The South African Institute of Marine Engineers and Naval Architects

SAIMENA

The Two Oceans Journal

2nd Edition 2021

National Council 2021/2022

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2021 2nd Edition

www.saimena.co.za

President's report

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This past year of 2021 has been very difficult and disruptive for us all. With no live meetings taking place and we are becoming accustomed to virtual events becoming the new norm.

The SAIMENA National AGM for 2021 was thus convened online due to COVID, after having postponed the AGM for 2020. The AGM was successful, although the dearth of new members volunteering to step up to assist on Council was disappointing. The SAIMENA Constitution has now also been updated with changes as approved at the AGM and will be distributed to all members shortly.

SAIMENA membership growth this year has (understandably) been very slow, but we have had 5 new members this year so far. I encourage all members to actively solicit new members, especially the younger generation, students/cadets and this who are currently not as active in our marine association, especially people of colour who are significantly missing from the structures of council and branch committees. I believe growing our numbers in these areas is vital to enable SAIMENA to play a more meaningful role in the maritime space in the future.

The support from Council and the Branch Committees has been essential to ensuring that SAIMENA is robust and able to continue playing its role in the marine sphere, especially during these constrained times. All SAIMENA members are again requested to please get involved at a branch and council level, more participation means a lighter work load on committee members and makes it more pleasant for all involved, it also gives you a chance to have your say and ensure that service and support you want from SAIMENA is achieved, get involved as only you can make a difference, don't sit on the side-lines.

Upgrades of the SAIMENA website is on-going, please consult the website and feel free to forward any constructive suggestions you may have so that we can enhance the communication with our members via this means.

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.

ECSA has recently engaged SAIMENA to help our maritime qualified members who are registered at ECSA, to register to become discipline specific assessors in all our geographic locations. Presently there are no Marine related assessors on the ECSA database, which means that our Marine related disciplines are not effectively or fairly evaluated when members apply for registration. Please make yourselves available for assessor training so that we can strengthen our marine representation and ensure that the standard of marine engineering is maintained at a level that we as SAIMENA will be happy with.

I am pleased to note the positive progress in the new ship construction projects launched for the South African Navy, to provide 3 x Inshore Patrol Vessels and one Hydrographic Survey Ship, especially as these are all being locally built by the South African industry with local people.

The continued demise of ship repair companies in the face of regional competition and limited national support is also very detrimental to our marine industry.

I would like to confirm the Strategic Focus Areas For 2021

Development of Mentoring by our senior members for students and developing members in both the STCW and Professional Engineering areas.

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.

SAIMENA also looks to provide enhanced support to ECSA for the registration and accreditation of engineering professionals, including ongoing support for CPD courses and training; and also to get ECSA to hopefully recognise Maritime Engineering as a discipline of its own within South Africa which will assist with the Ops Phakisa initiatives I believe.

Growing student and junior member numbers to join SAIMENA and become active participants in SAIMENA affairs.

The Key Challenges Facing SAIMENA.

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

Reluctance of members to take a leadership and directing role in the affairs of the institute, I think most voluntary organisations end up relying on a small pool of active members to run the organisations.

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

SAIMENA Key Projects, Initiatives and Possible Areas for Collaboration.

SAIMENA course of "Mentoring in a Maritime Environment" including the ECSA course for training Assessors.

SAIMENA has re-confirmed our relationship with similar international bodies such as the Royal Institution of Naval Architects (RINA), Institute of Marine Engineers (IMarEst).

Working with SAIMI on creating a post-graduate course for Marine Engineering and Naval Architecture to be presented in South Arica; as the availability of academically qualified and experienced people in these fields remains a critical problem in many institutions in South Africa. Under graduate qualifications are available but nothing more advanced, this must go hand in hand with stimulating maritime engineering research and studies within South Africa.

Finding common ground between STCW qualified engineers and ECSA registered engineers to enable a better transition of experienced sea-going engineers to the manufacturing, repair and education fields. There is an unresolved overlap between government departments, Dept of Transport and Dept of Public Works (Built Environment) that needs to have better alignment and co-ordination.

Other Matters

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

.SAIMENA COUNCIL 2021

My congratulations to the new SAIMENA Council members who were voted in at the AGM of 2021:

Appointment	SAIMENA No		Name	
President	2008010	F	Watson	K.J.
Snr Vice President	1990008	F	Foyle;	W.Q.R.
Junior Vice President	vacant			
Honorary Secretary	vacant			
Honorary Treasurer	1990013	M	Wood	P.G.L.
Past President	1987012	F	Gontier	L.M.
Cape Branch Chairperson	2009041	M	Dreyden	G.
Durban Branch Chairperson	1990008	F	Foyle;	W.Q.R.
Grading Committee Rep	1975166	HF	Deyzel	W.W.
Grading Committee Rep	2009040	F	Nieuwoudt	G.P.
Fellow TOJ Editor & ECSA R-95-PCE Reviewer	1983026	HF	Armstrong	I.F.
Fellow	1988020	F	Leeming	N.G.
Fellow	1980004	F	Mackie	K.P.
Member (Education liaison)	2001012	M	Roberts	M.A.H.
Fellow (Education / SAMSA liaison)	1975172	F	Fiddler	D.
Associate	vacant			

Take note that we are looking for appropriate SAIMENA members to fill the vacant positions as identified above, please contact me if you would like to assist.

Kevin Watson
President SAIMENA

Status Change	Member_No	Member_Name	Change_Date
Accepted as MEMBER	M2021008	P. Schneider	01-Feb-21
Accepted as ASSOCIATE	A2021004	C.J. André	19-May-21
Accepted as ASSOCIATE	A2021003	A.I. Incha	04-May-21
Accepted as ASSOCIATE	A2021002	J.G. Borja	24-Feb-21
Accepted as ASSOCIATE	A2021001	J.P. Tumbo	16-Feb-21
Accepted as RETIRED FELLOW	RF1975173	T.D. Forbes	05-Feb-21
Upgraded to Fellow	F2006008	B.W. Mvovo	18-Mar-21
Upgraded to Fellow	F2008001	J. Laubscher	17-Feb-21
Upgraded to Member	M2020003	F.S. Santos	21-Feb-21
Exempt section B 2.7.1	M1993070	R.V. Norman	22-Feb-21
Exempt section B 2.7.1	F1984007	T. Baker	21-Jan-21
Member re-instated as paid up	A2009025	M.S. Zondi	26-Feb-21
Resigned	M1984008	G.G. Calder	21-Feb-21
Resigned	F1989006	B.E. Jubber	14-Jan-21
Resigned	M1988022	A.G. Kukard	06-Jan-21
Suspended due to no fee payment.	A2009025	M.S. Zondi	25-Feb-21
Suspended due to no fee payment.	A2015001	G.L. Walker	25-Feb-21
Suspended due to no fee payment.	A2017003	R.V. Shabalala	25-Feb-21
Suspended due to no fee payment.	A2008025	R.L. Riekert	25-Feb-21
Suspended due to no fee payment.	A1992028	C.H. Opperman	25-Feb-21
Suspended due to no fee payment.	A2015004	J. Olwage	25-Feb-21
Suspended due to no fee payment.	A2016009	T.M. Ndhlovu	25-Feb-21
Suspended due to no fee payment.	A2009016	C.A. Kleinhans	25-Feb-21
Suspended due to no fee payment.	F1985012	R.W. Holmes	25-Feb-21
Suspended due to no fee payment.	A2005003	D.S. Gould	25-Feb-21
Suspended due to no fee payment.	A1992003	M.S. Els	25-Feb-21
Suspended due to no fee payment.	M2009037	H.W. De Voogt	25-Feb-21
Suspended due to no fee payment.	A2000002	D.C. Culey	25-Feb-21
Suspended due to no fee payment.	M2014006	R.F.D. Dias	24-Feb-21
Suspended due to no fee payment.	A2010009	M.S. Williams	24-Feb-21
Suspended due to no fee payment.	A2009001	P.M. Pillay	24-Feb-21

Amendments to SAIMENA Constitution:

These changes have been introduced into the SAIMENA Constitution after being voted in at the AGM of 2021:

Creation of SAIMENA Honorary Recognition grade.

This provides for SAIMENA to recognize and honour a non-Fellow member or a non-member of SAIMENA for exceptionally important services rendered to the professions in general and to the Institute in particular. Similar to the grade of Honorary Fellow.

Creation of Marine Partner grade.

As a result of a number of companies approaching SAIMENA for membership, the Marine Partner membership grade has been created for a company or organisation that is active in the marine industry or a supplier of equipment or services to the marine industry. Subsidiary companies or divisions of major companies may be Members in their own right. Each Marine Partner Member is entitled to nominate a representative to voice the views of the Company at meetings of the Institution. The Marine Partner shall not have voting rights. Marine Partner membership fees are based upon company size.

Insertion of SARS NGO requirements.

