The South African Institute of Marine Engineers and Naval Architects

SAIMENA

The Two Oceans Journal

2nd Edition 2018

National Council 2017/2018

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Editors:

Iain Armstrong and Org Nieuwoudt

2018 2nd Edition

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The opinions expressed in this Newsletter are those of the writers and not necessarily those of SAIMENA or this newsletter's editors .

Presidents report

I'm pleased to be given a chance to steer SAIMENA for another term. I would like to thank the Past President, Louis Gontier, who steered SAIMENA for the past term, and the members of Council who support our activities, and those who joined the new Council at the AGM earlier this year.

This year has been a bit uncertain and unstable for SAIMENA. The Durban Branch has eventually lost SAIMENA House due to a long discussed building re-development start, resulting in the Branch having to relocate to temporary premises. We have been lucky enough to have Quentin Foyle (Durban Branch Chair), offer us the use of the Unicorn Training Facility as a base for future meetings and also as a place to store the SAIMENA memorabilia and possessions. The Branch however has a strong committee which steers branch affairs and continues to strive to encourage new members to join, albeit with limited response.
The Cape Branch continues to operate from the Survival Training Centre at Granger Bay, courtesy of the Cape Peninsula University of Technology to whom we are grateful for their ongoing support. The Cape Branch however suffers from apathy of local members to serve on the Branch Committee, which has to rely on an ever reducing numbers of dedicated members to keep the Branch functioning, led by Graham Dreyden (Cape Town Branch Chair) supported by a few other members.

Both branches have had an active period, reported on by the Branch Chairs in this issue of the Two Oceans Journal.

There have been large changes on the professional engineering front, with ECSA having revised some of it operating principles relating to its relationship with Voluntary Associations (such as SAIMENA) and also the registration of members of the engineering family. The good standing of SAIMENA relies on support of its ECSA registered members in order that we can continue to voice our opinion at the council level of ECSA to strive to improve the position and standing of Maritime Engineering with the South African engineering fraternity. We need your inputs and ideas of how ECSA could better serve our registered members, please communicate this directly to myself if you wish.

The manner of registering new professionals has changed at ECSA with the dissolution of the old Professional Advisory Committees (PAC) that played a key role in assisting with the process but resulted in limited engineering branches being used for this process. The new registration process now relies on individuals apply to ECSA to become Assessors of new professional applicants in all directions, including Maritime, and in all the engineering grading of Pr Eng, Pr Tech, Pr Techno and Cert Eng; thus I request that all SAIMENA professional members seriously consider apply to become involved in the process, thereby being able to grow the professional family in the Marine and Naval Architecture engineering fields. There are currently no maritime related professionals serving at ECSA to assess new applicants at present. This is an indictment on our profession.

We need to encourage new younger members to not only join SAIMENA but to become involved in creating the future direction of SAIMENA. You can only make a difference by becoming involved, I challenge you to take up this offer.

We also need to get more lady members and our growing numbers of black engineers to also join SAIMENA and become involved in the institute and council affairs. This is the only way we can grow to look after the interests of all people involved in maritime engineering and to be representative of the whole maritime engineering community.

I look forward to your inputs and active participation during the year ahead, and to growing a healthy and active SAIMENA. The growth and success of Operation PHAKISA requires all our active participation.

R Adm(JG) Kevin Watson, Pr Eng
President SAIMENA

Durban Branch Report

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2018 is passing rapidly, and before we know it the year end festivities will be with us.

We have had a number of papers presented this year. With SAIMENA Room being unavailable, we have been fortunate to be able to utilize the Grindrod Training Centre auditorium.

Attendance has been mixed – with one meeting having only 8 members. However, the next meeting had some 50 attending, which was achieved with some effort in contacting members.

The news from Durban as far as regards Berea Rovers goes has not been good. Despite promises from the developer last year, nothing has materialized in the development of the property. Berea Rovers are still attempting to revive the club there.

In June, it was arranged to remove all the artifacts and documents from SAIMENA House. When members, together with the assistance of EBH, arrived at Berea Rovers, it was found that the building had been accessed and a number of areas ransacked and vandalized. The air conditioner compressor units and internal toilet fittings etc. were also stolen, with the damage to building and ceilings etc. Unfortunately, a model of a sailing vessel on loan from Trevor Burnett had been smashed and most of the model stolen. Trevor had been instrumental in the building of SAIMENA House.

A sad end to a wonderful venue, where many enjoyable meetings were held.

All artifacts and past records were transported to the Grindrod Training Centre and are in storage there. The larger items, such as the propeller and anchor will displayed at the Training Centre.

Various magazines and publications from the store room have been donated to the Port Natal Maritime Museum and catalogued for storage in the media centre there.

On the social side, the first luncheon of the year was held at the Royal Durban Golf Club, and well attended.

In July, an excursion was arranged to the tunnel under the harbour entrance, followed by lunch at the Durban Water Sports Club, situated on the north side of the harbour entrance. This proved very interesting and was well attended. The walk through the tunnel, and to the end of the south pier, provided good exercise for many.

The tunnel contains pipes for sewage to the sewage plant on the Bluff, as well as power and communication cables

.

Various meetings and social functions, including a Chairman's Evening and Golf Day, are planned for the rest of the year.

Rogan Troon – Durban Branch

Cape Town Branch Report

The last Branch meeting was held on Thursday the 23rd at Cummins SA in Bellville. We have had a good run of presentations at venues of the presenters with our July meeting held at the Institute for Maritime Technology a Division of Armscor SOC Ltd in Simonstown. The meetings include guided tours around the premises.

Numbers attending are still very low. Average about 12 members. This is concerning as the presenters put a lot of effort into arranging the event and includes providing the drinks and snacks. In most instances they will keep a number of their staff behind to assist with facilitation of SAIMENA.

Recently one of our committee members has resigned and another has requested to be replaced in due time. This places quite a burden on the remanding committee members as we are now down to 3. A message was sent out to all branch members to volunteer. If any of the members would like to nominate possible candidates it would be appreciated.

On the other hand, application for new branch members had been good.

Events attended to date 2018

- TETA – workshops on the maritime sector regarding skills and occupation trends in Cape Town
- CPUT- orientation day for the 2018 student intake
- SAIMI - workshop on the development of capacity for Naval Architecture qualification in South Africa

  DOT and SAIMI - Incident Management System (IMS) 100 and 200 training

Open Events

Cape Branch annual lunch planned for 21st September 2018 at the Royal Cape Yacht Club. Dr. Oswald Franks Executive Dean Faculty of Engineering, the Built Environment and Information Technology Campus at NMMU has been invited as the guest speaker.

Dance evening still to be finalised. Lack of committee members to assist causing delays

William Froude wreath laying Ceremony in November.

EXCO Meeting

Next meeting 1st quarter of 2018 (date TBA)

Monthly Meetings and presentations

Two more branch meetings planned for 2018. October and November
Kind regards,

Graham Dreyden

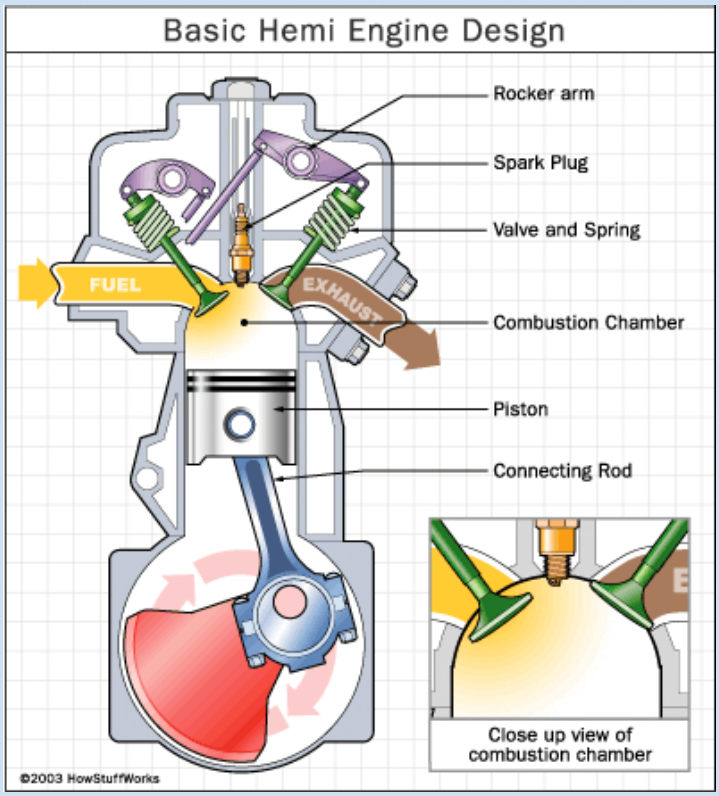
Combustion in Head Design

Although rather old in terms of the design of heads in automobile engines the following types of heads are of interest for four stroke petrol engines.

The Hem Head

'Hem' stands for 'hemispherical' and is descriptive of this type of head. It developed much more power than other engines of the day due to the efficiency of the **combustion chamber** .

In a HEMI engine, the top of the combustion chamber is **hemispherical**, as seen in the image below. The combustion area in the head is shaped like half of a sphere. An engine like this is said to have "hemispherical heads." In a HEMI head, the spark plug is normally located at the top of the combustion chamber, and the valves open on opposite sides of the combustion chamber.



