The South African Institute of Marine Engineers and Naval Architects

SAIMENA

The Two Oceans Journal

1st Edition 2022

National Council 2021/2022

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CONTENTS

Page No's

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2022 1st Edition

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

President's report

My best wishes to all SAIMENA members and associates reading this edition of our Two Oceans Journal, the first edition for 2022.

The past year of 2021 has felt as if it has flown by and nothing concrete was achieved, but if you read further down you will see that SAIMENA has not been dormant at all.

During 2021 covid impacted heavily on stopping Branch meetings and activities and effectively there were no meeting held apart from limited online communication. Let us hope that we normalise this during 2022 and can get developmental activities going again.

A Special General Meeting was held online in August 2021 to introduce important new clauses into the SAIMENA Constitution, this enabled SAIMENA to formally register as a Non-Profit Organisation (Approved in November as NPO 267-620).

SAIMENA had 9 new members in 2021 and 2 so far in 2022, with a number of existing members (4) revising their member grades. I request all members to review their changed circumstances and apply to revise their member grade where they can according to the SAIMENA Constitution (ie new qualifications, years of experience or professional registration).

Unfortunately we had a number of resignations and had to suspend some members due to fees not being paid. We also suspended a lot of student members because they had not kept contact with SAIMENA and we could not trace them; a few did engage SAIMENA afterwards and upgrade to full members.

SAIMENA currently has 383 members of various grades of which 140 are registered with ECSA.

The SAIMENA Council and the Branch Committees have had little activity over the last year due to the ongoing restrictions; although I'm pleased see that the Durban Branch managed to get in a Branch lunch before restrictions tightened again. Please support your Branch committees as the new business year starts, if you want SAIMENA to progress and influence the status of maritime affairs in South Africa then get active and voice your opinion by participation in your Branch Committee.

We still have some SAIMENA members who are not in email contact with us, please encourage all your shipmates to ensure that the make electronic contact with SAIMENA to ensure that we can deliver on-time and relevant contact with our members, the use of the postal system is very expensive and highly unreliable. Many members also fail to update their details resulting in a breakdown of contact, please keep SAIMENA up to date so that we can be of service to you our members.

SAIMENA in co-operation with industry partners (Engineering News/International Zinc Association Africa, Maritime Review Africa, CSIR program AISI, AMSOL) promoted 8 online webinar events which would give attendees a total of 1.3 ECSA CPD points; not a bad way to get your annual CPD points for free!

Some SAIMENA members and a handful of non-members made active inputs to the various segments of the new work being done on the Oceans Economy Master Plan. The segments focused on were Shipbuilding and Repairs, Maritime Engineering and Design, Skills development and Technology and R&D. While it may feel repetitive to make inputs to repeat what was done for the 2014 work of Operation Phakisa, I feel it was vital to make the new inputs to ensure that the marine industry can give feedback and lessons learnt from that earlier period, especially as SAIMENA was not formally involved in Operation Phakisa (although some individual members may have taken part). My great thanks to those members who contributed and put in the effort to ensure that an alternative and rational industry opinion was raised against the institution position.

SAIMENA has also renewed our Co-Operation Agreement with the Royal Institution of Naval Architects (RINA). The co-operation with RINA will allow for the exchange of technical information and knowledge on marine engineering matters between these two professional bodies who are devoted to the promotion of the art and science of naval architecture and maritime technology in our respective countries and re-enforces the objectives of SAIMENA to foster and enhance the professionalism and standing of the maritime engineering profession in South Africa

I would like to review the Strategic Focus Areas we set for 2021

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

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

SAIMENA made some progress in providing 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. Unfortunately no progress was made on the Maritime Engineering recognition front.

The was no progress made in the intent to grow student and junior member numbers to join SAIMENA and become active participants in SAIMENA affairs. Let us try again in 2022.

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 in enhancing and growing maritime engineering in South Africa.

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

Other Matters

I 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 first IPV has been seen doing sea trials off Cape Town and Simon's Town with delivery due to the SA Navy within the next few months. The Survey vessel's hull seems largely completed with outfitting starting.
It would be great if the industry and Navy were able share more information and progress reports on these new builds with the maritime community.

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

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

Best regards

Kevin Watson
President SAIMENA

Membership Status changes for 2021

Membership Status Changed 2021

Accepted as MEMBER

Member No	Initials	Last Name	AuditDate
M2021008	P.	Schneider	01-Feb-21

Accepted as ASSOCIATE

Member No	Initials	Last Name	AuditDate
A2021009	L.J.	Jokazi	26-Oct-21
A2021007	N.B.	Khoza	05-Oct-21
A2021005	M.	Biyase	30-Jul-21
A2021006	M.F.	Goba	30-Jul-21
A2021004	C.J.	André	19-May-21
A2021003	A.I.	Incha	04-May-21
A2021002	J.G.	Borja	24-Feb-21
A2021001	J.P.	Tumbo	16-Feb-21

Accepted as RETIRED FELLOW

Member No	Initials	Last Name	AuditDate
RF1975173	T.D.	Forbes	05-Feb-21

Upgraded to Fellow

Member No	Initials	Last Name	AuditDate
F2006008	B.W.	Mvovo	18-Mar-21
F2008001	J.	Laubscher	17-Feb-21

Upgraded to Member

Member No	Initials	Last Name	AuditDate
M2020003	F.S.	Santos	21-Feb-21

Exempt section B 2.7.1

Member No	Initials	Last Name	AuditDate
RF1980025	R.R.	Shaw	07-Jul-21
M1993070	R.V.	Norman	22-Feb-21
F1984007	T.	Baker	21-Jan-21

Re-instated, fees paid

Member No	Initials	Last Name	AuditDate
A1992003	M.S.	Els	27-Feb-21
A2009025	M.S.	Zondi	26-Feb-21

Deceased

Member No	Initials	Last Name	AuditDate
A1991046	W.G.	Owen	23-Dec-21
M2009038	P.D.	Hangone	10-Dec-21
A1980031	J.R.	Hey	30-Apr-21

Resigned

A1996022	B.D.	Webster	15-Oct-21
A2016005	B.	Hoosain	23-Sep-21
M2011018	E.	Papendorf	14-Aug-21
M1984008	G.G.	Calder	21-Feb-21
F1989006	B.E.	Jubber	14-Jan-21
M1988022	A.G.	Kukard	06-Jan-21

Suspended as No member reply

S2015S010	I.D.	Balie	31-Jan-21
S2015S007	L.M.	Bonga	31-Jan-21
S2015S008	H.	Dzivhani	31-Jan-21
S2015S009	Z.	Geldenhuys	31-Jan-21
S2016S002	L.	Gomomo	31-Jan-21
S2015S020	K.L.	Hlela	31-Jan-21
S2015S017	T.	Kudumane	31-Jan-21
S2015S019	S.	Ludziya	31-Jan-21
S2015S004	P.	Mabuda	31-Jan-21
S2015S015	T.P.	Manamela	31-Jan-21
S2015S022	T.	Mazingi	31-Jan-21
S2015S002	L.S.	Metcalfe	31-Jan-21
S2015S021	N.Z.	Mgwaba	31-Jan-21
S2015S003	L.	Mntsantsa	31-Jan-21
S2015S011	M.A.	Moolagee	31-Jan-21
S2015S012	M.J.	Morara	31-Jan-21
S2015S005	P.M.	Mthethwa	31-Jan-21
S2015S018	A.	Ncaza	31-Jan-21
S2015S006	K.M.	Nombika	31-Jan-21

S2015S024	T. Qwabe	31-Jan-21
S2015S001	T. Rajoale	31-Jan-21
S2015S016	T. Rasivhaga	31-Jan-21
S2015S014	G.P. Sekatang	31-Jan-21
S2015S023	C.E. Sekgala	31-Jan-21
S2016S001	P.M. Sithole	31-Jan-21
S2015S025	T. Soke	31-Jan-21
S2015S013	J. Van Schalkwyk	31-Jan-21

Suspended due to no fee payment.