The exemption by SARS of SAIMENA in terms of section 10 (1)(d)(iv) of the Income Tax Act granted on 2005-10-26 has been amended. The main change that has been introduced is that the founding document must meet the requirements as set out in section 30B of the Income Tax Act. SARS reviewed the founding document (Constitution) of SAIMENA and advised that it did not contain all the relevant requirements. This change to the Constitution introduced the required amendments for full compliance.

The updated SAIMENA Constitution will be emailed to all members, and an insert page will also be sent out that members can print and paste into the current paper copy of the SAIMENA Constitution.

Kevin Watson
President SAIMENA

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The Editors Desk

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Covid is still with us and causing disruption but we managed to have a zoom meet for our national AGM. The national council and office bearers were elected plus some changes in the constitution put forward and agreed on, These are regarding the SARS requirements for a registered NGO and a change in the constitution in order to make the new grade of Honorary Recognition .

At the time of writing there are still restrictions as to gatherings which unfortunately means no functions are possible and Branch /Council meets can only be conducted online.

Apparently 33 cruise ships were either scrapped or sold in 2020 which is sad for that industry, but I wonder how many other types of vessels have gone to the scrapyard due to the pandemic.

There is an ever increasing objection to the use of fossil fuels in all areas and the upcoming conference in Glasgow on climate change could well lead to obligations by nations to reduce NOx emissions amongst others, which may affect the shipping industry in the not too distant future. Will nuclear power be back on the table? Or to allay fears of radioactive fallout will nations pour a lot more effort into the much safer fusion reactors as an energy source. Difficult to see windmill or voltaic cells being of use for sea transportation.

Haven't got all the details but it appears Unicorn Shipping has placed its headquarters in Singapore now and is lost, like SAFMARINE, to South Africa . Anybody got any further information. Does Unicorn man, or own any ships these days?

With Unicorn and SAFMARINE gone , is it fair to say South Africa now has no Merchant Marine , with at best only one ship on the books excluding the fishing fleet.

Belaying the question of business practice , is it in the country's interest to have no merchant marine? I know globalisation is based more on capitalistic principals, but should a conflict erupt, no matter how unlikely that may seem, we may need merchant ships . It would be interesting to have some comments on this,

Why do we need a deep sea navy if there are no merchant ships to protect?

I am always open to submissions from anybody for articles to be published in the TOJ, but any article submitted is subject to edit. I recently had one I had to refuse because the author had in it what I considered to be inappropriate content which the submitter would not allow me to delete. Although I rewrote the article and added pics, the original submitter was adamant his article in full should be published including derogatory content on named individuals , racism, sexism and other stuff that I refuse to allow. The TOJ is not a publication for a persons outrage or biased opinions (especially political). It is however a medium for meaningful information, human interest, current events, reminiscence, and a contact medium for SAIMENA members.

I would love to have your stories or any article, but let's keep it clean guys.

For my sins I somehow found myself in the working committee of the ECSA restructuring of the training guidelines for Professional Certificated Engineers. This project has as its aim to make all the Certificates of Competency (Factories, Mines, Electrical, Marine etc.), simplified and to find common ground for persons to become ECSA members.

Why? Well for Marine guys with C/Eng. Unlimited, ECSA has little knowledge of the qualifications and experience required to attain that CoC and that's where I come in.

The Editor

A Ships Stern

When we look at the stern of a ship, we often wonder as to why do ships have various types of aft end structures and what's the purpose of each one of them. While constructing and designing a ship, a number of factors such as hydrodynamic efficiency, construction simplicity, flow patterns & aesthetics are considered for designing a ship's stern.

In this article we will take a look at the common types of ship's sterns used. Basically, the following criteria governs the choice of the ship's stern form:

- It should be designed to provide low resistance
- It should be able to provide high propulsion efficiency by ensuring uniform inflow of water to the propeller

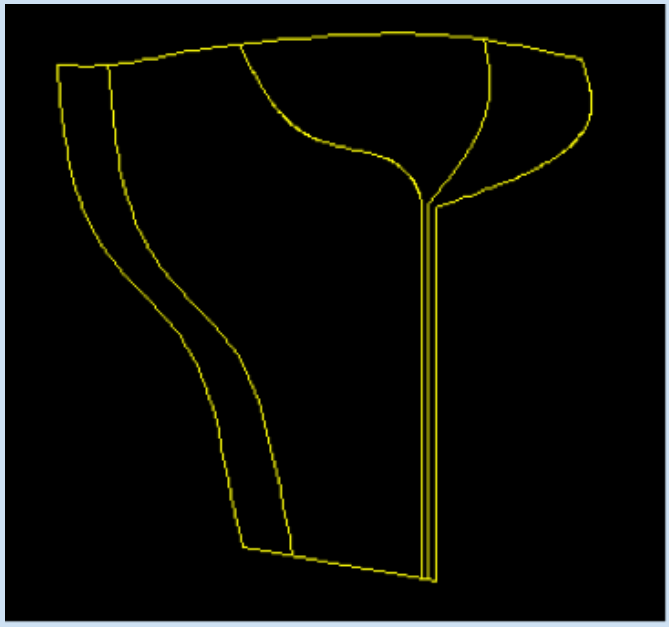
The design of the stern must avoid vibrations. Basically, the sterns can be broadly classified into the following –

- Elliptical Stern
- Cruiser Stern
- Transom Stern

The topside and the underwater form the two major parts of the stern. The above three types represent the topside.

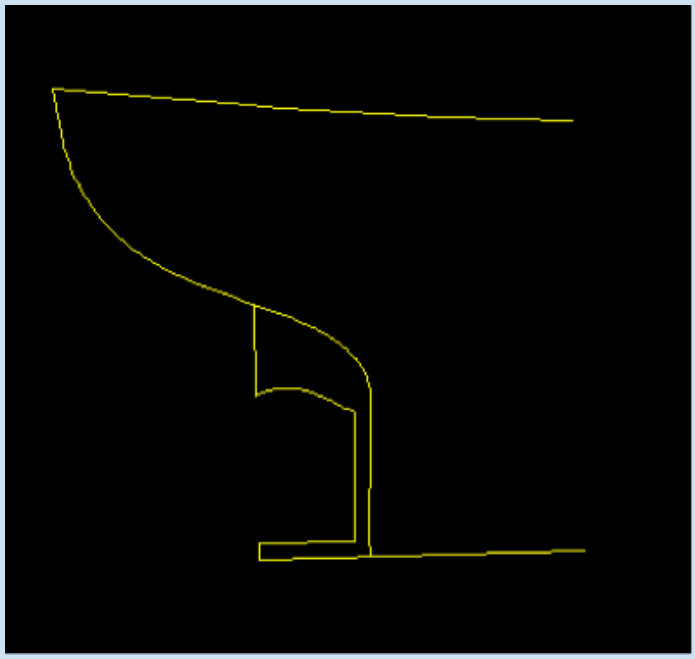
n addition to those mentioned above, there are numerous other special forms. Other types of stern include raked (or transom raked), transom flat, sugar scoop, lute stern & bustle stern etc. which are used on small vessels or yachts and are derivatives from the above three major types. Also these sterns can be used in combination of two such as flat transom & sugar-scoop together, also known as *constanzi stern,* which was used in the case of Queen Mary 2 for better efficiency and flow around the stern.
Considerable attention is paid to the overall design of the stern in order to improve the flow into and away from propeller. The cruiser stern was for many years the favored stern type for ocean going ships, but today most of these vessels have transom stern.

Merchant stern or elliptical stern or counter stern was the conventional form for cargo ships during the early 20th century. If viewed from above, the deck line and the knuckle line are roughly elliptical in shape. Counter stern or cutaway sterns are characterized by an upwardly curved profile, beginning fore of the aft perpendicular. They are similar to cruiser stern, however, on counter the cutaway for the rudder occurs above the waterline, and consequentially the counter stern has a pronounced aft overhang and exposed skeg. Benefits of having counter stern includes larger deck space in the aft, measurable amount of reserve buoyancy is provided and it also provides an aesthetic choice to the owner.