The Flathead

The head in a flathead engine is extremely simple : - it is a solid metal casting with a hole drilled in it to accept the spark plug. The camshaft in the block pushes directly on the valve stems to open the valves, eliminating the need for pushrods and rocker arms. Everything is simpler in the flathead design. The problem with a flathead engine is its thermal efficiency.

There are many different parts of an engine's design that control the amount of power you can extract from each combustion stroke. For example:

A) You want to burn all of the gas in the cylinder. If the design leaves any of the gas unburned, that is untapped energy.

B) You want the maximum cylinder pressure to occur when the crankshaft is at the right angle, so that you extract all of the energy from the pressure.

C) You want to waste as little of the engine's energy as possible, sucking air and fuel into the combustion chamber and could leave some of the gas unburned. That is untapped energy.

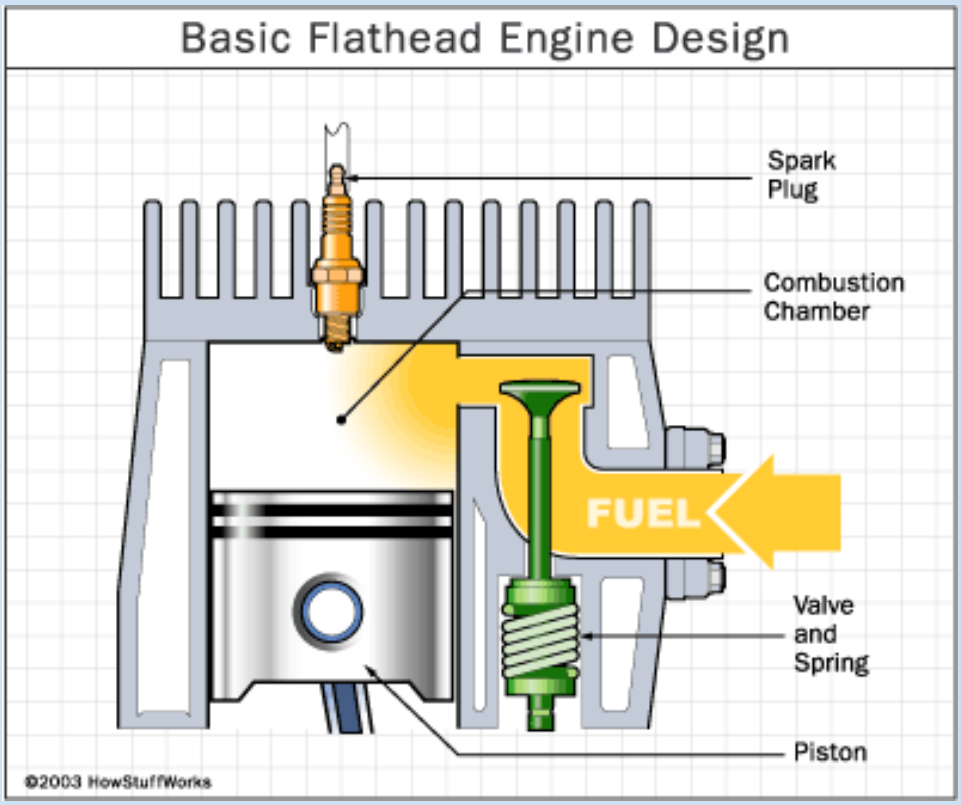
D) You want the maximum cylinder pressure to occur when the crankshaft is at the right angle, so that you extract all of the energy from the pressure.

E) You want to waste as little of the engine's energy as possible, sucking air and fuel into the combustion chamber and therefore pushing the exhaust out.

F) You want to lose as little heat as possible to the heads and the cylinder walls. Heat creates pressure in the cylinder, so lost heat means lower peak pressures.

All of the above are not at peak efficiency in a flathead design. And the amount of surface area relative to volume of the combustion chamber is large.

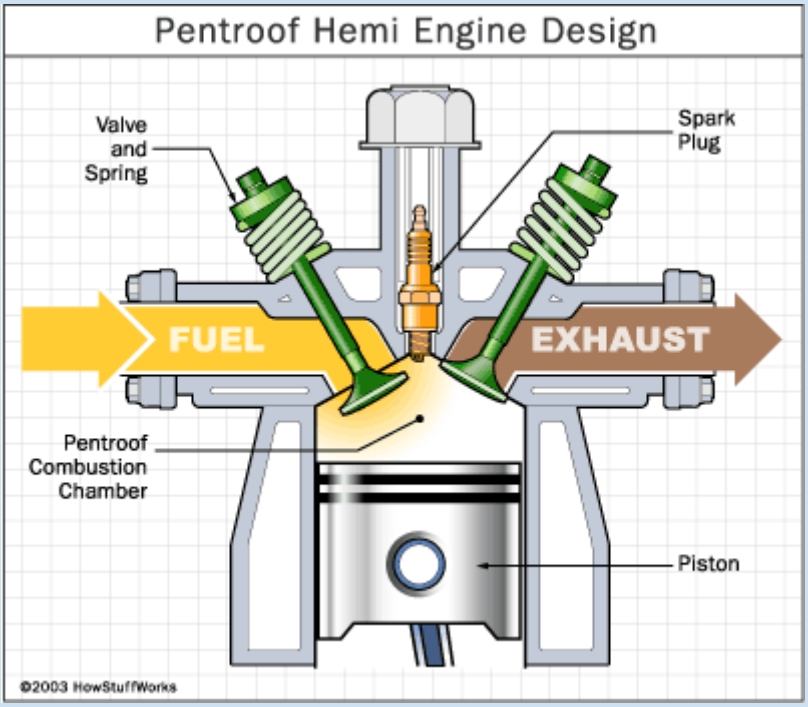
The 'Hem' Head surface area is much smaller than in a flat head, so less heat escapes and peak pressure can be higher and the larger surface area causes heat loss , fuel that is near the head walls may be so cool that it does not burn efficiently. With a flat head, the amount of surface area that is relative to the volume of the combustion chamber is large .



One thing that a 'hem' head will never have is four valves per cylinder. The valve angles would be so elaborate that the head would be nearly impossible to design.

For your average high performance street car, four slightly smaller valves let an engine breathe easier than two large valves . The Pentroof design is able to accommodate four valves

Small chambers further reduce the heat lost during combustion, and also shorten the distance the flame front must travel during combustion. The compact Pentroof design is helpful here too.



Acknowledgements: The Editor

Air Lubrication

I prefer to call this technology a 'bubble carpet' but it can be called air Lubrication or bubble lubrication, and is a new technology being developed in Japan.

The basic idea is to create a carpet of bubbles on the outside of the hull of the ship. This reduces friction with a consequent saving in fuel and greater frictional efficiency. Spin offs, if operating speed, stays the same. This would be environmental as less fuel would need to be burnt to maintain the same speed. This would result not only in a financial saving but also reduced NOX values. Hull infestation within limits is not an issue for those areas where air bubbles are in effect.

OK so what is it?

The idea is for the hull to ride on a carpet of air bubbles to reduce the frictional effect of driving through seawater. The bubbles themselves are created on the vessel and distributed onto the ships hull. Testing on a test ship has been conducted which resulted in a energy saving of 5%.

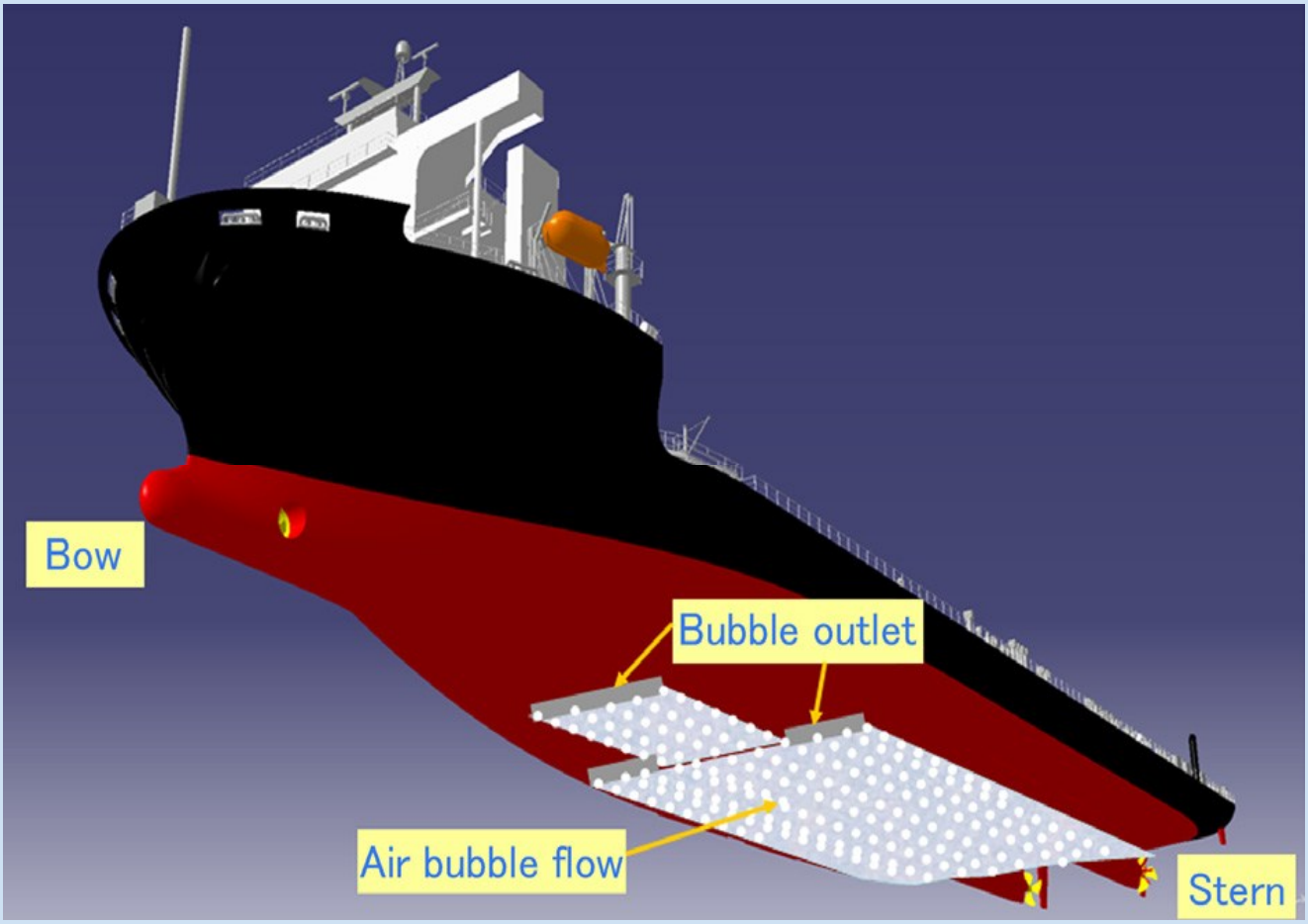
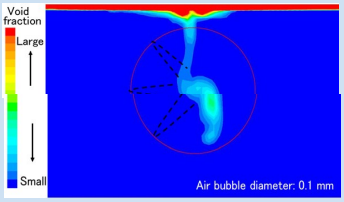