Member No	Initials	Last Name	AuditDate
A2009025	M.S.	Zondi 2	5-Feb-21
A2015001	G.L.	Walker	25-Feb-21
A2017003	R.V.	Shabalala	25-Feb-21
A2008025	R.L.	Riekert	25-Feb-21
A1992028	C.H.	Opperman	25-Feb-21
A2015004	J.	Olwage	25-Feb-21
A2016009	T.M.	Ndhlovu	25-Feb-21
A2009016	C.A.	Kleinhans	25-Feb-21
F1985012	R.W.	Holmes	25-Feb-21
A2005003	D.S.	Gould	25-Feb-21
A1992003	M.S.	Els	25-Feb-21
M2009037	H.W.	De Voogt	25-Feb-21
A2000002	D.C.	Culey	25-Feb-21
M2014006	R.F.D.	Dias	24-Feb-21
A2010009	M.S.	Williams	24-Feb-21
A2009001	P.M.	Pillay	24-Feb-21

Membership Status Changes 2022

Accepted as ASSOCIATE

Member No	Initials	Last Name	AuditDate
A2022001	M.M.	Smit	10-Feb-22
A2022002	G.R.	Smit	10-Feb-22

Exempt section B 2.7.2

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

Deceased

Member No	Initials	Last Name	AuditDate
M1996011	P.S.	Geisler	06-Jan-22

Resigned

Member No	Initials	Last Name	AuditDate
F1986013	L.R.	Palmer	14-Feb-22
M2019007	D.P.	Olds	11-Feb-22
A2008022	B.P.	Dunn	09-Feb-22
A2006009	B.J.	Fish	07-Feb-22

Suspended as No member reply

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

The Editors Desk

First my apologies for this late edition of the TOJ.

It was my intention to get the magazine published and out to you guys in November 2021 but due to a family emergency which took priority , the TOJ went to the bottom of my “to do‘ list.

So as we rapidly approach year 3 of the Covid world, we ask how has it affected SAIMENA. Quite seriously actually as Branch meetings have been few and far between, in fact I am not sure if any have been held even with zoon or any of the other seemingly numerous online meeting platforms.

National Council meetings have been held online with zoom, but doubt if there has been half a dozen over the last 2 1/2 years.

Consequently the composition of both National Council and Branch committees are out of kilter with the constitution requirements but, given the circumstances understandably so.

Off course there have been no social functions as that would be against the law, and the only other functions I know about have been the presentation to Lawhill school and the attendance at the William Froude memorial.

Despite this most of our members have remained loyal and understanding with no recorded complaints that I am aware of.

There is a growing voice that Covid should be treated as a form of influenza and we all should learn to live with it.

Given the financial mayhem, the employment disaster, the numbers of business that have gone to the wall, and the abnormal demand that man’ s inbuilt social interactions should be restricted due to Covid 19 , Omicron and the other seemingly endless variants, plus long term covid, perhaps we should learn to live with it. Anyway any more holes jabbed into my arm and I should change my name to Colander.

It was with dismay that I learnt that South Africa lost its seat on the IMO council last year, reportedly due to lack of urgency by SAMSA to garner votes and a concern over “slipping” standards.

South Africa is a founding member of the IMO and has held a council seat since that founding, so to lose it is a concern.
I suspect the almost non existent South African flagged merchant marine doesn't help.

With that in mind we last year finally said goodbye to “SAFMARINE”, as the holding company has decided to dispense with that tradename and with one stroke of a pen the last vestige of the epitome of the South African merchant marine was dispensed to the gloom of history.

Many years ago SAIMENA established a relationship with RINA (Royal Institution of Naval Architects), but somewhere along the years we lost contact, so it was good to know that that association with RINA has been reconnected and both our organisations can benefit from interaction and sharing of info such as this publication.

Once again I ask any of you that if you have an interesting story you would like the readers of this publication to know on any subject (marine engineer stories preferred), please do not hesitate to get in touch with me and we can mull over it.

The Editor

OBITUARY

I have to regrettably announce the passing of Philip Geisler in January this year.

Philip was an active chief engineer and was preparing to re-join a vessel when he passed.

He was a long standing member of SAIMENA (26 years) and attended meetings at every opportunity.

Known to many of our older members, Philip will be missed and our condolences go out to his family and friends

ARC FLASH AT SEA – A STARTING POINT

As ships grow larger or take on industrial functionality as occurs in the largest container ships, or FPSO ships, or mining, or any number of other ships, the electrical generation on board has grown.

Cargo and industrial needs take up much more energy than hotel services, (except of course when 6000+ passengers are catered for – yet another special category) with the result that ship's generation resembles a power utility more than an in-house service.

Designers, specifiers, surveyors, owners and operators in the marine industry would do well to exercise some caution when assessing risks associated with faults that occur inside switchboards. Arc flash risk is one such aspect, and often treated as a manufacturer's problem and not an operational liability.

The engineering term "arc flash" has its origin in American industry, and mitigation focusses on increased safety of the individual through clothing and practices which separate the switchgear from human proximity.

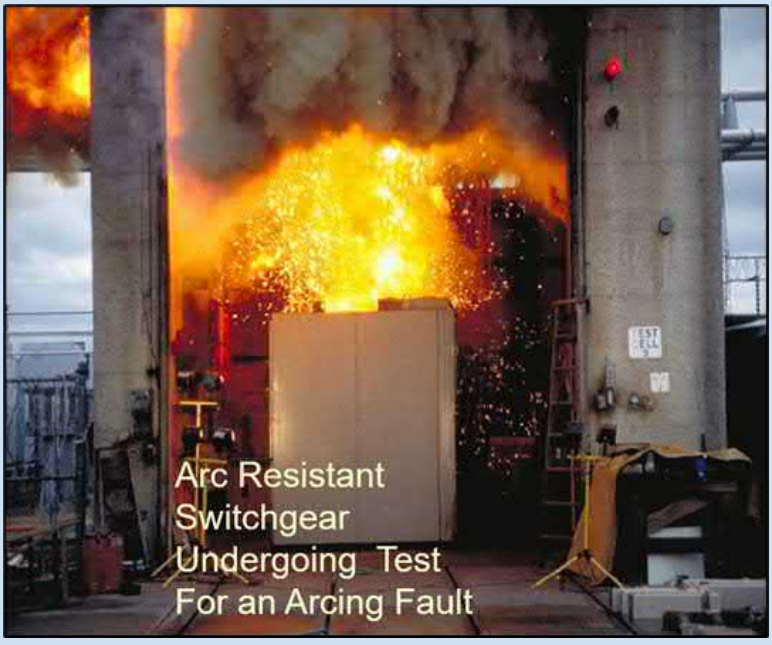
A principal key of the American philosophy as applied to arc flash is that the parameters which lead to the risk of death, injury or asset loss through arc effects are quantified for arc incidents. Arc flash occurs where a workspace in a switchboard has conductors exposed to open space at the time of a short circuit, or where exposure is triggered by (a.o.) enclosure failure because of a short circuit. The assessed parameters determine the characteristics of the required PPE, and in defining "deemed safe" switching procedures.

In the European environment, a related engineering concept was developed in the form of "internal arc certification (IAC)". The standards require that the method of construction of a switchboard is such that arc effects are contained behind the enclosure's cover(s) or are directed away from personnel. The objective is to achieve an environment which limits the risk of injury to quantified extent, and to achieve this in close proximity to the switchboard.

In a nutshell, where in the USA the recommended mitigation is to separate the individual from the arc in the switchboard, the European mitigation is to separate the arc from the individual. And here lies the crunch. Arc Flash defines what happens through open doors, IAC defines what happens behind closed doors.

The philosophies are complimentary and not mutually exclusive, and specifically, IAC is not a countermeasure for arc flash.

Regardless of the underlying philosophy, arc faults *will* occur inside switchboards and the effects must be managed to support a safe working environment.



Magazine articles, the introduction of generic arc flash calculation software and increasingly, the popular *mis*understanding of the differences between arc flash and IAC principles has led to crosstalk, contamination of mitigation, inappropriate operational practices and the introduction of risk factors to substations.

Flawed thinking leads to avoidable risks.

Some common assumptions that would bear reassessment, in no particular order, are:

1. Assuming that an IAC certificate allows safe working conditions in a switchboard with one or more doors open.

   An open door is an arc flash condition while the switchboard is energised and PPE to suit the risk must be worn.

2. Assuming that a substation is safe because the switchboard has an IAC rating.

   This is only true if the compartment dimensions do not require that arc products are to be ducted away. Deckhead height and the overall compartment dimensions can prevent the pressure wave and arc debris from dissipating safely.

3. Assuming that smaller switchboards do not have an arc flash risk.

   The risk exists in all energised enclosures, including single phase distribution boards and should ideally be assessed part of an arc flash hazard study.

4. Allowing a compartment containing switchboards to also serve as a transit route for personnel.

   Equipment ageing and eventual failure can and does occur in the best products. Crew are unlikely to wear PPE appropriate to the substation's assessed risk while in transit.

5. Assuming that a low arc flash category in one area also applies to all other parts of a switchboard.

   The risk of injury is specific to the location and outfitting of each element of the switchboard. Different sections will present different risks and procedures and PPE must be adapted to the assessed category of risk.