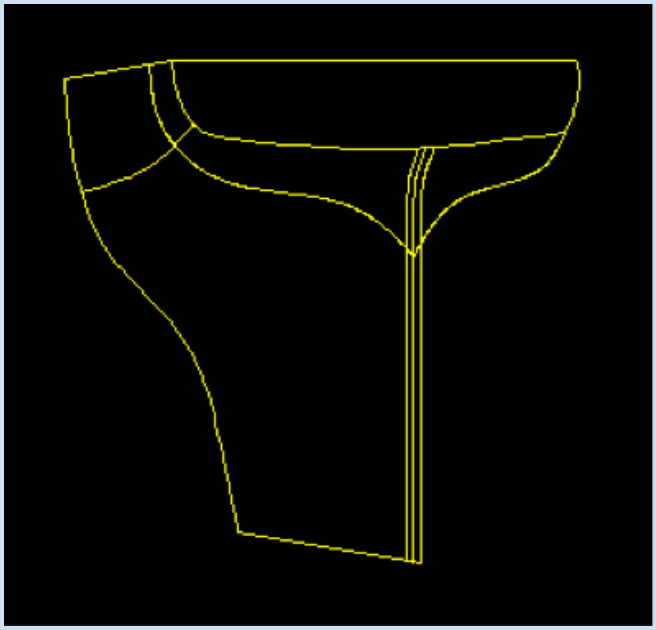
Elliptical Stern

The cruiser stern was initially designed only to lower the steering gear below the armour deck. A cruiser stern is characterized by an upward curved profile from the after perpendicular to the main deck or poop. Unlike the counter stern, a cruiser sterns cutaway for the rudder occurs below the waterline (the rudder is fully submerged at the design waterline). The cruiser has better resistance characteristics than the merchant stern. The length of the waterplane with a cruiser stern is greater than L_{pp}. A cruiser stern presents a more pleasant profile and is hydrodynamically efficient.



Cruiser Stern

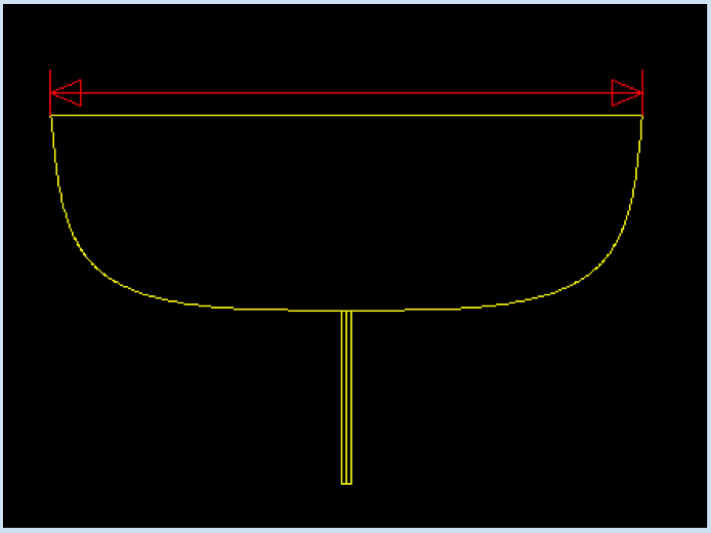
Basically a transom stern is a stern shape characterized by a generally flat shape extending to the waterline. The transom stern offers a greater deck area aft, is a simpler construction, and can also provide improved flow around the stern. The flat surface of any transom stern may begin either at or above the waterline of the vessel. Transom stern can be viewed as a cruiser stern whose aft – most portion is cut off.



Transom Stern

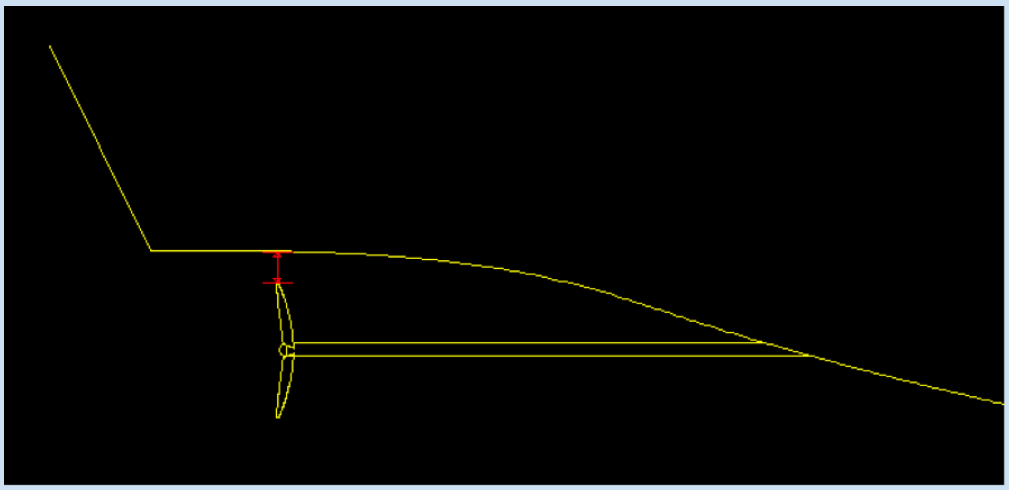
Design considerations on a deeply submerged square or transom stern:

- The edges of the square stern must be sharp so that the flow separates cleanly
- While optimising the design of the stern, stability of the ship is given more priority to the width of the stern



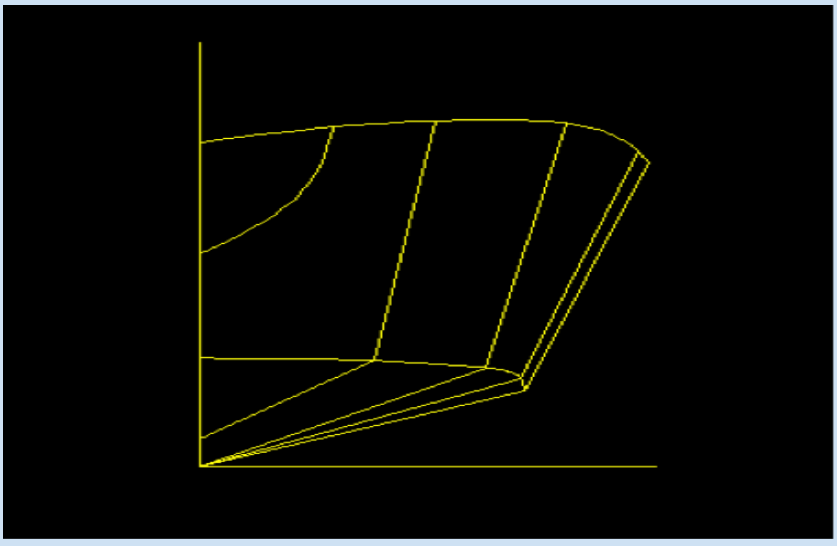
Width of transom stern represented in red

The stern, and in particular its underside, influences the propulsion efficiency. Lesser the turbulence in the area between propeller and outer shell above the propeller more will be its efficiency. Th
e space marked in red denotes the clearance area.



Clearance area for the propeller

- The resistance in slow-speed operation is noticeably higher in a transom stern than that of the ship with cruiser stern due to the formation of vortices.
- The deck on transom stern ships can easily get wet during reversing operations and in a heavy sea. The water is damped up. Flare and knuckle deflect the water better during astern operations avoiding deck flooding. The model given below shows a knuckle or chine of the ship.



Knuckle or Chine of a ship

The reduction in power of a transom stern compared with the cruiser increases with Froude number, i.e., approx. 10% at F_n = 0.5. This reduction in power is less due to the fact that the reduction in resistance is less, at the cost of improving the propulsion efficiency.

The Naval Architects of Queen Mary 2 designed a hybrid stern by melding a rounded into the square shape in response to the rough seas that the ship would experience in a North Atlantic winter. This is known as a Constanzi Stern. A constanzi stern provides the transom required for azimuthal pod propulsions, and provides better sea holding characteristics in a following swell than a standard transom stern.

The construction of the stern is one of the most difficult tasks during the ship production process. As the cruiser stern overhang may be subjected to large slamming forces, a substantial construction with adequate stiffening is required. Solid floors are fitted at every frame space, and a heavy centre girder is fitted right aft at the shell and decks. The stern plating is stiffened by cant frames or webs with short cant beams supporting the decks and leading to the adjacent heavy transverse deck beam. Further stiffening of the plating is provided by horizontal stringers extending to the first transverse frame.

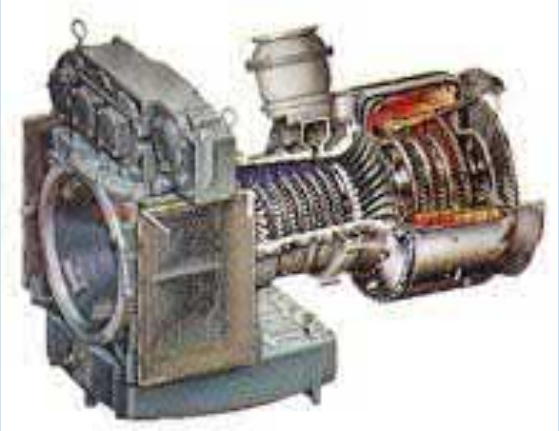
Cant frames are not required where the transom stern is adopted, as the flat stern plating may be stiffened with vertical stiffeners. Deep floors and a centre girder are provided at the lower region of the transom stern construction.

A lot of research is still carried out to find even better & effective aft-end structures in order to improve the hydrodynamic efficiency of the vessel starting with single stern design to a combination of two stern designs.