Fig 1

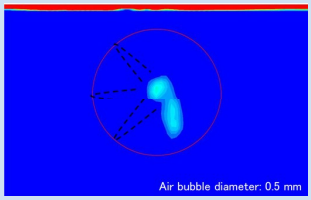
Presently experimentation is being confined to flat bottomed hulls with a 10% energy saving on a module carrier being achieved. (see above graphic). Bubble size is about 2—3 mm in diameter and the air outlets are situated fwd. creating a carpet aft of the outlet with bubbles being emitted at a constant flow rate. The effect of the bubbles on the propellers were evaluated and found to result in a slip of 0.4. The importance of the effect of bubbles on the propeller is obviously vital, so I will go into greater detail on this subject.

As the bubbles exit the hull via the stern, for a conventionally powered vessel with propellers in the standard fashion as in Fig 1, there will be what I call a 'inaction area' where there will be no thrust created by the movement of the propeller.

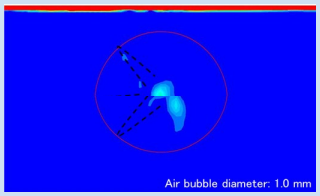
The below series of figures shows where in experimentation this inaction area is shown to be. This is the area affected through the propeller swept plane.



Air bubble diameter: 0.1 mm



Air bubble diameter: 0.5 mm



Air bubble diameter: 1.0 mm

Bubble Diameter .0.1.mm 030 % 0.5 mm 0. 017 % 1.0 mm 0.014%

The first thing of interest is that the bigger the air bubble, the smaller the affected area of the propellers swept plane as the bubbles exit the stern of the vessel.

The air bubble distribution on the hull surface of a ship with the amount of air bubbles flowing into the propeller were roughly predicted using a model. The results confirmed that the air bubble distribution on the ships bottom surface varied little in response to changes in the air bubble diameter. The experimental results were qualitatively similar to the air bubble distribution predicted by computer simulation.

It was confirmed that changes in the bubble diameter did not effect the peak position of the effected area on the propeller disk area, while the affected area of air bubbles flowing into the propeller increased as the air bubble diameter decreased. Comparison of the calculated and experimental results confirmed that the loss of propulsive efficiency due to air bubbles was negligible because the air bubbles flowed along the ship bottom toward the area above the propeller. However, the resistance reduction mechanism of the air lubrication method have not yet been thoroughly examined, including the causes and effects of changes in fluid density and the turbulence effects of air bubbles inside the boundary layer.

Experimentation is ongoing with particular emphasis on the effect of a bubble carpet on the propellers.

Acknowledgements: The Editor, Mitsubishi

Ask what SAIMENA can do for YOU, and what YOU can do for SAIMENA:

You are just starting out in your career as a Marine Engineer or Naval Architect. You love your job, and it takes up a lot of your life. However, when it comes to knowing anyone in the industry you find yourself restricted. Perhaps you have been in the industry for a while but haven't thought about joining SAIMENA, or are unaware of how much SAIMENA can benefit you, and how you can benefit SAIMENA. Perhaps, as you read this, you start to think of how many connections you have in your field of work and in doing so, realize that SAIMENA could benefit you into connecting, collaborating and discussing elements of the industry and how to improve it where it can count.

As for our current members, in our latest meeting it came to the attention of the council that although we have an impressive committee of superiors in the institute, we are lacking in the younger demographic sector who can bring new ideas, new insight and contribute to the ongoing consistent existence of quality and class within the SAIMENA community. SAIMENA's main objective is to add value, promote, and make suggestions on what is thought to be advantageous for the Marine Engineering and Naval Architecture industry as a collaborative whole in South Africa. In order to keep SAIMENA the best it can be, we need input, to collaborate, from the members who are a part of the branch and national committees, to the younger members who can bring a new energy. To utilize that input and collaboration and bring these new ideas to the table in order to enhance the individual and the institution. To merge the experienced with the energy of our junior members.

So, as a Marine Engineers or a Naval Architect who is not a part of SAIMENA and are in the industry, you are probably wondering, what is this SAIMENA exactly? What does it do and how does it benefit me? How can I benefit it?

WHY SAIMENA :

To quote from the constitution : "The South African Institute of Marine Engineers and Naval Architects was formed on 29th of November 1974 after a nationwide referendum indicated that a South African institute was desirable. All members of the Institute of Marine Engineers, London and of the Royal Institution of Naval Architects, London acquired similar grades of membership in the South African Institute."

WHY JOIN?

1.) A sense of belonging that a dedicated Sea Fairer/Marine Engineer or Naval Architect will be in a career for the rest of his/her life. When you are a part of such a fraternity, so you feel more inclusive in the Marine and Naval Architecture family.

2.) To connect, network. If you are not a member, if you don't go to these meetings, you can't expand your professional peer group. You have an opportunity to mix with the more experienced.

3.) If you are starting out in a career or have experience and are not a part of the committee, upon entering the committee you can get experience in how it actually works. This gives you management experience as well as public speaking experience. For any junior who is passionate about their work this is extremely beneficial and a great opportunity to get more involved.

4.) Should your cause be worthwhile, SAIMENA has many benefits and resources that can aid in your career and where you can contribute to the SAIMENA community. Not only do you grow in your career,

you build friendships, connections and insight into the Marine and Naval Architectural world. Being a part of such a community gives you access to opportunities you won't find outside the institution.

5.) Your time and how much of it you put into SAIMENA will be rewarded with benefits that you can only get through being a member and attending these social yet defining meetings. This includes tuition fees that may be payed for by SAIMENA to further your studies OR your next of kin's desire to have a career in Marine Engineering/ Naval Architecture. With SAIMENA we look after our own.

6.) To have your say and for that say to be acknowledged and discussed. New businesses as well as older businesses within the shipping industry demonstrate their products in some of the general meetings and as a member you can have your say on the advancement of the shipping material and businesses that are accepted or rejected within the shipping industry in South Africa.

WHY IT WILL BENEFIT THE OLD BOYS:

New ideas. Some 'new blood' to add further, modern ideas to SAIMENA.

With new Milleniial technology comes innovative thinking needed within the institute.

We need to bring the youth into the management of the institute. The present management need new blood.

For the Youth to tell us what they want the institute to be as they continue the legacy of the fraternity

To bring the institute into the progression of cutting edge technology and management.

In Conclusion, the importance of joining such a community not only brings personal fulfilment in the sense of belonging and connecting with peers, but you can add your input within the industry that you are a part of.

The council and committees discuss, review and collaborate certain amendments to the constitution, particularly to accord with changes in the structure of Professional Engineering.This is in terms of the Professional Engineers act and the STCW for Marine Engineers. You Network with companies at the branch meetings and AGMS. (Annual General Meetings) as well as with each other, discussing and observing emerging businesses within the industry as well as having your say and taking in what other professionals have to day.. To collaborate with the old ways and the new, from the experienced elite, in the marine engineer and the naval architect, to the people starting in this profession, that is what SAIMENA needs from you. That is what the industry needs from you in order for it to grow and fit the modern world. To not take away from the existing members, but to add to them.

In order to keep this prestigious institute going at its most advanced pace, in order to keep the standard going and fit the modern world and to keep it active, one needs 'new' blood. We need fresh young ideas and contributions to the institute. This way, we have all ideas from all age groups working together. It is a plus for everyone, and it is imperative in order for any fraternity to grow and keep its ranks. So, to the old boys who can think of a member or two who can add to our thriving community and to any marine engineer or naval architect who is not a member, ask yourself, what can I do for SAIMENA? and what can it do for me? If you haven't joined, what are you waiting for?

