrase in 3 down
37. Dark half of a Chinese symbol

38. Wee bit of work
39. Things to learn
41. Mistaken
42. "_____ Fables"
43. Small obstacle between Sarah Palin and Russia
44. Lays atop
45. Japanese motorcycle maker
47. Processing, as some mail
49. Borden of evaporated milk fame
50. "_____ Homo" (Bosch painting)
52. "The Beekeeper" performer Tori
53. Post-knockout state, perhaps
56. Hours for a WA winter



© 2009

News Snippets

1. The developer of the world's first zero-emission hydrogen-powered autonomous ship has received approval in principle for its systems in the same month that the Mayflower autonomous surface ship (MASS) just about made it across the Atlantic.
2. According to the International Chamber of Shipping (ICS) and the International Maritime Organization (IMO), the global merchant fleet is responsible for about 3% of global carbon dioxide emissions, equivalent to the annual emissions of a major developed country like Germany.
3. Oceanwings is a beyond state-of-the-art rigid wing sail technology that solves the environmental and economic dilemma faced by shipowners: reducing their environmental footprint while remaining profitable. The Oceanwings enables up to 45% savings in vessels' fuel consumption .
4. A toxic cloud of chlorine gas was released in a loading accident on the afternoon of 27 June in the Jordanian port of Aqaba on the Red Sea.
5. Melting ice in the Arctic Ocean could yield new trade routes in international waters, reducing the shipping industry's carbon footprint
6. A New York state regulator on Friday fined cruise line operator Carnival Corp \$5 million for "significant" cybersecurity violations, following four security breaches from 2019 to 2021 that exposed substantial amounts of sensitive customer data.
7. Chinese shipbuilders have handed over the 24,000 TEU capacity Ever Alot to Taiwanese shipping company Evergreen Marine.
8. The first vessel delivered to the partnership of Stena Bulk and methane producer Proman is the 49,990 dwt Stena Pro Patria, first in a series of six dual-fuel MR tankers under construction
9. There was a four-fold increase in the number of containers lost overboard during the 2020 – 2021 compared to the previous two-year.
10. Analysis by the Maritime Oslofjord Alliance reveals that only about 15% of existing tankers, bulkers and container ships are equipped with electronically controlled main engines, making them potentially suitable for conversion to alternative fuels.
11. MSC is launching a campaign to reach net zero CO2 emissions by 2050 "Journey to Net Zero" and has announced it has adopted sustainable biofuel as a transition fuel in its ocean operations.
12. A surge in demand is being seen for scrubber retrofits as the price spread between high and very low sulphur fuel oil exceeds \$400 per tonne.

Advertising

The “Two Oceans Journal” is quite happy to advertise your company in its content at a fee of R500 per full page.

Any advertisement will accommodate your wording and any pictures or pictures you would wish to include. In fact you can compose your advert exactly how you want it to be and send it to me for inclusion preferably in word or any other format that I can copy and paste. If you would like me to design it, just give me an idea of what you would like it to be and I will submit a proposal at no cost to you.

All fees will go towards SAIMNA’S account held by the treasurer and will be used only to help cover the costs of running the Institute and projecting SAIMENA’s aims and objectives.

Thank you

The Editor.

Marine Partners and International MoUs

Marine Partners

Club of Engineers

International MoU

_Royal Institute of Naval Architects (RINA)

The Institute of Marine Engineers (IMarEst)

Engineering Council of South Africa registrations:

ECSA CPD Service Provider Number: SP_025/2025

ECSA CPD Licensing Body Number: LB_027/2023