Acknowledgements: Tanumoy Sinha

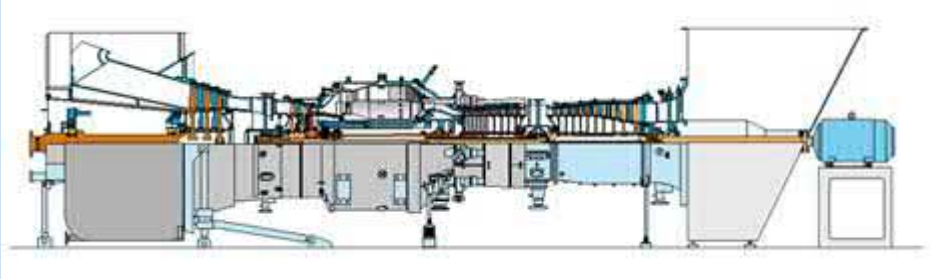
The Gas Turbine

The gas turbine is most familiar to people in it's application to the aerospace industry. They are found extensively on a wide range of planes and other aircrafts. Low weight to power ratio, it's compactness and a reliable simple design are some of the major advantages of these types of engine.



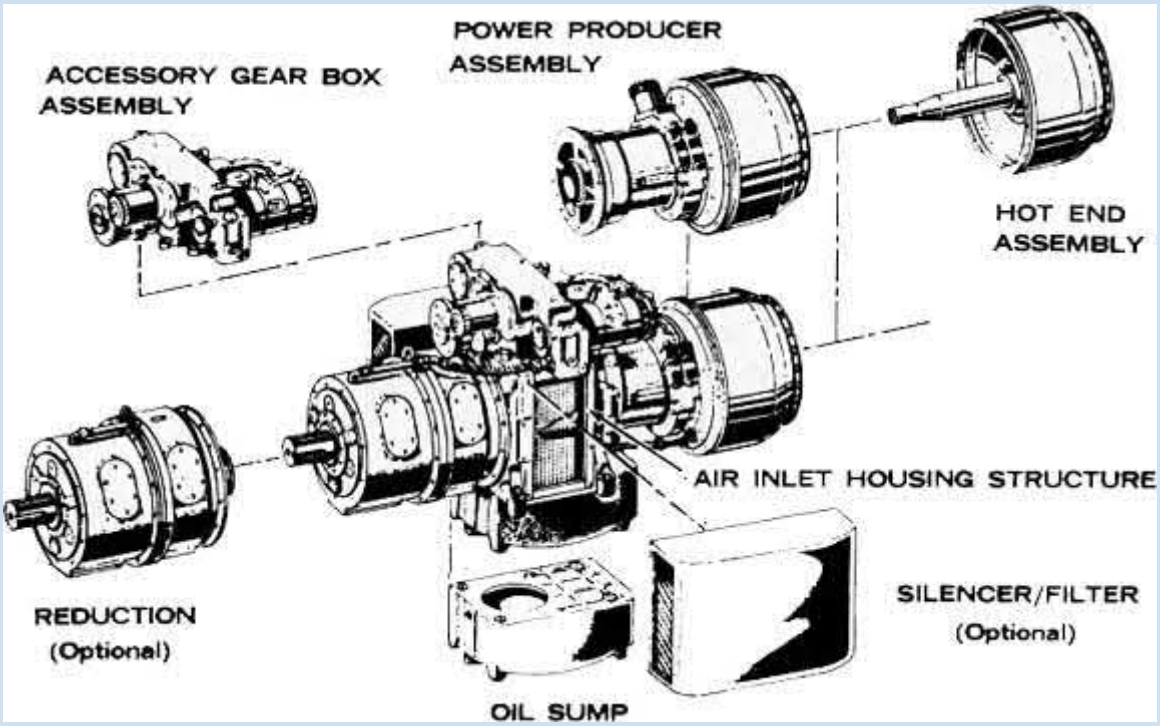
They are a precise machine, demanding precision machining and close tolerances. On this web page, we will only cover the basic principles of operation in order to build a knowledge base of marine propulsion plant and their benefits. I believe they will provide a viable alternative to the more common internal combustion prime mover and I encourage you to educate yourself more about them.

For the shipping industry, the advantages of the gas turbine have always been eclipsed by the disadvantages. Principally the high fuel and initial cost have made it an unattractive option for ship owners. The largest consumers of the marine gas turbine has traditionally been the navies and military of the world. Recent developments in gas turbines technology, coupled with lower oil prices (of the late eighties and nineties) and profitability in certain markets as made ship owners reconsider the values of the marine gas turbine. Before we get to these developments and applications, lets learn more about what is a gas turbine.



A turbine is a wheel that absorbs kinetic energy from a fluid stream. Water, steam, air are some fluids. Turbines can come in the form of a windmill, the water turbine of an hydroelectric dam, or the more sophisticated steam turbines or turbo fan under a planets wing.

Parts of a Gas Turbine



Gas turbine engines are, theoretically, extremely simple. Gas turbine have 3 parts:

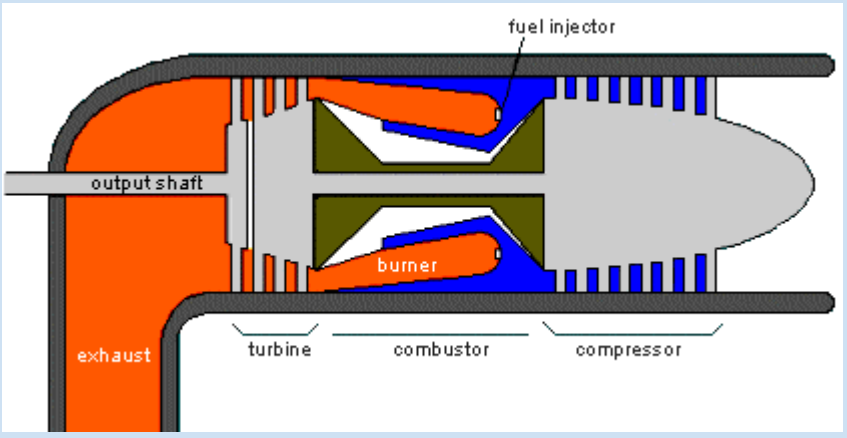
1 A compressor to compress the incoming air to high pressure.

2. A combustion area to burn the fuel and produce high pressure, high velocity gas.

3. A turbine to extract the energy from the high pressure, high velocity gas flowing from the combustion chamber.

Additionally the gas turbine may/will have these parts:

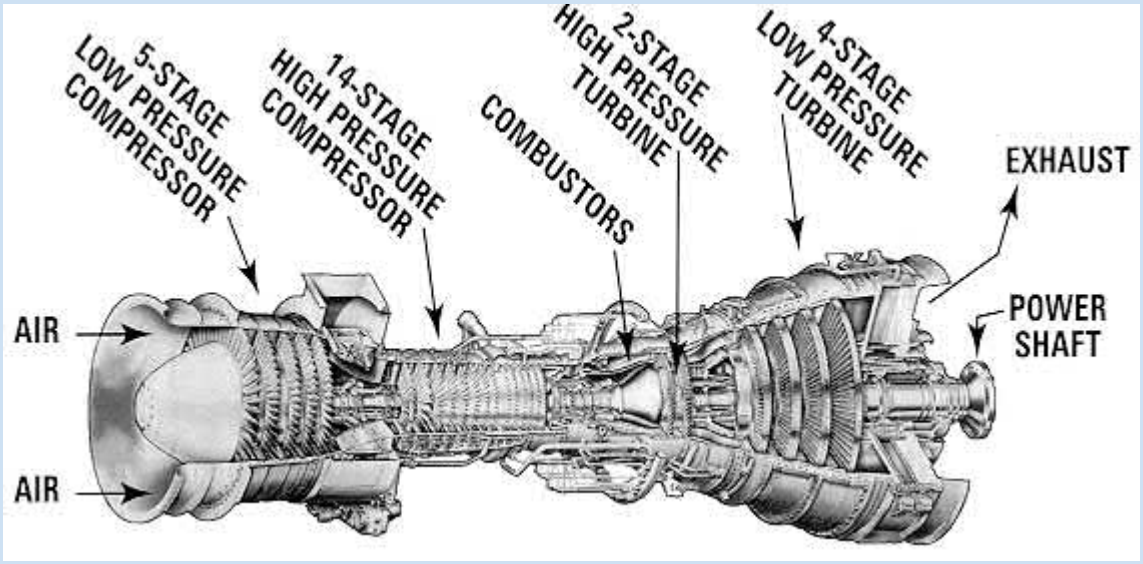
An accessory drive gear box, to drive various pumps for fuel, water and oil. A reduction gear box, to reduce the high revolutions of the turbine to a more efficient speed for the propeller.