Acknowledgements: B Armstrong FB Administrator

The Need for ETO's

I wrote an article on ETO's in a 2016 edition of the Two Oceans Journal but did not indicate how you became one. This article is therefore concentrating on this aspect but first a brief history on how the ETO came into being:

Since ships first used electricity, even if only for lighting, it has been normal practice for shipping companies to employ electrical officers. The importance of the electrical officer became more and more evident if not vital as progress in ships machinery design involved more and more electrical machinery and equipment. Then of course when the diesel electric propulsion equipment was introduced the lecky was considered invaluable for that type of main propulsive power.

The strange thing about the carrying of an electrical officer on board a ship was it was never made compulsory. This, I believe, was due to the early historical duties of an electrician being easily carried out by an Engineer. It would not surprise me that any move to make the electrical officer obligatory were stymied by the shipowners fearing compulsory increased crew costs.

I sailed on an old ship with DC power with no electrician, and the electrics were very basic.

When the Radio Officer was made redundant due to advances in radio technology, this was initially greeted with enthusiasm by ship owners who failed to note or deigned to ignore, that the Radio officer also dealt with the repairs and maintenance of the bridge electronic equipment.

Eventually sense prevailed and the grades of ETO and ETR were created , because ships electric and electronic equipment is now so integral in the operation of a vessel that it could no longer be ignored.

You will note that I have referred to an ETO and an ETR so let me make a distinction between the two.

An ETO (Electro Technical Officer), arranges the competent and qualitative operation and maintenance of the electronics and control computer and info-communication systems on board ship in an operational and supportive role. In other words the ETO is trained and qualified to carry out the job of what the Radio Officer used to do with respect to maintenance of electronic equipment. In the modern era that mostly means navigational aids such as ECDIS, Radar, GPS etc. As radio comms is now a function of the navigation Officer, the ETO has no function in that respect but is required to possess a GMDSS operators license. The ETO also carries out the function of the ships electrician as before.

The ETR (Electro Technical Rating) is defined as one who assists and participates in the safe operation, maintenance and repair of electrical and electronic equipment and machinery in a supporting capacity on board a vessel, or performs related supporting functions on shore whereas the ETO (Electro Technical Officer), is defined as one who manages, controls and participates in the safe operation, maintenance and repair of electrical and electronic equipment and machinery in an operational capacity on board a vessel, or performs related supporting functions on shore.

From the above definitions it is safe to say the ETO controls and maintains with responsibility bridge electronic equipment as well as the remainder of the ship electrics including High Voltage. Whereas the ETR carries out the function of the previously known Electrical Officer under the auspices of the ETO.

There is no limit as to how many ETO's or ETR's a ship may carry so it is possible that some companies will carry at least one of each (such as on Ferries or Liners). What is more probable is that other types of vessels will require the existing Electricians to qualify as ETO's. Flag states will of course determine minimum requirements as per their Minimum Safe Manning requirements.

The required and dominant of the two grades is the ETO so I will lay down what they are required to be educated in and to have passed examination for, specifically in terms of their technical duties, and is assumed to have undergone an apprenticeship as an electrician prior to undergoing training as an ETO. Some if not many of these modules may be well known to those previously apprenticed.

1. The ETO arranges the competent and qualitative operation and maintenance of the electronics and control computer and info-communication systems on board ship in an operational and supportive role.

2. Understanding of elementary electronic principles, as they are applicable to electronic systems in the marine industry. With knowledge of electrical components and electronic equipment.

3. Knowledge and understanding of digital electronics.

4. Understanding the theory and application of control systems related, but not limited to, temperatures, pressure, level, viscosity, flow control, speed, torque control, voltage, current, machinery status (on/off), and equipment status (open/ closed).

5. Knowledge of high voltage systems.

6. To have Knowledge and be certificated to operate and possibly maintain GMDSS equipment .

7. Build an understanding of what it takes to skillfully and safely develop, engineer and service electrical and electronic equipment in the maritime environment.

The above are those purely electrical modules requiring schooling which are associated with quite a lot of sub modules. There are many more dealing with various shipboard operations such as fire fighting, oil pollution, garbage disposal etc. as well as various other subjects normally dealt with at Matric or during apprenticeship.

The list below deals with those items requiring practical skills:

a. Monitor the operation of electrical and electronic ship board systems

b. Manage the operation of generators and distribution systems for shipboard electricity reticulation

c. Manage the maintenance and repair of electrical and electronic equipment including monitoring systems, automatic control devices and protective or safety devices.

d. Manage the maintenance and repair of automation and control systems of the main propulsion and auxiliary machinery.

e. Maintain and repair bridge navigation equipment and ship communication systems as per Certificate of Competence endorsements.

f. Assist with the maintenance and repair of automation and control systems of the main propulsion and auxiliary machinery.

Bottom line is the ETO is the Chief electrician responsible for electronics and mainline electrics and the ETR is his junior assisting but not necessarily directly being supervised by the ETO. i.e. the Second Electrician.

So how does this fit into the existing manning arrangement? or more precisely who can be who?

As I see it one of the navigating or engineering officers can be trained as an ETR with the existing electrician being trained as the ETO or visa versa.

This might be a problem, but with a suitable inducement it's very possible and could be a lot cheaper than hiring an extra crew member. The sword hanging over the crew departments head is the MSM (minimum safe manning). Does flag state require an ETO or ETR to be on board, or are they happy having an electrician who is not certificated?

Will the Electrician at long last be **officially** recognised as an Engineer Officer?

Acknowledgements: OralPreps, The Editor

Tribology

Main equipment is a demanding environment to tribologists. While the machine elements and lubricants used are substantially the same as in other applications, some fundamental differences regarding the operating environment play a substantial role in their success.

Chief among these are the chemical nature of the fuels used, the operating temperatures achieved, and the speed ranges encountered. Also, a ship at sea may need to be totally self-sufficient for weeks at a time plus the engines are very big,

Small ships can use diesel motors of only a few horsepower compared to the ocean going monsters around today,

Very large thrust loads developed by propeller shafts must be efficiently transferred to the ship structure. Cams, gears, chains, journal bearings, pistons, rolling element bearings, etc., are all found in marine applications,

In the past few decades, diesel engines have exerted a dominance over other power sources in commercial ships and have displaced steam engines and steam and gas turbine engines to minor roles.

General fuel oil types and their viscosities as follows:

Bunker (marine) fuel oils: viscosities between 380 and 700 cSt at 50°C

Intermediate fuel oils: viscosities between 30 and 380 cSt at 50°C

Marine diesel oils: viscosities between 11 and 14 cSt at 40°C

Gas oil: viscosity less than 6 cSt at 40°C

The thicker fuels will not be easily pumped or atomized in the combustion chamber at ambient temperatures, and are therefore usually preheated to up to 130°C. The ideal is to achieve a viscosity of about 20 cSt.

Sulphur content in some fuels can be over 4%, leading to significant SO_2 and SO_3 combustion products, and a very acidic environment. Also, carbon particles can be suspended in the fuel, leading to fouling of cylinders and causing ring and piston sticking. In addition, abrasive particles are conveyed into the engine by the lubricant, so that abrasive wear rates are much higher than in other applications.

The base stocks used in the lubricants have seen a drastic change in recent years. While naphthenic oils were dominant in the late 20th century, paraffinic base oils and synthetics are now totally dominant in the industry, mainly due to the need for higher viscosity indices associated with high operating temperatures. Oils with Viscosity Indices in the 100 to 150 range are now in use.

The chemical considerations of the fuel are overcome by formulating lubricants with specific additives, both to compensate for the acidic nature of the fuel and combustion products and to aid in lubrication. Alkalinity is reported in terms of a total base number (TBN) of milligrams KOH per gram. The TBN of low-speed diesels is roughly 70; that of medium-speed diesel engines is roughly 30; and that of high-speed engines is about 5 TBN or so. Additives include the typical blend of boundary additives, extreme pressure additives, anti foams, detergents, etc.

Most of the harmful emissions from marine equipment arise from combustion products and contaminants, mostly Sulphur, in the fuels. While some lubricant is inevitably combusted, the major concerns about the lubricant itself involve disposal. Air pollution is mostly due to the chemical nature of the fuel oil used, but any changes in the fuel oil have far-reaching implications on lubricant formulation

Effect of Fuel Sulphur Content on SO_x Emissions and Fuel Costs

Fuel Sulphur Content (%)	Reduction in SOx Emissions (%)	Increase in Fuel Cost per Tonne ($)
3.5	5	15—30
3.0	10	_____
1.5	52	46 — 58

SOx emission rates as a function of fuel sulphur content, along with the increased cost of fuel.

It is entirely possible that Sulphur may in the future be removed from fuels through a costly refining process (dehydrosulphurization). An alternative approach is the treatment of exhaust gases, which will represent a fuel cost of about $25 per tonne with fuel consumption increased by 3%.

The implications of Sulphur reductions are very far reaching. If fuels were refined enough to eliminate most of the Sulphur content, then the need for increased alkalinity in the lubricant would be removed. In fact, lubricants would need to be reformulated, because Sulphur when present in small amounts is an extremely useful EP additive. Thus using fuels without Sulphur could actually lead to an increase in engine wear plus other functions (oxidation inhibition, detergency, etc.) aided by high alkalinity would need to be achieved with different lubricant additives.