6. Assuming that batteries and DC systems do not present arc flash hazards.

   DC (Direct Current) arcs are particularly onerous to contain. The risk is not only in the battery room.

Acknowledgements: Org Nieuwoudt

Ton class minehunters

An old article from 1994 which may be of interest to some of our SAN members

CONVERSION TO MINEHUNTER

I thought this would interest all the technical fundi's out there especially those that served on these great little ships. The requirement for minehunters still existed and SAS MOSSELBAAI and SAS PORT ELIZABETH were allocate for conversion.

These ships were basically unsuitable for conversion to minehunters as their Donkin Hydraulic steering gear would not permit the large rudder angles needed to make the active rudders effective.
For this reason, the project could not be allowed to proceed until the availability of two ships sets of Reids quadrant steering gear, fitted to the ships completed with Mirrlees engines had been confirmed.

Fortunately, a well-known South Coast shipbreaker was able to supply two sets, complete and undamaged. All MOD(N) conversions had been carried out in two phases, namely conversion from Mirrlees propulsion to Deltic propulsion followed by conversion from minesweeper to minehunter. As we were starting off with a pair of Deltic powered ships, many of the guidance drawings received from MOD(N) were no longer applicable, and a large number of new installation drawings had to be generated.
One of the measures taken to achieve this, and an innovation as far as the S.A. Navy was concerned, was the formation of a Project Team made up of Constructive Mechanical and Electrical draughtsmen, led by a Design Project Officer.

MINE DISPOSAL WEAPONS
During the preparation of installation drawings for the mine disposal weapon magazine to be located in the position previously occupied by the Pulse generator, it was discovered that the weapons had not been ordered from MOD(N) as part of the requirements. .
By this time, late 1975 it was no longer possible to obtain them from the source so as an alternative means of destroying mines had to be found
The only solution to the problem was to develop and manufacture a suitable weapon and this was embarked upon as a matter of urgency.
A locally produced explosive charge, firing unit and detonator were fitted into a spun GRP casing and the weapon was subjected to a programme of operational tests and evaluation.
It was decided that instead of slinging the weapon underneath an inflatable boat, it would be delivered by means of a Remotely Operated Vehicle (ROV)
As it was envisaged that the magazine would be sited on the main deck and therefore be unprotected, the weapon was taken to a firing range at Touws River, in the Cape, where it was assaulted with 7,62mm. 0,5”,20mmand 40mm rounds to verify its ability to withstand damage without detonating.
In the event of both ROV units being out of action, the weapon could still be delivered by slinging it below an inflation boat and winching it down to the seabed in the vicinity of the suspected mine.

SWEEPDECK ARRANGEMENTS

The sweep deck layout was rearranged around the two ROV units. In addition to the magnetic loop, the minesweeping winch and davits were discarded to make room for a new structure incorporating two ROV magazines, diving gear store, divers changing room and a ready use magazine for small arms ammunition. The new structure, extended from frame 67 to frame 81 and stowage's for two inflatable boats and six short scope buoys were fitted on top.

To compensate for the loss of the minesweeping winch, a small hydraulic winch was fitted on the quarterdeck for mooring and other duties.

SUPERSTRUCTURE ARRANGEMENTS

Envisaged changes to the superstructure on the forecastle deck were such that it was decided to construct a completely new unit. Having taken this decision, it was further decided to square off the bridge front and incorporate switches, controls and instruments, including the steering compass, in consoles.

An ergonomic study was carried out to determine the optimum situation and orientation of the consoles, particularly those mounted on the deckhead. In order to achieve this without encroaching on the bridge windows, it was found necessary to raise the deckhead height by 150 mm.

On board, the MOD(N) Second Flight minehunters the steering console was situated in the starboard forward corner of the bridge. This arrangement was not favoured by our MCM specialists so the console, with joystick rudder control, was sited behind a screen at the forward end of the chartroom, which was the full width of the bridge. The type 974 radar with obso-
lete

On the deck below, space previously occupied by the wheelhouse was fitted out as the ship's office and the space below the chartroom became the mine hunting operations room. The MOD(N) Operation Room layout, with operators facing aft, was represented in a full-size timber mock-up. MCM specialists were invited to choose between this arrangement and an alterna-
tive in which equipment was turned around so that the operators faced forward. The latter was favoured and was incorpo-
rated into the design.

Instead of replacing the Type 974 radar with obsolescent Type 975. It was decided to purchase Kelvin & Hughes Type 1006, which would drive the Mk 20 Plotting table through a digital to synchro converter. The scanner was mounted on top of a plated mast, which served the double purpose of increasing the height above sea level and providing a degree of protection for the waveguides and cable runs.

The "Tiger`s Tail" sighting frame, supplied as part of the original mine hunting outfit, was fitted for use when sighting frame, supplied as part of the original manhunting outfit, was fitted for use when the disposal weapon was to be delivered by means of an inflatable boat.

HABITABILITY

An attempt was made to improve the habitability of the vessels by converting the Junior ratings and Petty Officers messes on the main deck to dining halls, obviating the necessity for hot food to be carried down to the lower deck.

Sleeping accommodation for Petty Officers displaced due to the conversion of their messdeck was provided on the Port side of what had been the forward fuel tank space (frames 31 to 38). The deck space in the after-JR Mess deck (frames 22-31) was obstructed by the access hatch to the Hull Outfit

222. This was covered by a portable unit comprising a circular padded bench with a card table in the centre. fitted with a serving hatch to the lobby and Bain Marie unit and plate dispenser, greatly facilitating the serving of meals.

FUEL CAPACITY

Six fuel tanks with the combined capacity of 22,38 tons were removed from the forward fuel tank space

To compensate, to a certain extent, for the loss, two tanks of 6.00 tons capacity were fitted on the pulse generator beds and an additional tank of 2,29 tons capacity was fitted below the observation booth in the generator compartment. The improvement in habitability was considered to justify the sacrifice of 8 tons of fuel

ELECTRICAL ARRANGEMENTS

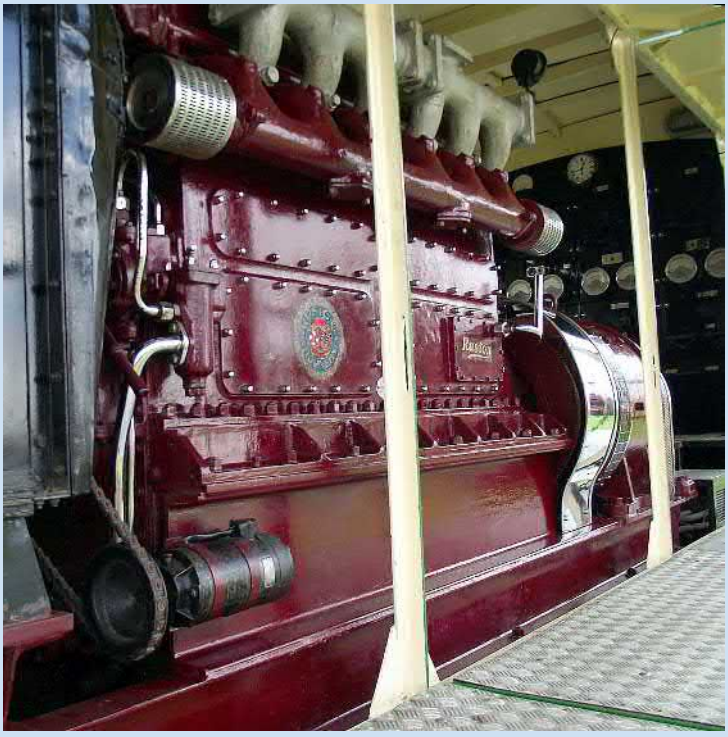
An additional Foden diesel generator was fitted in the generator room bringing the number on board to four.

Two static inverters, each delivering 10 Kva, were installed to convert the 220-volt DC supply to 115Volt 60Hz for communication and radar. One was sited in the engine room and the other in the sonar compartment. A 3KVA inverter was of local design and both types were locally manufactured. The output transformers were split into two sections orientated so that their magnetic fields opposed one another and both types were made up of modules designed to pass thru a 600mm x 600mm opening. After the first ship had entered service it was found that the inverters caused interference which affected the mine hunting sonar. This problem was reduced by the installation of filters but was never completely eliminated.

An automatic emergency supply to the communications equipment was provided by a small inverter designed and built by RCS (Pty) Ltd. This converted the 24V battery supply to 115V 60Hz and was sited below the observation platform in the generator room.