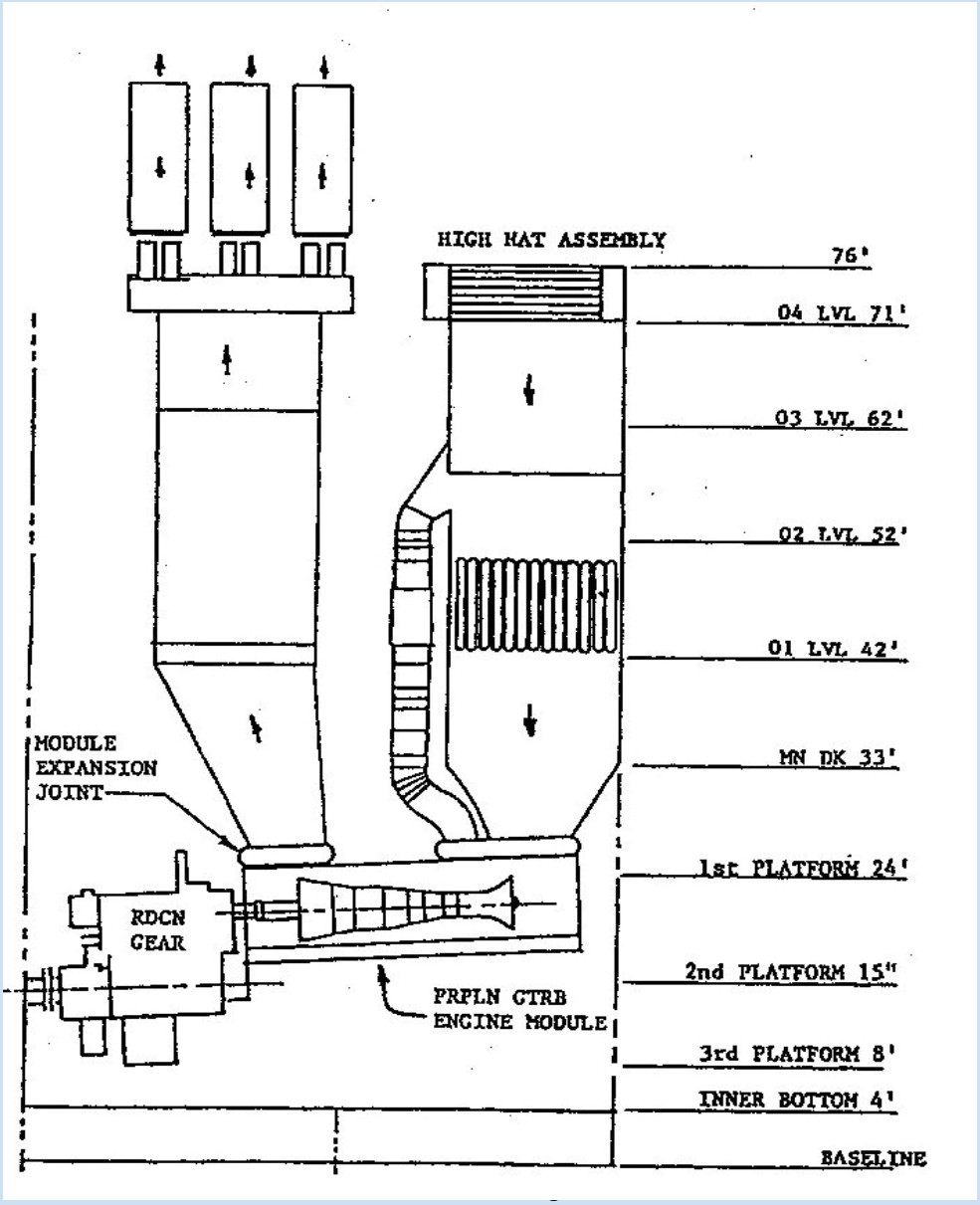
In the combustion area, the hot compressed air ignites the injected fuel. The fuel is typically a clean, low viscosity petroleum oil. The air / fuel ratio, most likely being 60:1 (by weight), ignites to produce high pressure gas, slightly contaminated with products of combustion. The gas temperature varies from 850 to 1100 degrees Celsius. It is then expanded through a nozzle to convert part of its thermal and pressure energy into kinetic energy. The resulting high velocity air stream impinges on the blades of the turbine.

Like all things explained they rarely relay the physical appearance and complexity it seems to have. The gas turbine relies on oil for lubrication of parts. Because of the high temperature reached by the oil leaving the bearing surfaces, 300 degrees as opposed to the normal 100 degrees, the preferred medium is synthetic oils. The passages and conduit for the oil adds to the complex look, as does the fuel delivery system which must introduce fuel in a uniform fashion throughout the combustor. The fuel is also heat treated to obtain the maximum efficiency from it.

Another "complication" often found on a marine gas turbine is the use of two turbine in series. In the above description, the power for the compressor is taken from the turbine itself. In a series setup, the first gas turbine -also know as the compressor drive, high pressure or gas generator provides the drive for the compressor. The second turbine - also know as the low pressure, free or power turbine is better suited to drive the propeller or generator. This splitting of functions, compressor and external load, provides a better torque characteristic such as the one needed for a ships propeller.



The operating environment of the marine gas turbine provides some unique challenges. Salty air for combustion has never really been a big problem for diesel engine or steam plants. But the large amounts of air required by the gas turbine allows a considerable amount of moisture to enter the engine, therefore the engine needs to be adapted to prevent corrosion and the blocking, by salt deposits, of passages. Another challenge that has to be considered with the gas turbine is the shock that a turbine is exposed to; pitching rolling, propeller vibrations and such. Proper care must be exercised to the design and maintenance of support and dampening structures.

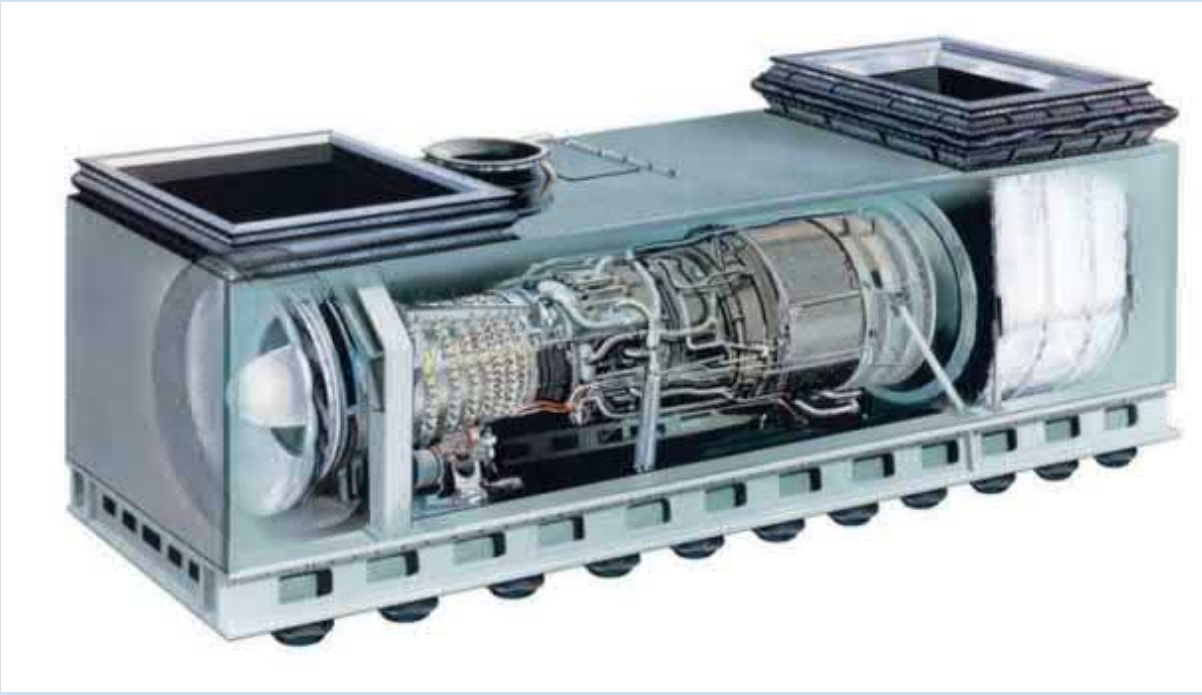


One of the gas turbines advantage is that power developed is usually what is wanted; a rotation force to turn a propeller or generator. Its competitor, the internal combustion engine, operating on the batch process (intake, compression, etc) and its inherent mechanical losses from the acceleration and decelerations of the pistons cannot compete with the fluid process of the gas turbine. Unfortunately, the high rotational speed of the turbine is not the best speed for a propeller; which is most efficient at around 100 rpm. The remedy for this, is the coupling of a gear box to the gas turbines output. This allows the gas turbine to operate at its most comfortable torque characteristic - high speed. The reduction gear box adds to the complexity of the set up, but allows the turbine, especially the single shaft gas turbine, which have poor torque characteristic at lower rpm, to operate at their ideal speed. The speed of the turbine is less critical in a series turbine which has excellent torque characteristic at most speeds.