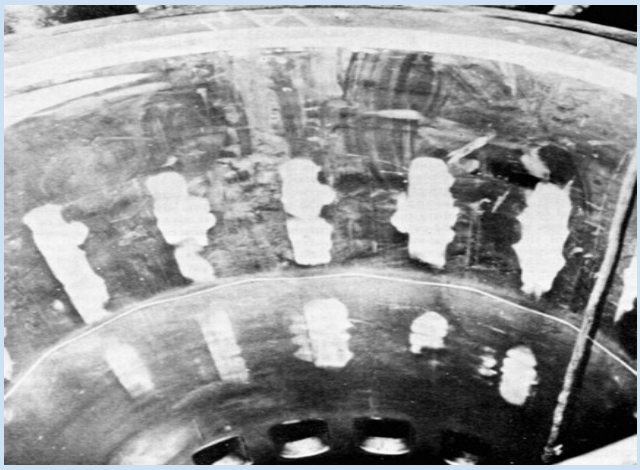
Nitrous oxide emissions are also a concern, and a number of approaches can be used to reduce NOx emissions. For example, NOx emissions can be reduced by 50% from uncontrolled levels by retarding fuel injection timing, but with a loss in specific fuel consumption of about 10%

Slow-Speed Diesel Engines (<250 rpm)

Cylinder lubrication is applied by cam-actuated reciprocating pumps through a number of ports or quills (usually 4 to 8) positioned around the cylinder liner. The cylinder oil must be thin enough to spread quickly, but must also allow formation of a hydrodynamic film at operating temperatures. Cylinder lubricants must ensure the desired viscosity at the cylinder liner operating temperature of around 200°C, with TBN values of 50 to 70. In addition, EP (extreme pressure}, additives and detergents are especially important for these lubricants.

Problems associated with lubrication arise from too low or too high an application rate. Over lubrication can cause fouling of the cylinder or can even cause post-cylinder fires in the engine, especially the turbocharger. Further, over lubrication adds significantly to maintenance cost

Too low am application rate, means the alkaline nature of the lubricant is neutralized before it spreads over the entire cylinder resulting in the oil applied just below the quill that will neutralize the sulphuric acid but will become increasingly ineffective as the distance from the quill increases. This leads to classic periodic wear patterns on cylinder liners called "clover leafing," where significant corrosion, fatigue wear and corrosion-assisted abrasive wear occurs between quills, but almost none occurs near the quills.



Severe clover leafing on a chrome-plated cylinder liner

The level of alkalinity required depends primarily on the fuel's Sulphur content. If the Sulphur content is in the 2 to 3% range, then a TBN of 60 or so is sufficient. High-performance lubricants, which operate successfully for fuels with over 3% Sulphur, can have TBN values of 70 or more.

Crankcase Lubrication

A chief concern with low-speed diesel engines is the isolation of crankcase and cylinder oils, although some migration of oils through the piston rod diaphragm is inevitable. This can introduce cylinder liner wear debris as well as acid combustion products. Seawater contamination is also a concern. All of these contaminants can facilitate corrosion and rusting of journal bearings and white metals, and require special lubricant formulation to obtain good product life.

Three crankcase oil types are used in marine service

• Rust and oxidation oil types (for older engine designs)

• Low alkalinity (TBN = 4–6) for water-cooled piston engines

• Medium alkalinity (TBN = 8–12) for oil-cooled piston engines or when a water-cooled piston engine uses the same oil for main and oil -cooled auxiliary engines

White metal babbits (tin-based alloys) are commonly used as a bearing material in slow-speed engines. Saltwater contamination can allow galvanic corrosion of the tin, forming a black oxide layer. This layer can cause increased interference between bearing and journal, and can also flake off, resulting in a three-body wear condition. The obvious solution is to prevent seawater contamination, but when this is not practicable, effective demulsifiers are essential.

Lubricants flowing through the engine will collect contaminants and combustion by-products. Ideally, the oil would be discarded after one pass through the engine, but this is obviously a wasteful and expensive proposition. Instead, effective detergent additives are included in the lubricant formulation to prevent fouling of machine elements by these contaminants. Large ships typically have equipment to centrifugally water separate, filter, and condition lubricants.

Medium-Speed Diesel Engines (250 to 1000 rpm)

Usually four-stroke engines have a slightly higher power-to-weight ratio than slow-speed diesel engines. They are commonly used for ferries, small container ships, and cruise ships

High-Speed Diesel Engines (>1000 rpm)

For these engines, only the highest quality distillate fuels are used, and heavy duty automotive type diesel oils are used as lubricants.

Ancillary Equipment

Stern Tube

Use higher weight oils to reduce oil leakage. For example, one manufacturer recommends oil up to 275 cSt at 40°C to minimize seal wear from sand, mud etc. held in suspension when in shallow waters.

Deck Gear

Deck gear having gearboxes require a good quality gear oil

Pumps

Pumps are used to move ballast water, transport fuel, circulate engine coolant, and transfer liquid cargoes. Centrifugal pumps operate at high speed and usually do not use a gear reducer. These use light turbine oils as lubricants and grease-packed bearings. Positive displacement pumps operate at lower speeds and use a gear reducer, which requires a good-quality gear oil. Often, lubrication is performed by the fluid being pumped.

Acknowledgements: The Editor

News Snippets

1. Shipboard Autonomous Fire Fighting Robot (SAFFiR), developed by Naval Research Laboratory in collaboration with Virginia Tech and other US universities, is an autonomous humanoid robot capable of detecting and suppressing shipboard fires and working shoulder to shoulder with human firefighters using advanced sensors. The idea is not to replace humans in firefighting but to aid them in firefighting operations on ships. In the case of fire on ships, these robots would perform tasks such as turning valves, picking up and dragging fire hoses, and putting water on fire. This concept can make use of different fire suppression technologies including PEAT grenade. The firefighting robot has a vision system to search for survivors and can withstand heat up to 500 degree Celsius. It is also outfitted with multi-modal sensor technology for advanced navigation to overcome obstacles and stay upright even in pitching and rolling sea conditions. The robots can respond to gesture and commands, and its sensor package includes a camera and gas sensor. IR and UV camera help it to see through the smoke and detect the source of excess heat respectively.

2. The build-up of marine organisms on ship's hull, also called bio-fouling, reduces the ship's speed by up to 10%. To compensate the drag, it is said that, a ship may have to use about 40% more fuel. Sometimes, toxic coatings are applied to prevent bio-fouling but they pose threat to marine ecology. An innovative hull cleaning robot namely "HullBUG" has been developed by SeaRobotics and funded by U.S. Navy Office of Naval Research (ONR) to tackle this issue. The Robotic Hull Bio-inspired Underwater Grooming tool (Hull BUG), is a small autonomous vehicle weighing 30 to 40 kg. It uses four wheels and attaches itself to the underside of ships, using a negative pressure device that creates a vortex between the BUG and the hull. It crawls on the hull surface and performs frequent grooming (light cleaning of fouling films). Sensors provide obstacle avoidance, path cleaning, and navigational capabilities. A fluorometer lets the robot detect biofilm and then it uses rotary brushes or water-jets to scrub the fouling film off.

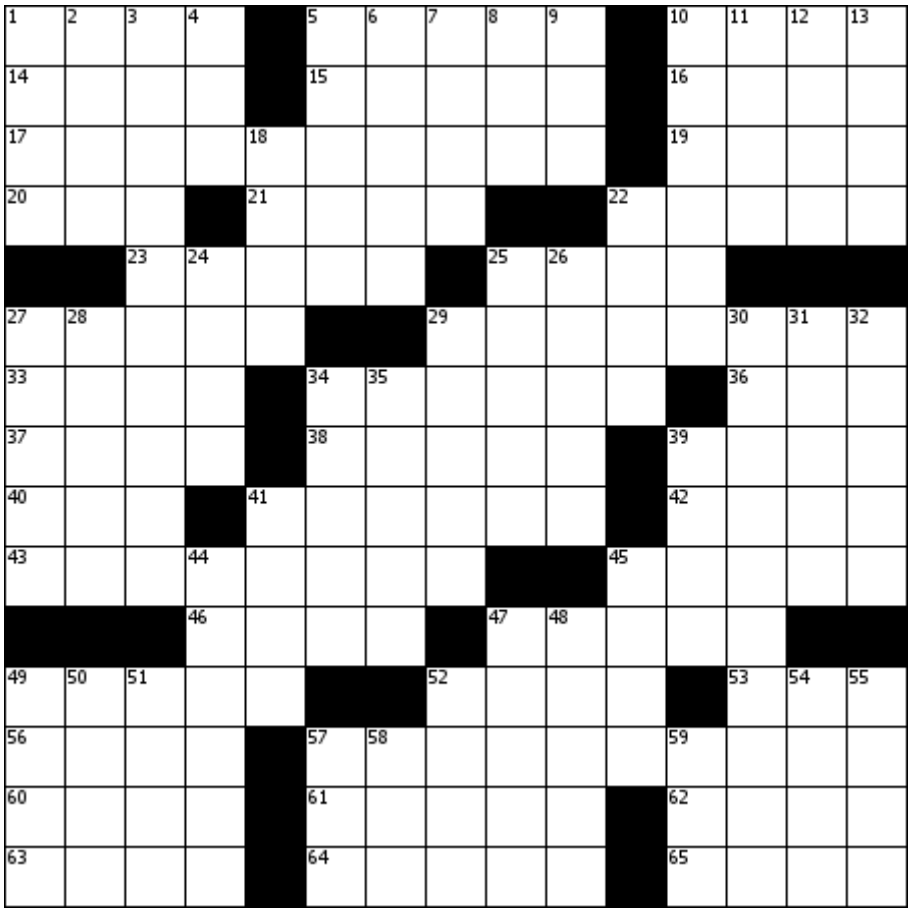
3. Traditionally, inspection of huge cargo ships for cracks, corrosion or any wear to ensure that they comply with rising safety standards is a time-consuming task for surveyors. Moreover, they have to risk their own safety to climb every nook and cranny of the vessel themselves. Ship Inspection robots is a robotic technology which can help in this process and also save time and money for owners, improving the accuracy and quality of these important inspections.. A student team from ETH Zürich and ZHdK in conjunction with Alstom Inspection Robotics has developed a lightweight and low-cost Ship Inspecting Robot (SIR). Its prototype is capable of conducting a visual inspection of ballast tanks and hard to reach parts in huge cargo vessels. Its four magnetic wheels and overlapping wheelbase enable SIR to navigate the I-beams and other awkward obstacles found inside ship ballast. These robots can be controlled via a wireless transmitter with live video feed and its four infrared distance sensors help in detecting edges and obstacles.