Replacing the type 974 radar with type 1006 made redundant some of the equipment in the radar power room on the main deck opposite the galley. In addition, the rotary converter was sited in the eddy current compensating equipment compartment allowing the space occupied by the radar power room to be incorporated in the W/T Office.

Cable route diagrams were generated for the first time on a South African Navy project and a financial saving resulted from their use for determining the quantities of cabling required for the ship



Not a Foden but gives effect

Multi Cable Transit (MCT) glands were also used for the first time aboard a SAN ship. The degaussing system was modified to take account of changes in the configuration of the ship and an additional coil was inserted below the hydraulic crane in order to neutralise its magnetic field.

The vessels were fitted with commercial marine-type fire detection systems

CONVERSION

SAS PORT ELIZABETH was the first of the two to undergo conversion starting in mid-1976
The hull and superstructure were stripped of deck equipment, machinery fuel and water tanks prior to being lifted out and parked adjacent to the submarine repair shed. Aluminium alloy backing plates were surveyed and replaced where necessary isolated areas of pitting were repaired using Devcon compound.
The SAN had very few drawings relating specifically to Deltic engine Ton Class minesweepers. The refit Project Manager was therefore surprised to discover during the strip out phase that the ship carried several tons of lead ballast to make up the difference in mass between the Mirrlees and Deltic engines.
The forward fuel tank space was stripped out and the pitch coating was removed from all surfaces. A flat was constructed just below the level of the lower deck and bulkheads were fitted to divide the space above into a PO`s Mess (Port), lobby with access hatch over, and sonar instrument space (Starboard), The sonar cooling pump was fitted in the space below the flat
The three new diesel tanks referred to previously were constructed in aluminium alloy to be fitted in the generator room.
One of the most critical tasks was the fitting of the support structure for the type 193 sonar transducers and dome. This involved bracing the structure in the area between bulkheads 22 and 28, cutting out a section of the keel and lining up and riveting the prefabricated support structure in place. A device normally used to machine gun rings was adapted to work upside down in order to machine the dome seating ring.

This being done, the hull planking could be replaced and the ship rolled out of the shed so that the fitting of structure and equipment requiring craneage could begin, Due to a gap in the submarine refitting programme the submarine refit hall, equipped with overhead traveller cranes, was not being used so SAS PORT ELIZABETH was able to occupy it during the later stages of her conversion.
The refit had one more surprise in store when it was found that the two Foden Mk 7 engines required to drive the active rudder units would not fit on the seating's provided. Scrutiny of the drawings revealed the fact that the MOD(N) guidance drawings used was intended for a First Flight ship fitted with Thorneycroft diesels.
OPERATION
The two ships operated for a relatively short time, seven years in the case of SAS PORT ELIZABETH and a mere three in the case of her sister, but provided useful platforms for the development of mine hunting procedures. The accommodation and Galley arrangements were popular, particularly with the Senior Ratings who found their new messdeck to be more comfortable than the original one.
The synthetic material selected for the deck seams was not very suitable and leaks were common.
Ships companies soon became practised in the handling and operation of the ROV`s
Handling of boats and buoys using the hydraulic crane required a fair amount of skill on the part of the operator sited on top of the diving store. While picking them up or placing them on their stowage on the housetop his attention was divided between the crane aft and the load forward. After an early mishap, a strongback was fitted over the control console to prevent the boom coming down on top of it while the operator's attention was otherwise occupied.
The main problem with the two ships was the obsolete Type 193 sonar, which by that time was more than ten years old, could not consistently provide images of the quality required. When it did work well it was very effective but unfortunately, it could not be relied upon to work all the time. Had these ships been supplied with the Solid-State Type 193M or a more modern sonar they might have outlived the minesweepers.

Acknowledgements: Bill Rice

A Brief Overview of Ship Recycling

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Ship recycling, also referred to as ship dismantling or ship breaking, is a process of breaking down a ship when it reaches the end of its life. Ship dismantling involves the retired ship to be stripped of its gear, equipment, machinery and materials which are then reused, recycled or disposed of. Ship dismantling is typically carried out when the cost of maintaining the ship far outweighs the benefit of operating the ship. Ship recycling poses significant risks to personnel carrying out the operation and to the environment, which is why the process needs to be controlled and contained as far as practicable

There are several guiding bodies and conventions for the recycling of ships. One of the prominent conventions is the Hong Kong International Convention (the Convention) which was developed in 2009 for the safe and environmentally sound recycling of ships. The Convention is aimed at safeguarding human health and the environment when ships are recycled. If ship recycling is not done in a safe and responsible manner, it poses significant risk to workers and the environment, which can lead to injuries, work-related illnesses and even fatalities. Ships contain many hazards, ranging from physical hazards to chemical hazards

As ship recycling is deemed one of the most hazardous professions in the world, the Convention addresses concerns about working and environmental conditions. The Convention was developed in co-operation with the International Labour Organisation (ILO) and the Parties to the Basel Convention. The Convention was supplemented by the European Union Ship Recycling Regulation that was drawn up in 2013. The Convention covers the preparation and operation of ships, the operation of ship recycling facilities and the establishment of regulation enforcement by certification and reporting requirements. Ships with a gross tonnage of 500 or more are required (IMO MEPC.223(64)) to have a Ready for Recycling Certificate.

There are various stakeholders in the ship recycling process, namely:

a. Ship Owner. The owner sells the ship directly to the Ship Recycling Facility or lets a broker handle the sale once their ship is no longer fit for purpose.

b. Ship Broker. The broker sells the ship on behalf of the owner to an SRF. The broker earns a commission for facilitating the sale.

c. Ship Recycling Facility. The SRF buys the ship directly from the owner or from the ship broker. The SRF deals with the breaking down of the ship into scrap metal and/or repurposed parts. The SRF will have the facilities to break down the ship or sub-contract specialised functions.

d. Sub-contracted Functions. If the SRF does not have all the functions (e.g., asbestos removal) to break down the ship, these functions are sub-contracted.

e. Buyers of Scrap and Repurposed Parts. These entities deal with the buying of scrap and repurposed parts from the SRF. They will sell the scrap to entities that recycle the materials and sell repurposed parts to the relevant market. Components that cannot be recycled or repurposed are disposed of.

There are various ways in which a vessel can be broken down:

a. Dry docking. The ship is moved into a dry dock and the water is pumped out, leaving the vessel on hard blocks. The main advantage of this method is that it is the safest method and the environmental risk is low. This does, however, influence the docking schedule of other vessels, especially if emergency docking is required.

b. Alongside in water. The vessel is secured alongside a quay in calm waters. The majority of the vessel is removed alongside and then floated to a dry dock for final breaking down. This type of operation should bear in mind how buoyancy and gravity forces will affect stresses in the weakened hull. Cable Restorer in Simon's Town Harbour recently suffered damage to the midships area due to buoyancy and gravity forces.