The ship needs to go forward and reverse, how is that done? One way is the controllable pitch propeller (CPP). It allows the engine to rotate at its ideal rpm independently of the loading on the propeller. In other words, the shaft and propeller can turn at full rpm yet the propeller is not moving any water - in neutral. Until such time the controls tell the propeller to change the pitch of the propeller blades - allowing it to move water. In contrast, diesel engines have the ability to run in the opposite direction, which means the propeller shaft could be connected directly to the engine without needing a reversing gear box or CPP system.

One common setup of gas turbine powered boats is the use of water jets. This type of propulsion is effectively a big water pump driven by the gas turbine, with the water output directed where desired. This type of setup is common on the fast ferries and private yachts. Water jets are not exclusively driven by gas turbines, it is quite common to see a diesel engine driving the water jet unit.

Gas turbine prime movers are classified in one of two categories: the aero derivative and industrial engine. The aero derivative engine is an aircraft engine adapted to marine service. This is done by changing some components, or even coating them to properly function in the salty air of the marine environment. One example is the General Electric LM2500, weighing in at a thrifty 34,000 lbs (with mounts, enclosures and such) provides one horse power for every 1.5 pounds. In comparison, an industrial gas turbine like the GE MS5000, used in natural gas compression, provides 20,000 hp but weighs in at 200,000 lbs - 10 pounds for every hp. This is due to it's heavier construction. For further comparison; weight and volume of the machinery required by a 20,000 shp ship is about 100 tons for aero derive gas turbine, 400 tons for industrial gas turbine, 700 tons for diesel, and 800 tons for a comparable steam plant.

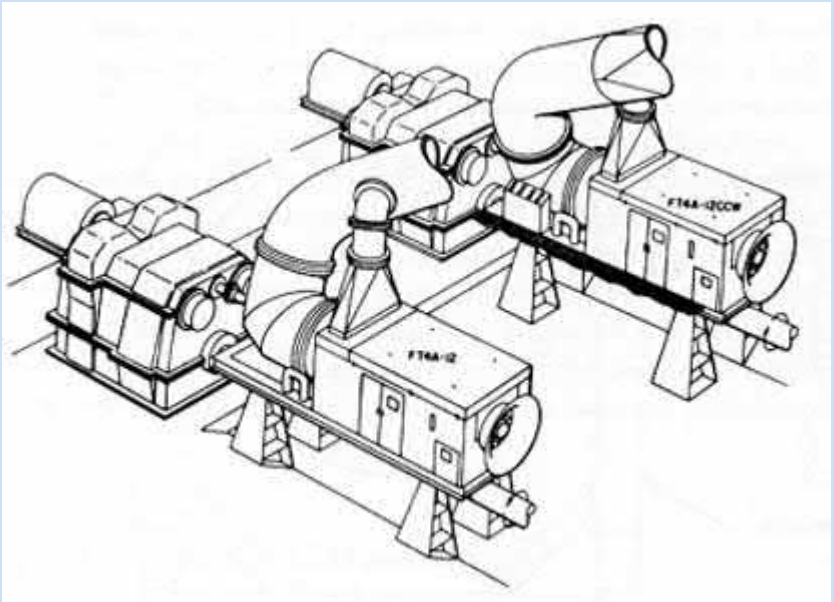


One benefit of the aero derived engines is the short amount of time for the engine to reach full operating temperature, this is due to the relative small amount of material used in its construction. As oppose to an industrial turbine, and the more common, diesel engine or steam plant. These must reach proper temperature before being fully loaded, this can take, in some cases, many hours.

The application of the gas turbine, as previously mentioned, has seen a bit of reversal of fortune. The traditional customers of gas turbines had been primarily the military. With the experience gained since the first gas turbines in the 1940s, and recent developments of fast ferries has made ship owners realize that a fast vessel can be profitable, and that consumers want it. This has given way to explosive growth in this field.

In the case of fast ferries, the emphasis is on "fast". Which means you need to be light, a challenge which has been met with various degrees of success by the diesel engine. Naturally, the gas turbine has been nipping at the heels of diesels for a long time. The light, powerful gas turbine is an attractive alternative to diesels, and with the weigh/space saving, the expense is somewhat comparable. The initial cost and the daily fuel cost seems to scare some of the would be owners. But I think it is important to mention that the overall cost, where many factors must be considered will provide a clearer picture.

With all this attention in the fast ferry world, the gas turbine has been garnishing a lot of other enthusiasts. High end private yachts have been installing more and more of them, they are affectionately know as "hair dryers". The major stumbling block in its acceptance in the commercial shipping circle is its inability to burn the cheaper, dirtier heavy fuel oils. But this is only a matter of time.



Acknowledgements: Martin Leduc

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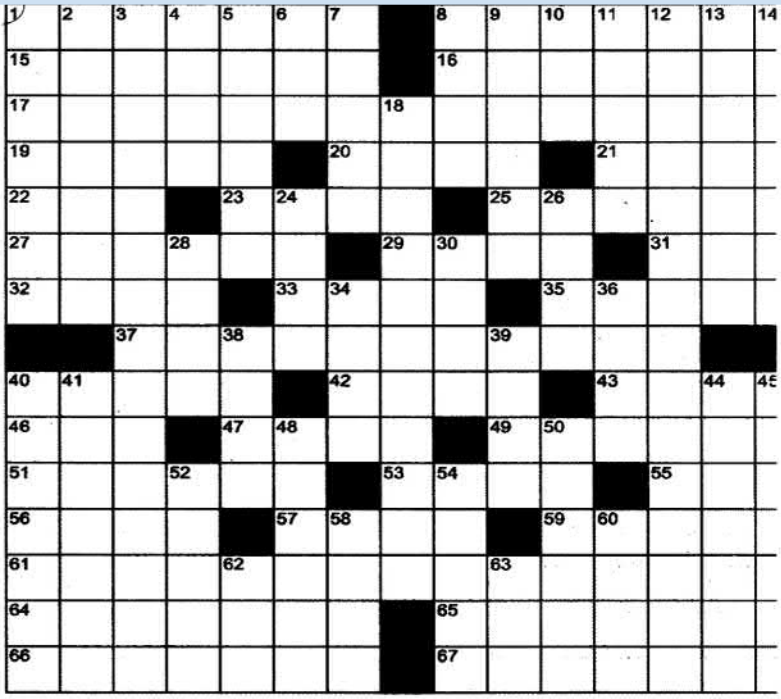
TOJ Crossword

ACROSS

1 Wants, with "to"
8 It may be held in battle
15 1977 Jacqueline Bisset movie
16 Literary critic Broyard
17 Acted unfairly
19 Aluminum foil alternatives?
20 Quite
21 Liability-limiting words
22 Natl. Humor Month
23 One in Germany
25 Slough
27 One may be called in court
29 Holiday time
31 It might go for big bucks
32 Equestrian's command
33 Bit of evidence in court
35 Concertedly
37 21st-century epidemic concern
40 Flibbertigibbety
42 Hymn words before "beyond all praising"
43 Get hush money from, for instance
46 It's "not master in its own house," said Freud
47 Family: Abbr.
49 Stop-press order?
51 Kind of 6-Down
53 Lord's domain
55 It once stretched from France to Russia: Abbr.
56 Shakespearean words following "Speak, hands, for me!"
57 "___ well"
59 ___ rage
61 "Not to my recollection"
64 Scholar
65 "The Morning Show Murders" novelist
66 Bleach component
67 "Happy" sorts

DOWN

1 Deep down
2 U.P.S. customer
3 Easter character
4 "___ delighted!"
5 Candy brand
6 One that swims with a current?
7 Cuddle, in a way
8 Broadway smash whose poster image consisted of just two eyes
9 Like some nursing
10 ___ Bo
11 Being tried
12 Registers surprise, say
13 National Book Award-winning novelist named after Emerson
14 "Hmmm ..."
18 Never
24 Motor add-ons?
26 Patron saint of carvers
28 Biblical endings
30 Prefix with -phile
34 Bad way to go
36 Refuse at a mill
38 Name abandoned for Rochester
39 Skirt
40 Ruses
41 "Understood"
44 Dine at another's house
45 Some deals
48 Took out
50 Maintain



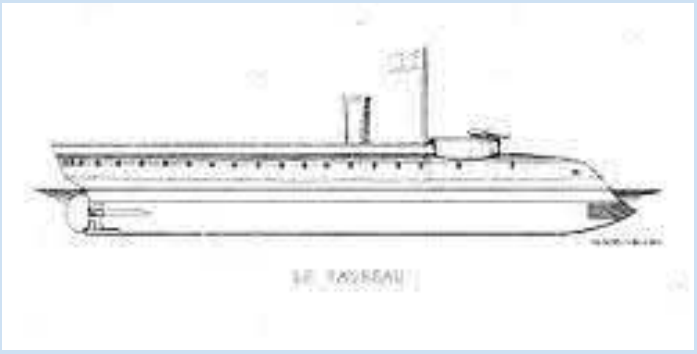
52 TV detective Peter and others
54 One spared in a sacrifice
58 Superman's mother
60 Blue-roofed chain
62 It's declared after the last hit, for short
63 Grp. in 1974 news

The Ram Bow

If you look at warships built towards the end of the nineteenth century and early twentieth century, you nay notice that the bow is often inverse and many of you I am sure would equate this to early experimentation to the modern bulbous bow. But you would be wrong. The galleys of ancient Rome or Carthage show the ram bow as a weapon and this was not lost to the naval powers when Iron and steel become the hull material of warships.