4. Recently, Rolls-Royce put forth the designs of unmanned remote controlled cargo ships. Though some experts are doubting the idea to convert into reality, the manufacturer claims to do so within a decade using modern technologies. The world's first remote-controlled unmanned cargo ship by Rolls-Royce is a concept which revolves around a no-crew ship that can be controlled from the shore. A research project called MUNIN – Maritime Unmanned Navigation through Intelligence in Networks supported by the European Commissions, aims at developing and testing this autonomous ship concept. Moreover, a robotic unmanned surface vehicle (USV) has been developed by US Navy to sweep across the ocean to detect mines using magnetic and acoustic technologies namely Unmanned Influence Sweep System (UISS). UISS is expected to hit a fleet of US Navy till 2017. Unmanned robotic vessels can help to fight piracy as well for which researches are going on.

TOJ Crossword

Across

- **1**. Ice formation
- **5**. Skiing hill
- **10**. Exported
- **14**. Cookie cooker
- **15**. Thin candle
- **16**. Unrefined metals
- **17**. Heal
- **19**. Desk light
- **20**. Be mistaken
- **21**. British nobleman
- **22**. Coins from Mexico
- **23**. Ahead of time
- **25**. Slender
- **27**. Sacred song
- **29**. Every two years
- **33**. Passenger vehicle
- **34**. Garment part
- **36**. Gun rights group (abbr.)
- **37**. Englishman, informally
- **38**. Throw
- **39**. Rewrite text
- **40**. MGM lion
- **41**. Pencil rubber
- **42**. Pretense
- **43**. Decoration
- **45**. Tightwad
- **46**. Pot covers
- **47**. Upright
- **49**. Rented again
- **52**. Pub beverages
- **53**. ____ Grande
- **56**. Perfume
- **57**. What a priest hears
- **60**. Bog product
- **61**. Up to the time of
- **62**. Breathe quickly
- **63**. Outcomes
- **64**. Young people
- **65**. Furthermore



Down

- **1**. Tedious person
- **2**. Constantly
- **3**. Fun and games
- **4**. African antelope
- **5**. Burglarize
- **6**. Host ____ King
- **7**. October's stone
- **8**. Domestic animal
- **9**. Byron's "before"
- **10**. Serious
- **11**. Historic times
- **12**. Movie fish
- **13**. Recipe abbr.
- **18**. Salon treatment
- **22**. Evergreen tree
- **24**. Very much (2 wds.)
- **25**. Strainer
- **26**. Crowbar, for one
- **27**. Artist ____ Picasso
- **28**. More certain
- **29**. Wild animal
- **30**. ____ revolution
- **31**. Get up
- **32**. In a while
- **34**. Fragment
- **35**. Slants
- **39**. Clapton or Idle
- **41**. Send out
- **44**. Warnings
- **45**. Army meal
- **47**. Like Santa's helpers
- **48**. Staggers
- **49**. Lasso
- **50**. Genesis site
- **51**. Cargo
- **52**. Opening bet
- **54**. Charged particles
- **55**. Informed of
- **57**. Snip
- **58**. Wallet bill
- **59**. Health farm

PERFORMANCE CURVES

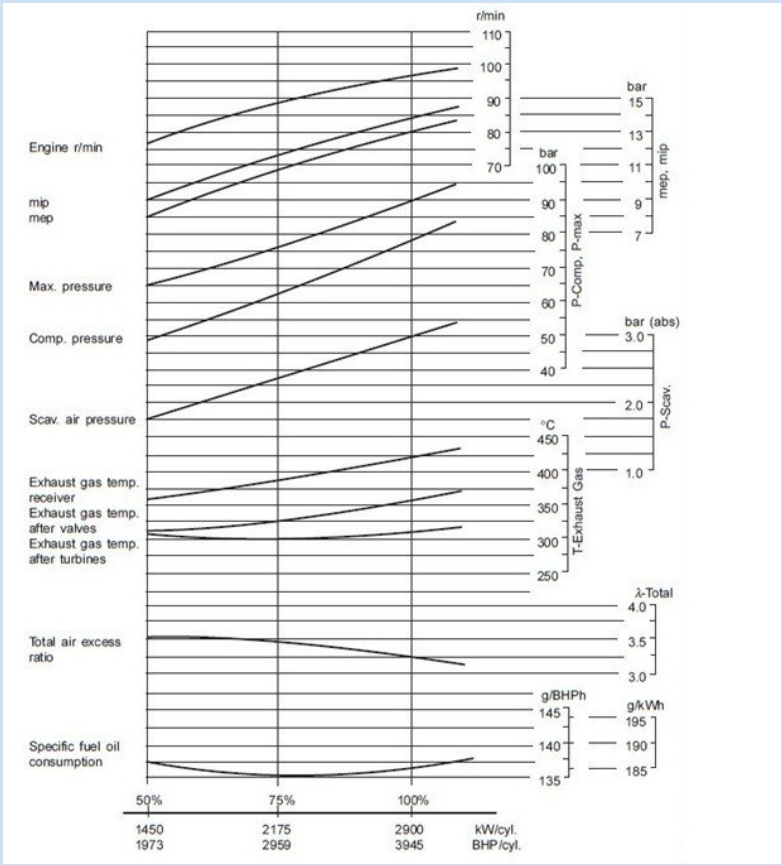
- **Engine RPM vs. Load**: This curve helps in ascertaining whether main engine is overloaded or not. A higher power generated at a lower RPM indicates an over loaded main engine.
- **Mean effective pressure vs. Load**: Mean effective pressure is used to calculate horse power hence these two values should co-relate. In case they don't then there may be some error in calculation or instrumentation.
- **Maximum pressure vs. Load**: This curve helps in knowing the condition of fuel injection equipment, injection timing and the compression in the cylinder etc.

Compression pressure vs. Load: This curve indicates the condition of the parts maintaining compression like piston, piston rings and exhaust valves.

- **Scavenge air pressure vs. Load**: It indicates the condition of the turbocharger and associated equipment.

- **Exhaust gas temperature in receiver vs. Load**: It indicates the enthalpy of the exhaust gas prior to entry in turbocharger. This value compared with the value after the turbocharger gives the temperature drop across the turbocharger, is an indicator of turbocharger efficiency.

- **Exhaust gas temperature after exhaust valve vs. Load**: This curve sheds light on the combustion, fuel injection, timing and compression etc. A higher temperature may be caused due to after burning.
- **Exhaust gas temperature after turbocharger vs. Load**: This curve is very useful as it indicates the enthalpy captured from the exhaust by the turbocharger and hence its condition. In case the receiver temperature is within range but the outlet temperature is higher it may indicate fouling of the turbocharger and hence the associated lower scavenge air pressure and high exhaust gas temperature.
- **Total excess air ratio vs. Load**: This curve is scarcely used by ship staff and is useful for design engineers. This curve sheds light on scavenging and the turbocharger capacity and condition. It shows that as the power increases the excess air decreases due to consumption.
- **Specific fuel oil consumption vs. Load:** This curve helps to counter check whether the engine is consuming fuel oil correctly as per the load.



Acknowledgements: The Editor

Marine Diesel Engines How Efficient can a Two-Stroke Engine be?

One of the future goals in the marine industry is to reduce the impact of CO2 emissions from ships in order to meet the coming stricter International Maritime Organization (IMO) greenhouse gas emission requirements. Two CO2 emission indexes are being discussed at IMO, an 'Energy efficiency Design Index' (EEDI) and an 'Energy Efficiency Operational Indicator' (EEOI).

The EEDI is used to evaluate the engine and vessel design and the EEOI is used to guide the operator in developing the best practices on board. The goal is to design future ships with a design index to be stepwise reduced in the period from 2012 to 2018 to a maximum level of possibly 70% compared with the 100% design index valid for average designed ships of today. However, it should be emphasized that neither goal nor indexes are definite as of June 2009.

As a reduction in CO2 emission is roughly equivalent to a reduction in fuel consumption, the goal for the manufacturers will roughly correspond to a 30% reduction in fuel consumption per voyage of future ships in normal, average service.