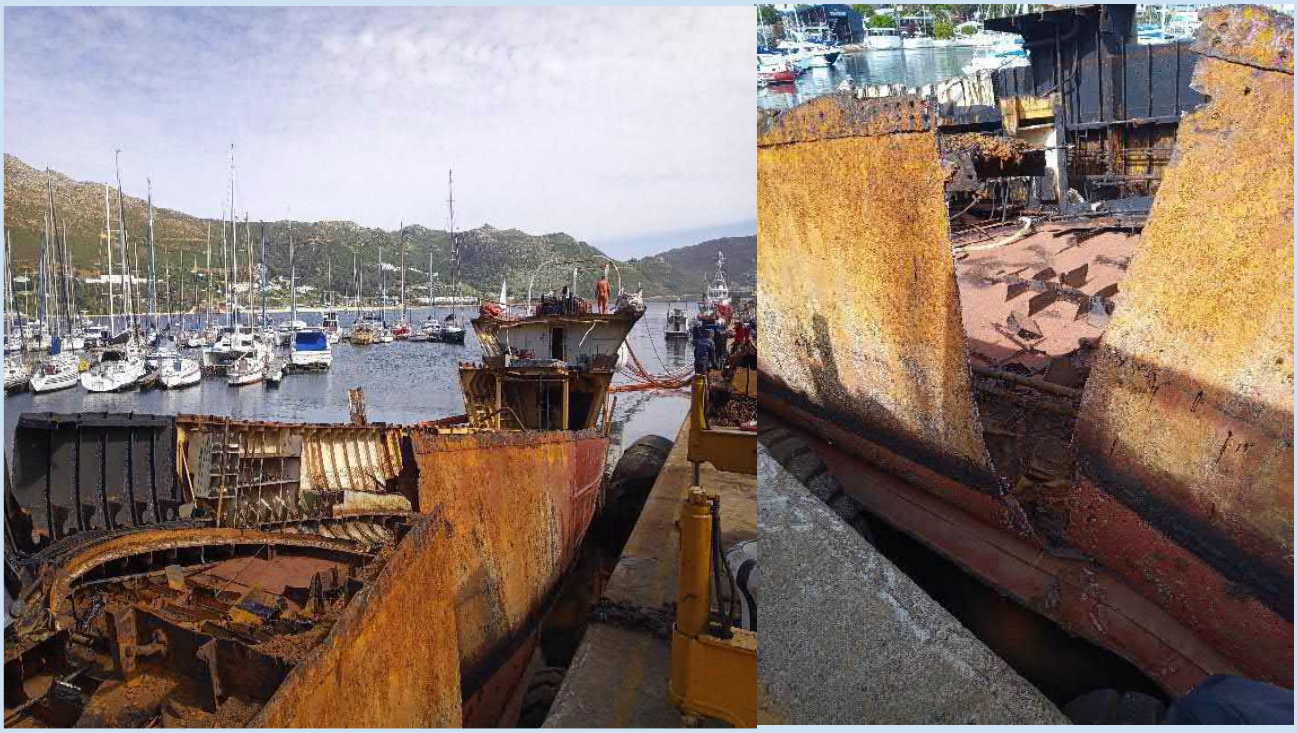


Figure: Midships of Cable Restorer

c. beaching. The lightened vessel sails full steam onto a tidal beach. The vessel is then broken down on the beach. This method poses the highest environmental risk and the vessel may shift due to tides, causing possible further risk.

d. Slipway. The vessel is secured on a slipway with little or no tides. The vessel is broken down by equipment ashore. With this method temporary quays or jetties can be constructed.

Before a vessel can be recycled, a Ship Recycling Facility (SRF) and Ship Recycling Plan (SRP) must be established and approved. The SRF is the location where the ship will be recycled and the SRP is the guiding document used to break up the ship. The SRP mainly consists of four parts: The Inventory of Hazardous Materials, Environmental Protection Plan, Operational Plan and Health and Safety Plan.

The International Maritime Convention, MEPC.196(62) 2011 *Guidelines for the Development of the Ship Recycling Plan*, requires that an SRP be explicitly approved by a Competent Authority (typically the harbour authority) and verified as accurately reflecting the information contained in the Inventory of Hazardous Materials (IHM) during the final survey before issuance of an International Ready for Recycling Certificate.

INVENTORY OF HAZARDOUS MATERIALS

The IHM is essential to the SRF for planning and executing the removal and management of hazardous materials in a safe and responsible manner. The objective of the IHM is to comply with the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships. The information contained in the IHM provides ship specific information on the actual hazardous materials present on board. This is done to protect the health and safety of personnel and prevent environmental pollution at ship recycling facilities. Special attention should be paid when recycling older vessels as they were often constructed with materials such as asbestos, lead, cadmium and polychlorinated biphenyls. The final draft of the IHM includes all hazardous materials, their allowable exposure limits and procedures to contain and dispose of them.

ENVIRONMENTAL PROTECTION PLAN

The aim of the environmental protection plan is to prevent pollution and ecological degradation while promoting conservation as far as reasonably practicable. The National Environmental Management Act 107 of 1998, Environmental Conservation Act 73 of 1989 and National Water Act 36 of 1998 govern the National regulatory measures to be taken to ensure that the environment is protected during ship recycling activities. Environmental protection is an ongoing process and may vary according to different circumstances. Documentation and communication is key in ensuring all personnel are aware of environmental protection principles and procedures. A basic environmental impact assessment must be carried out by the facility authority to determine environmental outcomes, impacts and residual risks of proposed activities. The assessment report shall be carried out in accordance with Appendix 1 of the Environmental Impact Assessment Regulations 2014.

OPERATIONAL PLAN

The aim of the operational plan is to guide personnel through the ship breaking process. The process is typically broken down into the following phases:

a. Risk Identification and Assessment. This process is incorporated in the facility site inspection and will be used to determine subsequent ship breaking steps.

b. Removal of liquids, ammunition, flammable, toxic and hazardous materials and items. This step involves the removal of fluids such as fuel oil, lube oil, chilled water, hydraulic oil and the like. It also involves the blowing down of pressure vessels, removing flammable and toxic items and draining all bilges. Several bowsers may be needed to remove the fluids. Before any work can commence, safety certificates/permits need to be issued. These include, but are not limited to, Safe for Work, Safe for Hot Work and Gas Free.

c. Installation of safety equipment. This step involves the installation of additional ladders, stairs, scaffolding, strong points, guard rails, etc. to prevent falling, tripping and slipping hazards.

d. Removal of access equipment inside the vessel. The removal of doors, hatches, windows and similar equipment will free up space inside the vessel and make movement inside easier. The removal of access equipment also promotes ventilation. Ventilation and lighting equipment is to be installed where deemed necessary.

e. Removal of superficial equipment. All surface mounted equipment that is removable by hand is removed.

f. Removal of small ship equipment. The removal of larger, non-structural fittings like brackets, pipes, pumps, etc.

g. Removal of superstructure. The superstructure is cut from the top down. It must be born in mind that cranes will be necessary for this step and that lifting lugs are to be fitted to equipment. Typically, a large section of material is removed and placed in a designated area where it is cut up into smaller pieces.

h. Breaking of ship hull. The remainder of the ship is cut up systematically in order to keep the centre of gravity and centre of buoyancy (if applicable) in a safe and known location. In this way additional supports can be rigged to keep the vessel in a steady position. This step requires accurate accounting of all equipment being removed and their respective positions on the vessel.

OCCUPATIONAL HEALTH AND SAFETY PLAN

The aim of the OHS plan is to protect employees, contractors and the public from Occupational Health and Safety related risks as far as reasonably practicable while delivering the required service and conforming to all regulations of the Health and Safety Act 85 of 1993. It is advisable that OHS be supplemented by guidelines such as the International Labour Office Safety and Health in Shipbreaking Guidelines, ISO 18001 Occupational Health and Safety Management System and the US Occupational Safety and Health Administration Safe Work Practices for Shipbreaking. Where OHS risks cannot be mitigated, personnel are to be protected by personal protective equipment. It is also recommended that emergency facilities are available such as first aid stations and firefighting equipment.

Preparation of the SRP should therefore begin well before the ship arrives at the Ship Recycling Facility and include as many details as possible.

The International Maritime Organisation (IMO) has listed several guidelines to assist in setting up the required documentation:

a. Resolution MEPC.196(62) – 2011: Guidelines for the development of the Ship Recycling Plan.

b. Resolution MEPC.210(63) – 2012: Guidelines for safe and environmentally sound ship recycling.

c. Resolution MEPC.211(63) – 2012: Guidelines for the authorization of ship recycling facilities.

d. Resolution MEPC.222(64) – 2012: Guidelines for the survey and certification of ships under the Hong Kong Convention.

e. Resolution MEPC.223(64) – 2012: Guidelines for the inspection of ships under the Hong Kong Convention

f. Resolution MEPC.269(68) – 2015: Guidelines for the development of the Inventory of Hazardous Materials.

Several challenges with ship recycling remain, in that regulations cannot be monitored and/or enforced properly and there is a large market to defer the costs of ship recycling to countries such as Bangladesh and India, where labour is inexpensive and not much regard is given to the environment and/or working conditions. With that being said, in recent years there has been a big drive by the international community to set up recycling facilities that are not only safe, but also sustainable and in line with the regulations contained in these conventions .