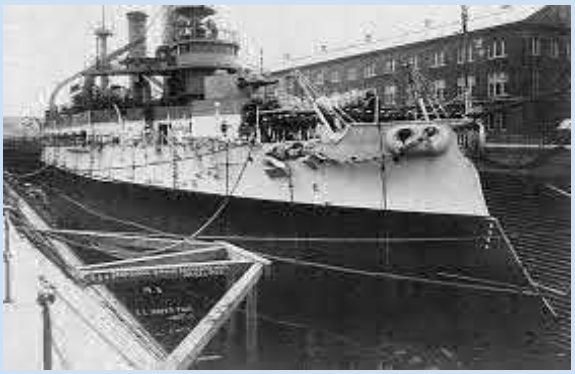
Many 19th Century ironclad battleships were equipped with rams. The speed, power, and manoeuvrability allowed by steam propulsion again raised the idea of using the ship's hull as a weapon. As early as 1840, the French admiral Nicolas-Hippolyte Labrousse proposed building a ram steamship, and by 1860, Dupuy de Lôme had designed an ironclad with a ram. The quick success of the CSS *Virginia'*s ramming attack on the *USS Cumberland* at the Battle of Hampton Roads in 1862 attracted much attention and caused many navies to re-think the ram. The first coastal battleship, France's *Taureau*, was built in 1863 for the purpose of attacking warships at anchor or in narrow straits, and was armed with a ram. Many ironclad ships were designed specifically to ram opponents, such as the *General Price*. In ships of this type, the armour belt was prolonged to brace both sides of the ram to increase structural integrity.

The theory behind the revival of the weapon derived from the fact that, in the period around 1860, armour held superiority over the ship-mounted cannon. It was believed that an armoured warship could not be seriously damaged by the naval artillery in existence at the time, in order to achieve a decisive result in a naval engagement. Therefore, alternative methods of action were believed to be necessary. As it followed, from the same belief, that a ship armed with a ram could not be seriously damaged by the gunfire of its intended victim, the ram became, for a brief period, the main armament of many battleships. It was observed that the guns placed on the *Taureau* were there "with the sole function of preparing the way for the ram."



The frequent use of ramming as a tactic in the Battle of Lissa (1866) and, to a lesser extent, at the Battle of Iquique also led to many late nineteenth century naval designers equipping their warships with ram bows. This only really aggravated a number of incidents of ships being sunk by their squadron-mates in accidental collisions as ramming never featured as a viable battle tactic again. The fixation on ramming may also have inhibited the development of gunnery.

When it became clear, towards the end of the nineteenth century, that breech-loading cannon could hit, and hit effectively, enemy ships at several thousand yards range, the ineffectiveness of the ram became clear and ships ceased to be fitted with them.



Ballast Water Management

Keeping Our Oceans and Harbours Clean with Ballast Water Management Systems (BWMS)

Cruise ships, large tankers, and bulk cargo carriers use a huge amount of ballast water, which is often taken on in coastal waters in one region and discharged at the next port. Ballast water discharge typically contains a variety of biological materials, including plants, animals, viruses, plankton and bacteria. These materials often include non-native, nuisance, exotic species that causes extensive ecological and economic damage to aquatic ecosystems.

To react to the growing concerns about environmental impact of ballast water discharge, the International Maritime Organisation (IMO) created in 2004 the "International Convention for the Control and Management of Ships' Ballast Water and Sediments" to control the environmental damage from ballast water. The Convention requires all ships to implement a "Ballast water management plan" including a ballast water record book and carrying out ballast water management procedures to a given standard. Guidelines are given for additional measures then the guidelines.

The goals of the convention are to minimise damage to the environment by:

The goals of the convention are to minimise damage to the environment by:

- Minimise the uptake of organisms during ballasting.
- Minimising the uptake of sediments during ballasting.
- Ballast water exchange while at sea (the ship should be minimum 200 nautical miles from shore with a depth of minimum 200 metres and can use the flow through or sequential method). At least 95 percent of the total ballast water should be exchanged.

Treatment of the ballast water

Control measures include:

- International Ballast Water Management Certificate
- Ballast water management plan

Ballast water record book

The IMO convention was ratified by enough countries and entered into force on September 8, 2017.

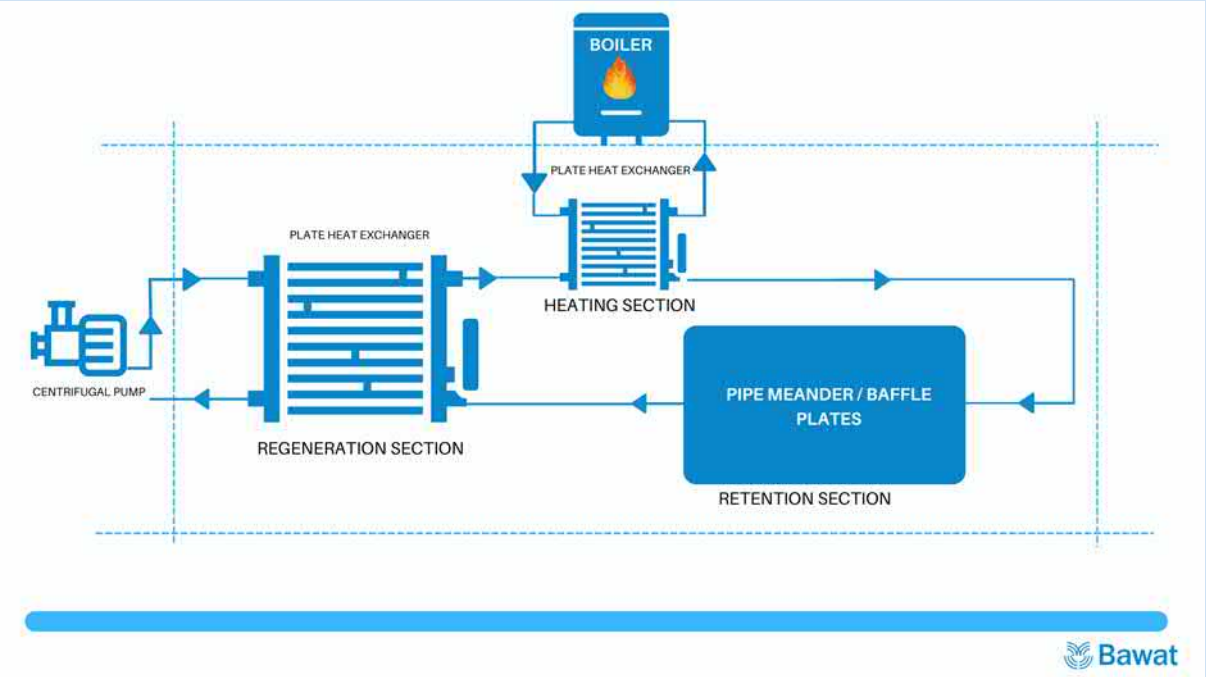
The IMO convention has made a schedule for implementation that means that compliance with D2 standard will be phased-in over time for individual ships and more and more ships will become compliant up to 8 September 2024

Types of Ballast Water Management Systems

There are many types and suppliers of ballast water management systems (BWMS) offering different solutions to treating ballast water using among other filters, chemicals or UV lighting.

A new player in ballast water management is Bawat, who have taken a different approach in treating ballast water. The technology used is pasteurization which is a well-known and very efficient process to kill bacteria and plankton. The pasteurization process is a combination of heat and time. Applied on ballast water, the water only needs one pass through the BWMS. In this process all foreign species are killed and the ballast water is fully D2 compliant in accordance to the IMO criteria for ballast water discharge.
Prior to discharge the excess heat from the pasteurized water is re-used to heat the incoming ballast water and discharged at sea level temperature

The figure below shows how one-pass pasteurization technology works:



It is a much more environmentally friendly approach and moreover as there are no filters to dispose of or the like it leaves maintenance at a low.