CO2 caused by shipping amounts to only 4% of the global scale load. In addition, shipping, in terms of transporting one ton of cargo one mile, has the lowest CO2 emission compared to all conventional forms of transportation. These values also apply to the fuel consumption and the levels of other pollutants. Nevertheless, shipping can further contribute to improving efficiency, and reducing emissions.

The pollutants in the exhaust gas of two stroke marine engines consist predominantly of:

1. Carbon Dioxide (CO2), which is reduced by improving the overall efficiency of the engine, and thus fuel consumption. This also includes improvements in: a. Mechanical efficiency b. Thermal efficiency
2. Nitrogen Oxides (NOx), which are formed during combustion, and can be reduced by the following methods:

   a. Regulation of the fuel injection (rate shaping)

   b. Water in Fuel emulsion (WIF)

   c Humidification of the scavenge air (Scavenge Air Moistening - SAM)

   d. Exhaust Gas Recirculation (EGR) e. Selective Catalytic Reduction (SCR)

3 Sulphur Dioxide (SO2), which can be reduced by low-sulphur fuel, or scrubbing processes.

4 Particulate Matter (PM), caused by nucleation and subsequent agglomeration of Carbon during combustion of Heavy Fuel Oil or Marine Diesel. Removal of PM can be achieved by particle filters or scrubbing processes.

Improving the overall efficiency of the two stroke marine engine

In general, the larger the propeller diameter, the higher the propeller efficiency and the lower the optimum propeller speed. Referring to an optimum ratio of the propeller pitch and propeller diameter, the corresponding propeller speed will be reduced and the efficiency will also be slightly reduced, when increasing the propeller pitch, depending on the degree of the changed pitch. The same is valid for a reduced pitch, but here the propeller speed will increase. Thus as low as possible a propeller speed (within design restrictions of the ship) is desirable, but some tuning can be done without significantly affecting the propulsion efficiency. This is important to always consider as a starting point, to match the requirements for propeller speed of the particular vessel in direct drive configurations. :

The efficiency of a two-stroke main engine depends particularly on the ratio of the maximum (firing) pressure and the mean effective pressure. The higher the ratio, the higher the engine efficiency.(i.e. the lower the Specific Fuel Oil Consumption (SFOC).) Furthermore, the larger the stroke/bore ratio of a two-stroke engine, the higher the engine efficiency. This means, for example, that a super long-stroke engine type will have an even higher efficiency compared with a short-stroke engine type.

Compared with a camshaft (mechanically) controlled engine, an electronically controlled engine has more parameters which can be adjusted during the engine operation in service. This means that the ME/ME-C engine types, compared with the MC/ MC-C engine types, have relatively higher engine efficiency under low NOx IMO Tier II operation.

When the design ship speed is reduced, the corresponding propulsion power and propeller speed will also be reduced, which again may have an influence on the above-described propeller and main engine parameters. The following is a summary of the major parameters described:

Propeller

Larger propeller diameter involving:

o Higher propeller efficiency
o Lower optimum propeller speed (rpm)

Lower number of propeller blades involving:

o Slightly higher propeller efficiency
o Increased optimum propeller speed (rpm) (from 6 to 5 blades means approximately 10% higher rpm)

Main engine

Increased p_{max}/p_{mep} pressure ratio involving:

o Higher engine efficiency (e.g. by derating)

Larger stroke/bore ratio involving:

o Higher engine efficiency (e.g. S-type engines have higher efficiency compared with K-type engines)

Use of electronically controlled engine instead of camshaft controlled:

o Higher engine efficiency (improved control of NOx emissions)

Ship with reduced design ship speed

Lower propulsion power demand and lower propeller speed.

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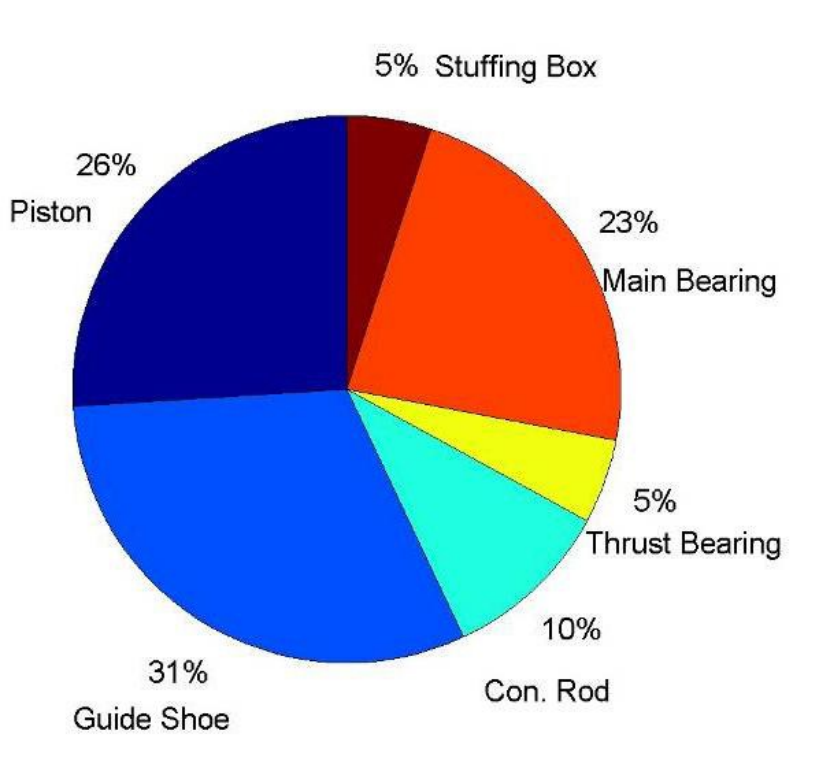
Improving the Mechanical Efficiency of the Two Stroke Marine Engine

The key issue in improving the mechanical efficiency of the engine is reducing friction on all moving parts. As shown below, the dominating causes for frictional losses are the piston ring package and the guide shoe bearing. Implementation of low friction guide shoe bearings could ,in turn, reduce friction by a further 20%.



FRICTIONAL LOSSES

Improving the Thermal Efficiency of the Two Stroke Marine Engine

Various techniques & technologies can be applied to the modern day two stroke marine engine in order to improve the thermal efficiency:

A. Auto-tuning; is a control technique that can be applied to the engine to maintain optimal operating conditions dur-ing operation. This is achieved by increasing the individual maximum cylinder pressures (Pmax) so that they are closer to the limit specified for the engine. Thereby achieving a potential gain in Pmax of 5-10 bar on an average maintained engine. A 5-10 bar gain in Pmax can give up to 1-2 g/kWh reduction in fuel consumption.

B. Low load operation (reduction of ship speed); can be set up in electronically controlled engines, whereby an optional 'Low load' running mode, will optimise the engine to run at a lower engine load, thus giving a further reduction in SFOC of 1-2 g/kWh. In addition to the SFOC reduction, a slower sailing speed will also significantly reduce fuel consumption, for example a reduction from 25 knots to 20 knots will result in only a 40-50% propulsion power requirement.

C. Turbocharger cut-out; provides the possibility to cut-out a turbocharger when running at lower loads, and thereby reduce SFOC by up to 5g/kWh.

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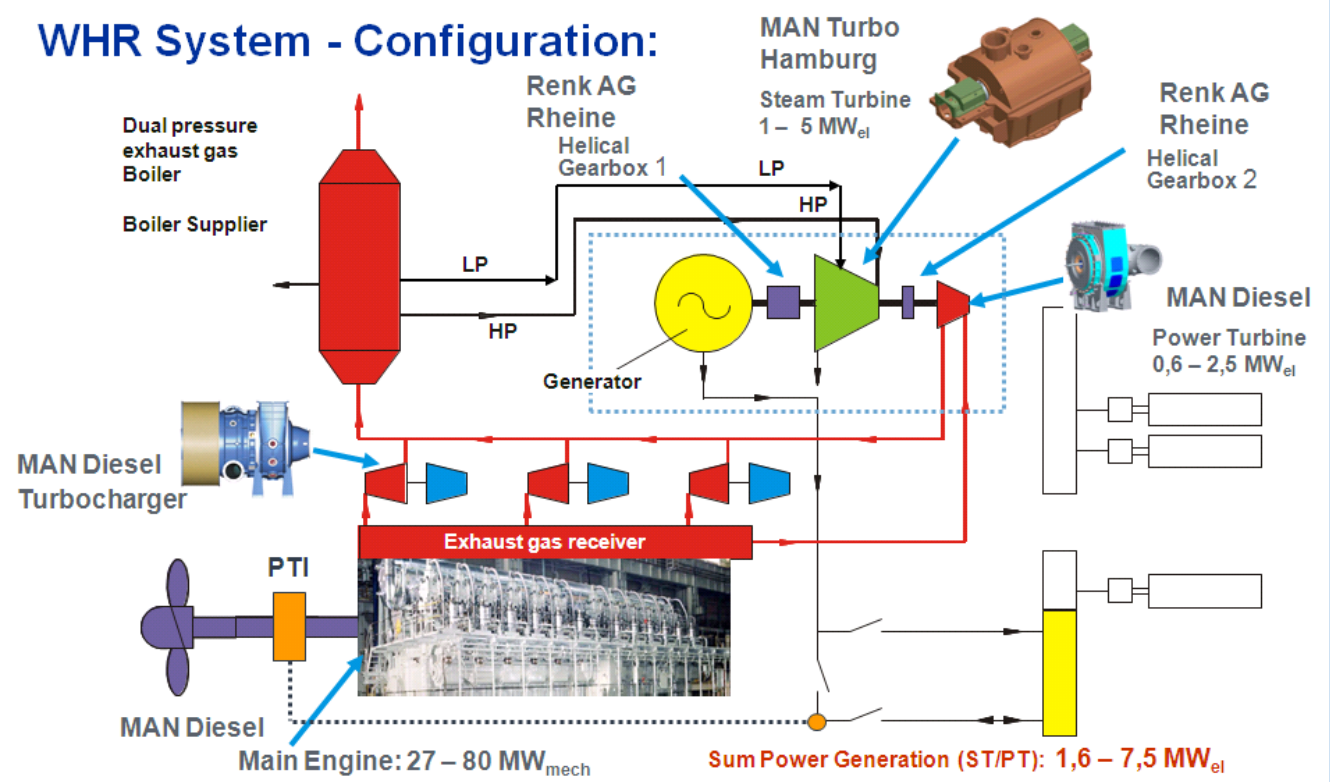
D. Variable Turbine Area turbocharger; allows for dynamic load optimisation of the engine, by adapting scavenge air delivery to demand continuously, at all engine loads and speeds. This reduces fuel consumption up by up to

3 g/kWh.