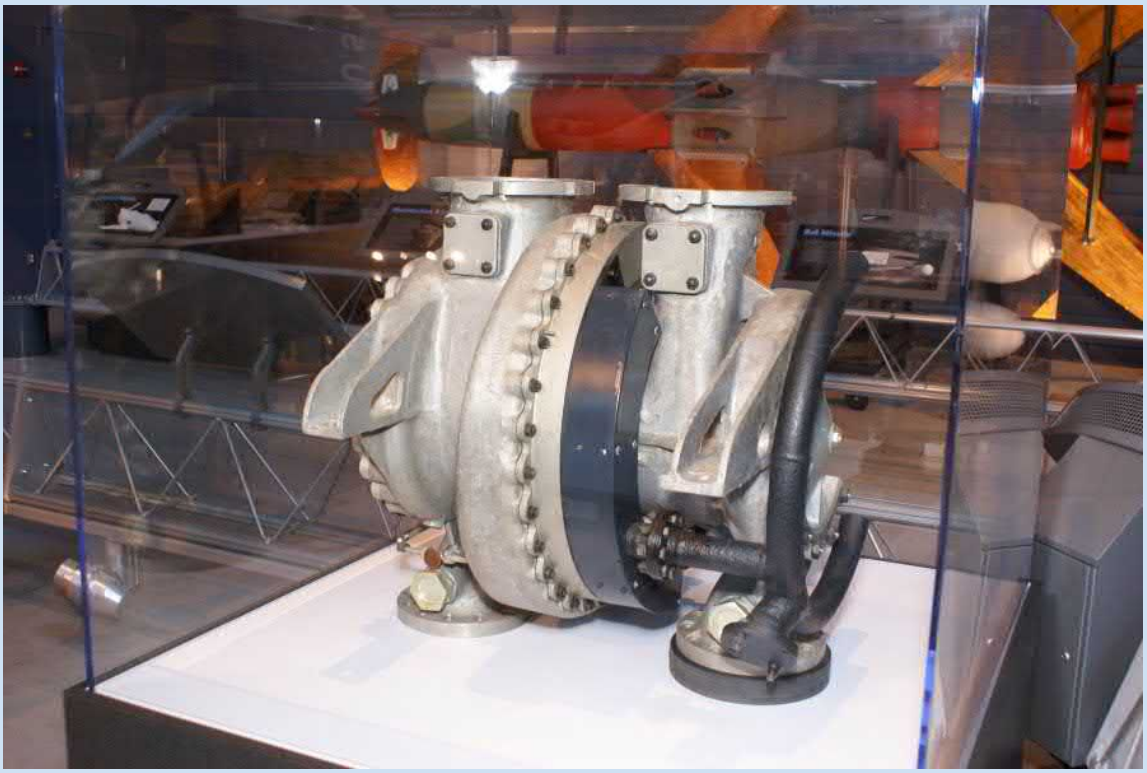
ACKNOWLEDGEMENTS : Jacques de Klerk

V2 Machinery

The V2 was a ballistic missile developed in Germany during the 2nd world war and used to attack primarily the cities of Antwerp and London. You may well ask what has that got to do with marine machinery.

Interestingly the machinery used to pump the rocket fuel is well known to marine engineers, but first let me explain what the missile was propelled with.

The rocket's combustion chamber is supplied with liquid O2 (oxidizer) and Alcohol (fuel, also known as ethanol), by independent pumps to the combustion chamber nozzles where it was ignited, providing the 25 tonnes of thrust to "lift off". This type of means to supply fuel to rockets and missiles is still very common today. The German authorities had a problem with staff drinking the ethanol which was very much like high alcohol content vodka. The next time you take a stiff drink and remark about it being like "rocket fuel", you wont be far wrong.



V2 Fuel Pump Assembly

The ethanol and liquid O2 was supplied by independent high volume pumps. These independent pumps on a common shaft were volute Centrifugal pumps which any marine engineer would be very familiar with. So what was used to drive the pumps?

In the photograph above you can see the two volute pump casings and in the centre is a turbine. If you have studied for a steam CoC, or been on a ship that has turbine driven pumps, you will also be familiar with the Curtis turbine. The Turbine on the V2 is a single stage Curtis turbine, that is, it has one set of revolving blades followed by a set of fixed blades, then another set of revolving blades. The blades being of the impulse type.

This turbine was driven by superheated steam which in turn drove the two pumps at the required speed (up to 5000rpm), to deliver the fuel requirement.

I know what you are thinking now. "Where did they get the superheated steam to drive the turbine". This doesn't have a marine engineering connection but I will explain for the sake of interest.

The steam generating chamber was basically a small boiler but instead of burners a chemical reaction generated heat to raise water to a superheated steam state..

The steam chamber or boiler drum, if you wish to call it, contained a mixture of water and a catalyst (Sodium Permanganate).

A high strength Hydrogen peroxide was injected into this chamber which reacted with the catalyst, generating intense heat, that in turn generated the superheated steam which was then directed to the turbine, did its work, and was thereafter exhausted to atmosphere . The intensity of heat and time needed was governed by the quantity of hydrogen peroxide injected into the chamber containing the water/catalyst mixture. Of course the catalyst had to be of sufficient quantity to react with the hydrogen peroxide so as to allow the "burn" to be of sufficient length to reach the altitude desired before cutting out and plunging to earth.

Consequently quite a small steam generator was achieved that could fit into the confines of the missile. In modern missiles/ rockets, it is also common to use hydrazine as a fuel.

A steam man will recognize hydrazine as a boiler water additive to control the quantity of free oxygen in boiler water as a means to reduce corrosion.

Simply put this is how this missile obtains thrust but of course the system would also have a number of control valves, complex pipework, guidance systems and safety systems etc.

Acknowledgements: Iain Armstrong

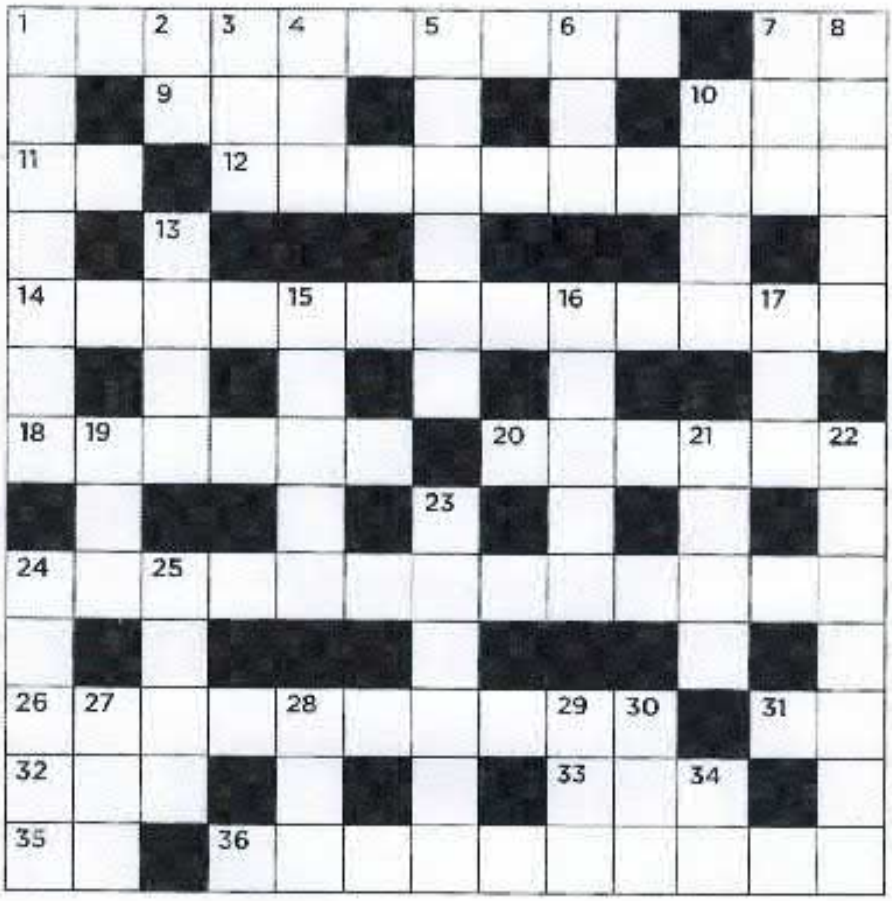
TOJ Crossword

ACROSS

1. Beloved TV star
7. Give approval
9. Tic-tac-toe victory
10. "See ya!"
11. Fee, fi, ___, fum
12. Part 1 of an observation by 1 Across (three words)
14. Part 2 (three words)
18. Baltimore's favorite bird
20. Right away
24. Part 3 (four words)
26. Part 4 (two words)
31. You and I
32. Layer
33. Presidential nickname
35. Bygone love
36. Part 5 (three words)

DOWN

1. Bills home
2. In the direction of
3. Child's delight
4. ___-hoo!
5. Lady Byng Memorial Trophy sport
6. Catch some rays
7. Olive ___
8. Shade of green
10. Neuwirth of *Cheers*
13. Hagar the Horrible's daughter
15. Oklahoma's second-largest city
16. Prize money
17. Fragment
19. "Go, team!"
21. Slangy denial
22. Healthy breakfast
23. Overexert oneself
24. Traditional church donation
25. Paradise
27. Bad spell
28. Seek political office
29. Clamor
30. Hit the slopes
34. *The Wizard of Oz* aunt



A Ships Keel

The keel of a ship is the main structural member and backbone of a ship or boat, running longitudinally along the centre of the bottom of the hull from stem to stern. It is similar to the spinal cord of humans. As the spine functions to keep our backbone upright by linking and supporting our body, the keel is the primary structural member and backbone of the vessel which runs along the centreline of the bottom plate around which the hull of the ship is built. It is the main longitudinal component of the ship to which every other main structural item is connected directly or indirectly.