The system comes both as an onboard solution and a containerized mobile solution. With the onboard ship solution, you can treat the ballast water while in-voyage and thereby leave all in-port operations to other things than focusing on managing your ballast water. Moreover, it comes in a containerized mobile solution where you can place the unit in a harbor, shipyard or terminal and service more vessels. This is a great solution if you have more vessels to service in one place or if you as a harbor authority have issues with approaching vessels that have a malfunctioning BWMS on board then the harbor still have a solution available where the water can be treated before discharging.

This system requires very little maintenance and uses standard marine components making it easy to operate and simple to maintain for crew.
When the ballast water has passed the system, the ballast water is in full compliance with the BWM convention and can be discharged in the harbour.

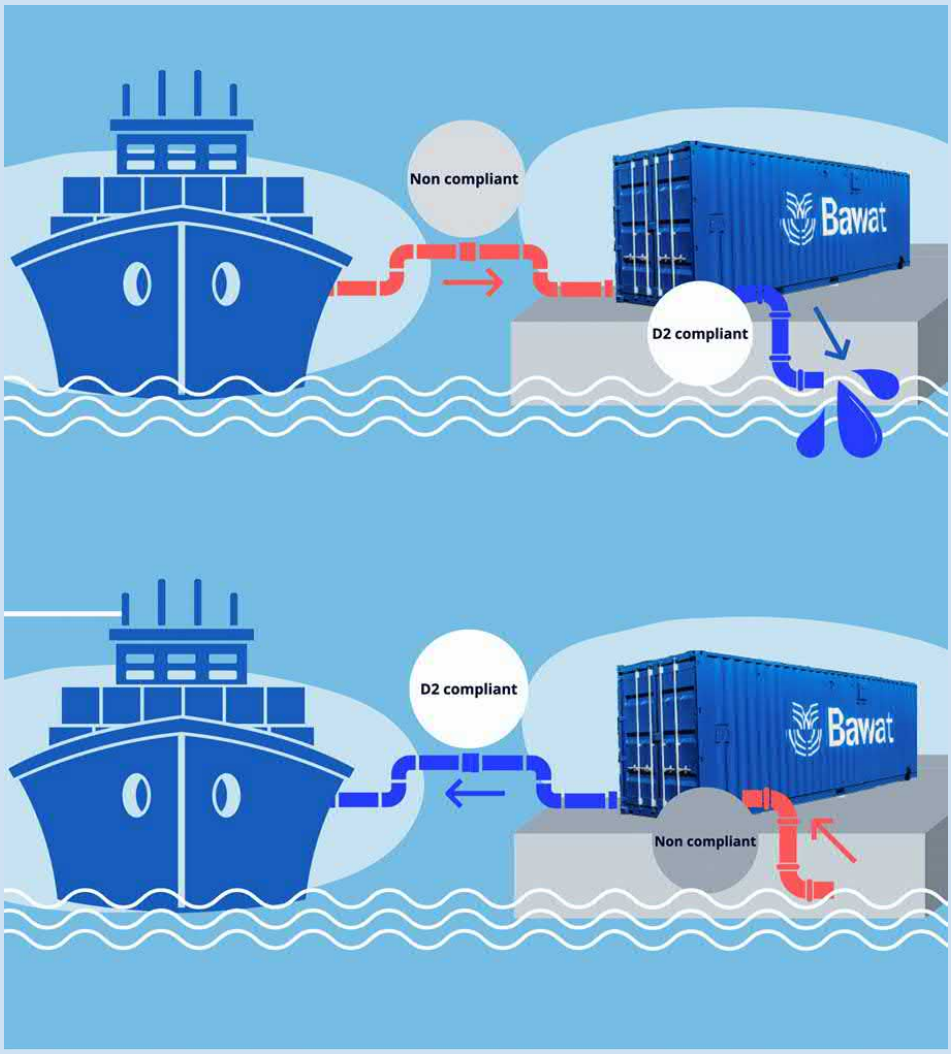
Vessels can also be ballasted with treated water if needed, by taking water from the harbour and pump it through the BWMS and into the ballast tanks of the vessel. This is only possible because of the one-pass treatment technology.

THE BENEFITS:

- No filters, meaning no clogging and filter cake
- One-pass system
- No holding time
- No UV bulbs or chemicals
- Independent of water turbidity, salinity, and temperature
- The system is easy to mobilize, connect, operate and simple to maintain

Composed of proven standard marine components only

The below illustrations show how the containerized mobile BWMS works to make the D2 compliant



Acknowledgements: BAWAT

News Snippets

1. A senior Russian security official said on Thursday that Moscow had used its navy and air force to expel a British warship, HMS Dragon, from what he described as Russian territorial waters near Russian-annexed Crimea last October.

2. Cargo ships CHUANG XIN 8 and YI GANG WU MAO 20 collided at around 2145 Beijing time May 29 southeast of Shanghai near Banyang Jiao Reef. CHUANG XIN 8 sank after collision, of 20 crew on board 19 were rescued

3. General cargo ship NAZMIYE ANA capsized while performing cargo operations at Castellon port, Spain, Med, in the evening May 28. The ship capsized upside down with superstructure resting on the ground and bottom being above waterline. Two crew are missing

4. The Floating Storage and Offloading (FSO) tanker J. NAT has been beached on the shipbreaking shores of Gadani, Pakistan despite clear warnings by Interpol and international civil society groups that the vessel contains high levels of toxics.

5. Oceania Marine Energy ("Oceania"), an Australian company focused on connecting natural resources and energy production to the shipping industry, and Kanfer Shipping AS ("Kanfer"), the Norway-based shipping company focusing on small-scale LNG sea transportation and LNG bunkering have signed a Letter of Intent (LOI) to bring the world's first ammonia-ready LNG bunkering vessel to Australia

6. An innovative underwater robot known as Mesobot is providing researchers with deeper insight into the vast mid-ocean region known as the 'twilight zone.' Capable of tracking and recording high-resolution images of slow-moving and fragile zooplankton, gelatinous animals, and particles, Mesobot greatly expands scientists' ability to observe creatures in their mesopelagic habitat with minimal disturbance.

7. Ahead of the opening of MEPC 76, Norway-based marine engineering specialist TECO 2030 urged the IMO to recognise the role carbon capture will play in reducing greenhouse gas emissions from international shipping. A rare Antarctic solar eclipse is coming up in December but getting there from SA is costly Excluding flights to either Chile or Argentina, you can expect to pay at least R225,000 per person. If money's no object, there are packages that cost in excess of R1 million per person**.**

8. Japanese shipbuilding and engineering firm Kawasaki Heavy Industries (KHI) is a step closer to a target ed launch of a 160,000m³ liquefied hydrogen carrier in the mid-2020s by completing development of a liquefied hydrogen containment system for the planned vessel

9. Japanese shipping group Tsuneishi and Belgian shipping firm CMB have agreed to build a hydrogen-powered tugboat, following their development of the first hydrogen-powered ferry to operate in Japan.

10. Debmarine Namibia, a subsidiary of Anglo American's diamond unit De Beers, on Monday reported a 13% drop in production to 1.125 million carats last year as demand slumped during the COVID-19 pandemic.

International Maritime Organization bans toxic paint substance cybutryne

in International Shipping News 22/06/2021

At the 76th session of the Maritime Environmental Protection Committee (MEPC 76), the IMO has prohibited the use of cybutryne in antifouling systems (AFS) from 1 January 2023, as studies have proven that the substance is harmful to a variety of marine organisms.

After the International Convention on the Control of Harmful Anti-Fouling Systems on Ships (AFS Convention) took effect in 2008, tributyltin (TBT) was removed from anti-fouling paints and replaced by several new biocides. One of these replacements was cybutryne which is used in hull paint to prevent biofouling growth.

In 2019, it was brought to the attention of the IMO that cybutryne is acutely and chronically toxic for a variety of marine organisms and in some respects even more harmful than TBT. The substance accumulates in sediments and causes long-term effects on the marine environment. As such it should not be permitted.

New regulation

At the 76th MEPC session, IMO adopted amendments to the AFS Convention regarding controls on cybutryne and the form of the International Anti-fouling System Certificate. The amendments will enter into force on 1 January 2023. From this date, the application or re-application of an AFS containing cybutryne will not be permitted.

Ships bearing an AFS that contains this substance in the external coating layer of their hulls or external parts or surfaces shall either:

- remove the anti-fouling system; or
- apply a coating that forms a barrier to prevent cybutryne leaching from the underlying AFS.

This amendment applies to all ships except existing fixed and floating platforms, floating storage units, and floating production storage and offloading facilities that have been constructed and not been in dry-dock on or after 1 January 2023; ships not engaged in international voyages; and ships of less than 400 gross tonnage engaged in international voyages, if accepted by the coastal State(s).

Acknowledgements: Chemdetect