E. Waste Heat Recovery (WHR); exploits the heat lost in the exhaust gasses, and converts it into electricity for use on board the vessel, thereby reducing fuel consumption for auxiliary engines by up to 10%.



Acknowledgements: MAN

Safmarine Ships

A lot of our members are ex seafarers who sailed on the many Safmarine ships over the decades. I thought you would like a series highlighting SAF ships in each edition of the TOJ. Do you have any interesting stories to tell when you sailed with SAF?

If so, please send it to me at my email address of iainfran1@gmail.com and I will include your story in the TOJ.

My first ships are :

S A Hexrivier (Built 1967) (GT 6320)

One of three refrigerated motor ships built for the export of frozen fruit from South Africa to the UK and Europe. They were built in Dutch yards and entered service in early to the mid-1960s. This class of ships were the first SAF ships to be powered by diesel engines, fitted with an eight cylinder M.A.N K8Z70/120 low speed two stroke diesel engine developing approx. 9,600 BHP and a speed of 17 knots. For electrical power four MAN diesel engines drove AC alternators . Previous name “Mistral Universal”

S A. Winterburg (Built 1978) (GT 52615)

Can’t find much about this ship except that she was on the SA – Europe and the Far East –SA Route. She was one of a quartet of sister ships, and one of the original big whites . She has since been scrapped after being sold first to Maersk , then to MC Shipping and finally to Danaos Shipping .

Survey Results

The National Council of SAIMENA is always concerned about what the Institute can do for its members, and with that in mind a survey was conducted online addressed to all members . The average reply was in the region of 25% of the members of all grades, the results of which are as follows.:

The questions in order were:

1.**Are you a privately paying or company sponsored member?** Out of 112 responses 83 said they paid privately and the comments were few but generally no objection to paying the annual fee on a private basis. Some comments were made that they did not pay fees as was their right under the constitution and others said they don't have to pay but do anyway.

2. **Membership Fees?** Out of 112 responses the vast majority (89%) considered the annual fee to be reasonable.. The comments were variable with most comments considering the fees to be too low.

3. **Have you used the SAIMENA website?** Out of 112 responses it was virtually 50/50. Comments were in the majority that the site is not or rarely being used.

4. **Is the information available on the website sufficient?** Out of 76 responses 75% said it was sufficient but the comments made it very clear that our members are not using the site at all, or very rarely.

5. How would you like SAIMENA to contact you? Out of 110 responses, just under 94% made it clear that e mail is the way to go. Comments were few but it was raised that face book and whatsapp are an alternative or additional means .

6. **Why do you NOT attend meetings? (DURBAN).** Out of a response of 82 persons, it was very obvious that location of meetings is a problem in Durban. Most of the comments were that they had other commitments or did not live near Durban proper.

7. **Why do you NOT attend meetings? (CAPE TOWN)** Out of a response of 78 persons the answers mirrored the Durban ones.

8. **What time of the month would you like the presentation?** Out of 108 responses by far the most are not concerned about what day or week the presentations are held.

9. **What time would you like the presentation?** Out of 100 responses , 78 preferred the evenings although a significant 22 said lunchtime. Comments were mostly in favour of evening meetings , with the odd one or two not fussed.

10. **Reason for membership?** Out of 107 responses, 68 said "to gain professional knowledge. Other choices were well represented with 17 responses saying it was career beneficial to them, 2 saying because their company pays the fees., 8 to attend social gatherings. Comments varied but the most common one was because the member just wanted to part of the Institute.

11. **Are you aware of things SAIMENA can do for you? (Guidance, Mentoring etc).** Out of 107 responses the opinion was very split down the middle with 56 saying "yes" and the remaining 51 saying "no". Comments, although few made it clear that clarification on this issue is needed..

12. **What would you like to get out of SAIMENA?** All the answers to this question were comments of which there are 67. The comments were mostly for social wants and a number for knowledge/development and contacts.

Now I am no Psychiatrist, but looking through the results and taking the comments into account, the following is apparent as to what both Branch and National councils should be trying to address.

A. **The website**: The site does appear to need modifying. I know those well up in I.T. will say " but it is easy", but this may not be so to a lot of our members. Indeed the survey shows that that just about half of our membership are not using it or don't rely on it as info is outdated or difficult to obtain. For instance, to read this magazine on the site you have to place the icon on the "news" text, then on TOJ, but if you don't know that, it's a case of press and guess. So some adaption and modernization is perhaps required, along with a newsletter by post to all , explaining how to use it and what it contains.

B. **Attendance at Meetings**: It is very clear that meeting attendances and places are a moot point and is common to Cape Town and Durban. Not too sure about Durban, but in Cape Town membership is divided up into those who live in the Northern suburbs and those in the south. I suspect there might be a similar divide in Durban. With the demise of SAIMENA House, that dealt a blow to Durban and relying on companies and other organisations to supply venues is demeaning and always a problem. The distance between say Simonstown and Granger Bay is large, as is the distance between the Port of Durban and say Westville. The Branches try to stay neutral, having their respective meetings close to town, but the ideal would be to have a permanent meeting place controlled by SAIMENA at both branches. This was ideally found with SAIMENA House for Durban, and perhaps something more half way than what is presently being used is more fit for purpose. The same could be said for Cape Town.

C. Member Aspirations for SAIMENA: With a clear 50/50 split on "do members know what SAIMENA can do for them", read with the comments of "what do you get out of SAIMENA", the link with the web site as in **A.** above becomes very clear. But there appears to be a distinct opinion that some members are unaware of SAIMENA's offerings. An example is, do ECSA certified members know that CPD points are awarded for attending SAIMENA meetings. Also with approved representation, SAIMENA will assist in study grants for students. There are many more areas it is advantageous to be a SAIMENA member (student, associate, or corporate), such as job opportunities etc. How many know that SAIMENA in the area of social responsibility make a grant annually to the NSRI, and to the Lawhill Maritime school. If all these good things could be clearly displayed on the website and given out in a posted newsletter, a lot of us would, I am sure, be even more proud of our Institute and what it does for its members and for society.

The opinions above are just that, opinions. What do you think?

Drop me a line on iainfran1@gmail.com and let's get a discussion going.

Acknowledgements: The Editor

If you want to be successful tomorrow, you must be teachable today.

Bravo Zulu

Marine Engineer and Electrotechnical Officer

ORIGINAL

POP-503

South African Maritime Safety Authority

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Duration	Three Days
Maximum number of candidates	Twenty Five (25)
Approved Assessors	Mr H Van Niekerk, Mr P G L Wood, Mr A Rice
Approved Facilitators	Mr H Van Niekerk, Mr P G L Wood, Mr A Rice, Mr J M Adams

SOUTH AFRICAN MARITIME SAFETY AUTHORITY 28 MAR 2018 DURBAN

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Date of issue	28 March 2018	Accreditation valid from:	12 May 2017
Senior Examiner	Werner Krisch	Accreditation valid to:	11 May 2020
Senior Examiner's Signature			

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2. STEM Skills Gap Analysis.

3. SAMSA Oral Preparation.

4. Practical Marine Electrical Knowledge.

5. Navigation Electronics (Bridge Electronics).

6. Power Electronics (Engine Room).

7. Marine Engineering Knowledge.

8. Naval Architecture

9 Maritime Law

oralpreps@gmail.com

Notice to Advertisers

As you may have noticed, TOJ carries an advertisement in this electronic edition .

After consultation, the SAIMENA Council approved a request to accept paid advertising, and agreed to continue accepting adverts on a regular basis.

The TOJ circulation list is essentially our individual membership, and we are aware that companies do make it into the hands of our friends and colleagues. Adverts are accepted on the basis that the interests of our members are served by highlighting goods or services which are relevant to our respective disciplines.

TOJ will accept advertising at R 500 per page per edition, and two editions per year are planned but this could go to three.

TOJ is our Institute's magazine, and while the advertising is a welcome and unexpected contribution, we may need to limit the number of pages set aside for advertising in any one edition to maintain the essence of our little publication.

We look forward to developing some new relationships!

Kind Regards,

The Editors