A bilge keel is a nautical device used to reduce a ship's tendency to roll. *Bilge keels* are employed in pairs and are indicated in the below photograph as attached to the hull on both port and starboard sides..

Under keel clearance: It is the vertical clearance between the deepest point of the ship in the water and the seabed. It is important to calculate the under-keel clearance of vessel to avoid grounding of the ship. Safe under keel clearance helps the ship to manoeuvre so that no damage to the hull occurs due to hull impact on the ground.

Under-keel clearance is calculated as follows:

UKC = (Charted Depth of Water + Height of Tide) –(Draft)

Keel Laying: Laying the keel is the first part of a ship's hull construction and the day is often marked with a ceremony known as keel laying ceremony. Keel related traditions from older times are said to bring good luck to the ship during the construction process and to the captain and crew during the vessel's sea life.

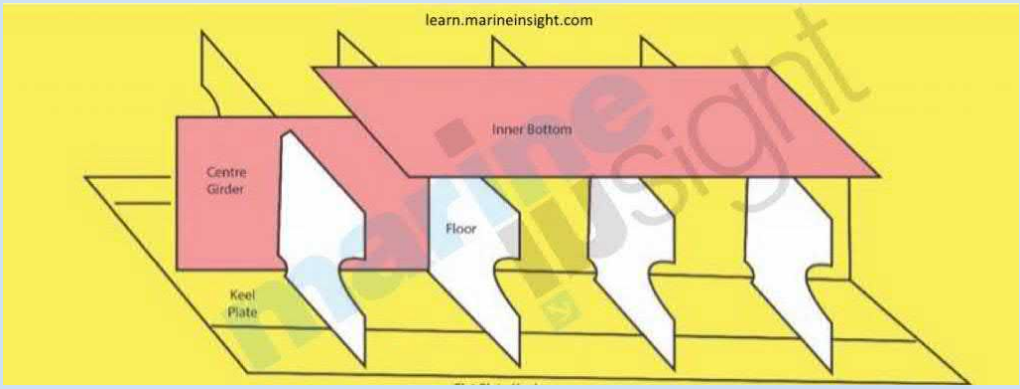
It is attended by ship owners and shipbuilding dignitaries and is considered as a significant moment in shipbuilding process. Keel laying also has importance in many IMO conventions as it's the date the construction of the ship starts.

According to SOLAS Chapter 5, 'constructed' concerning ships means a stage of construction where the keel is laid. Keel laying date is taken reference for various classification surveys, inspections, modifications, etc.

Types of Keel There are three types of keel namely flat keel, bar keel, and duct keel.

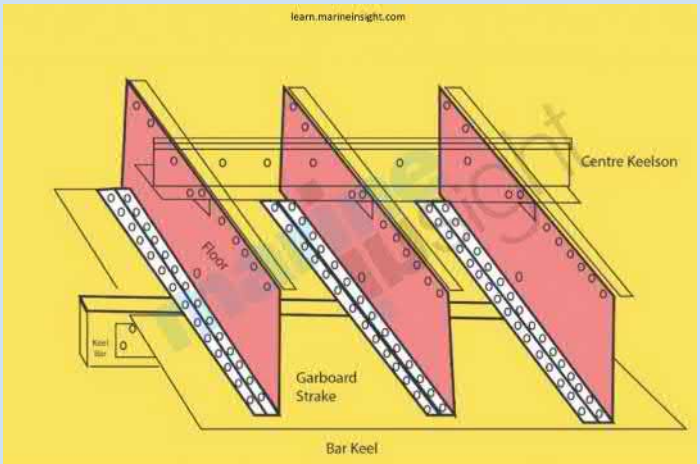
Flat Keel is a solid plate which is supported by frames running around the vessel. It is thicker than the adjoining plates and must be of full uniform thickness for 3/5th length amidship. It may gradually reduce towards ends of the ship and is most common in a majority of ocean-going vessels.

Flat plate keel may be fitted with the single bottom hull or with the double bottom hull. In single bottom hull construction, the flat keel plate forms an 'I' section with a vertical longitudinal centreline plate on top of it and a horizontal plate above the longitudinal beam. The vertical longitudinal beam is known as Keelson plate, and the vertical plate above it is known as the Rider plate. In double bottom construction, flat plate keel forms a strong 'I' section with the vertical plate commonly called the centre girder and the horizontal plate being part of the tank top.

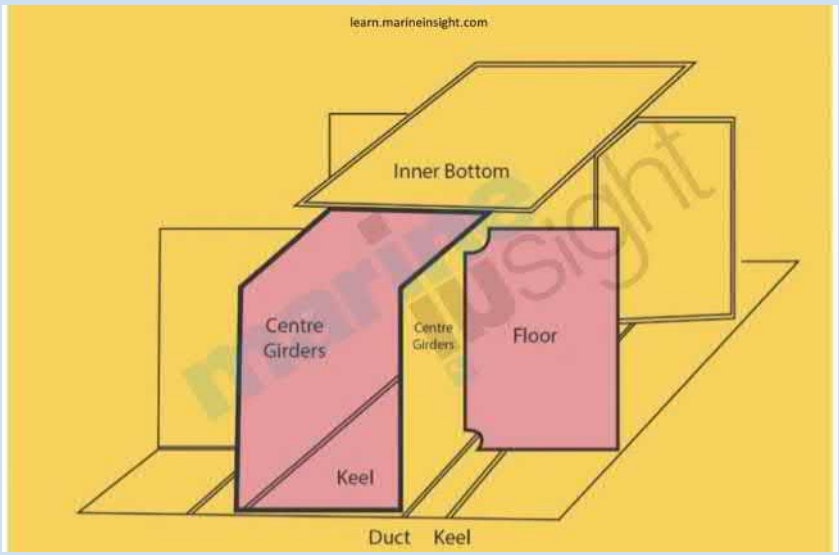


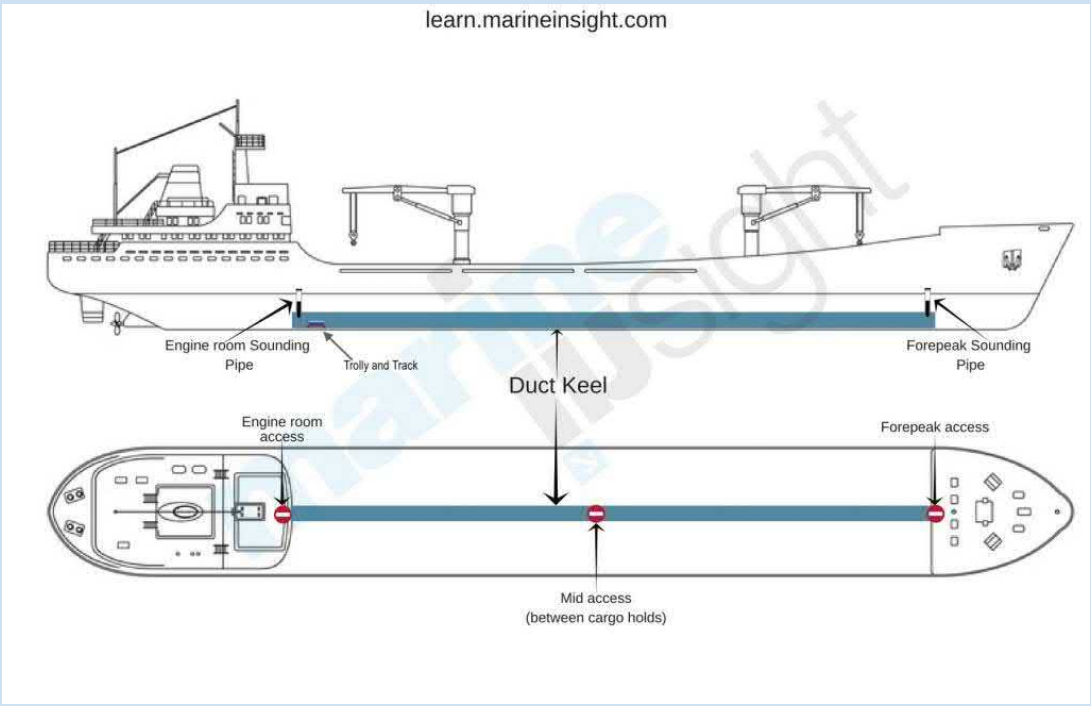
Bar Keel A steel bar is placed at the centre of the keel called bar keel. It consists of a bar which is supported by frames running around the vessel. It was used primitively when shipbuilding changed from wood to steel. The bar keel is made up of a flat steel bar or a steel plate of depth and thickness built to classification society requirements. It is stronger and heavier than the flat keel. Steel plates on either side of the bar keel are known as garboard strakes.

It is found mostly on single bottom hulls supported by solid floors with or without centre keelson plate. It is less common on new ships and is more common on smaller vessels like ferries, tugs, and boats where grounding is more of a risk. Bar keel doesn't provide sufficient strength for large ships as there is no direct connection between the keel and the floors. Hence flat plate keels have replaced bar keels on large vessels.



Duct Keel Duct keel is provided in double bottom hull ships and consists of solid plates welded into a box shape, forming an internal watertight passage running along the length of the ship, usually from collision bulkhead to forward engine room bulkhead. It is formed by two longitudinal girders which should not be less than 1.83 m apart.



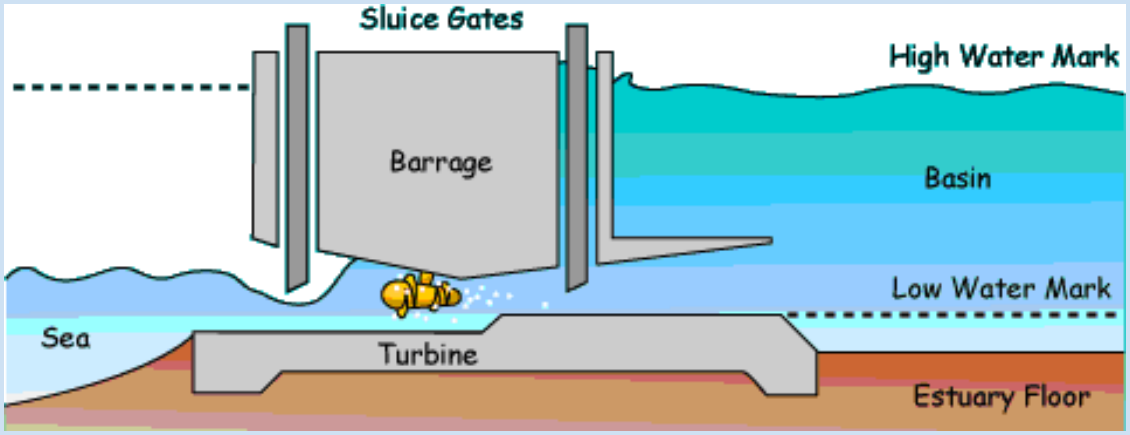


Acknowledgements: Marine Insight

Tidal Energy Advantages and Disadvantages

Using the power of the tides, energy is produced from the gravitational pull from both the moon and the sun, which pulls water upwards, while the Earth's rotational and gravitational power pulls water down, thus creating high and low tides.

This movement of water from the changing tides is a natural form of kinetic energy.



Tidal power is a known green energy source, at least in terms of emitting zero greenhouse gases. It also doesn't take up that much space. The largest tidal project in the world is the Sihwa Lake Tidal Power Station in South Korea, with an installed capacity of 254MW. The project, established in 2011, was easily added to a 12.5km-long seawall built in 1994 to protect the coast against flooding and to support agricultural irrigation.
A benefit of tidal power is that it is predictable. The gravitational forces of celestial bodies are not going to stop anytime soon. Furthermore, as high and low tide is cyclical, it is far easier for engineers to design efficient systems, than say, predicting when the wind will blow or when the sun will shin
Tidal power is also relatively prosperous at low speeds, in contrast to wind power. Water has one thousand times higher density than air and tidal turbines can generate electricity at speeds as low as 1m/s, or 2.2mph. In contrast, most wind turbines begin generating electricity at 3m/s-4m/s, or 7mph-9mph.

Advantages: longevity of equipment
Tidal power plants can last much longer than wind or solar farms, at around four times the longevity. Tidal barrages are long concrete structures usually built across river estuaries. The barrages have tunnels along them containing turbines, which are turned when water on one side flows through the barrage to the other side. These dam-like structures are said to have a lifespan of around 100 years. The La Rance in France, for example, has been operational since 1966 and continues to generate significant amounts of electricity each year.

Disadvantages of tidal energy: lack of research
While the true effects of tidal barrages and turbines on the marine environment have not been fully explored, there has been some research into how barrages manipulate ocean levels and can have similar negative effects as hydroelectric power. "The ocean's natural ebb and flow can be an abundant, constant energy source. But before we can place power devices in the water, we need to know how they might impact the marine environment," said PNNL oceanographer Andrea Copping in a research paper.

Disadvantages: the impact of EMF emission

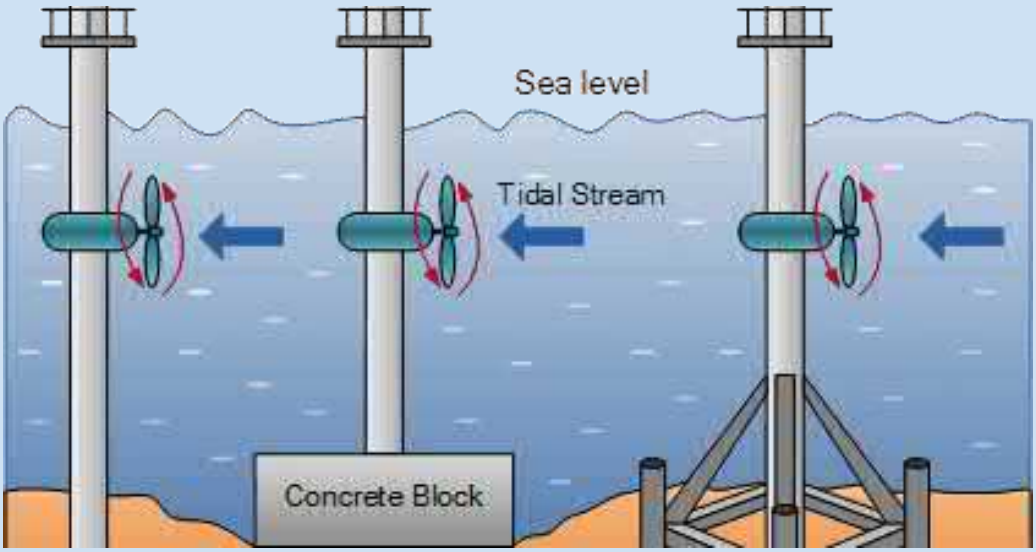
Particular species that are susceptible to EMFs are sharks, skates, rays, crustaceans, whales, dolphins, bony fish, and marine turtles. Many of these animals use natural magnetic fields to navigate their environment.

Disadvantages: high construction costs

Firstly, installing a tidal system is technologically challenging. Manufacturers are competing against the moving ocean, and the equipment and technical knowledge needed to successfully construct the system is typically very expensive, especially compared to a wind or solar farm.

The second expense relates to the point made in the previous section. Companies managing a tidal power system need to conduct continuous analysis into the effect it has on the specific environment in which they are operating. This requires research and assessment from environmentalists, marine biologists, and geographical experts to mitigate the destruction of sensitive ecosystems, which can be costly.

At some point, all the easy, cheap installations for wind and solar will be done. And then it's ocean energy that's next in line



Three more ways of bedding a system

Acknowledgements: Talal Husseini

Why the Shipping Industry Is Betting Big on Ammonia

Ammonia is a simple molecule, composed of three hydrogen atoms bonded to a single nitrogen atom. Today, most industrial hydrogen is produced using an energy-intensive method called steam methane reforming, which causes the methane in natural gas to react with steam and releases hydrogen, carbon monoxide, and a small amount of carbon dioxide. Nitrogen is mainly produced by cooling air to separate it into its constituent gases: nitrogen, oxygen, argon, and carbon dioxide.

To make ammonia, hydrogen and nitrogen are reacted with a catalyst at high temperature (about 500 °C) and high pressure (20 to 40 megapascals)

To be stored in large quantities, ammonia can be liquefied by putting it under pressure (about 1 MPa at 25 °C) or refrigerating it (to –33 °C).

If ammonia is to play a part in reducing maritime emissions, the fuel must be made in a cleaner way. For example, the hydrogen can be made through electrolysis, splitting water into hydrogen and oxygen using electricity from a renewable source such as wind or solar power. Renewable energy can also be used to separate nitrogen from air.

Ammonia Molecule

Boosting fuel supplies and building fuel-distribution infrastructure are the biggest challenges to ammonia-powered shipping .

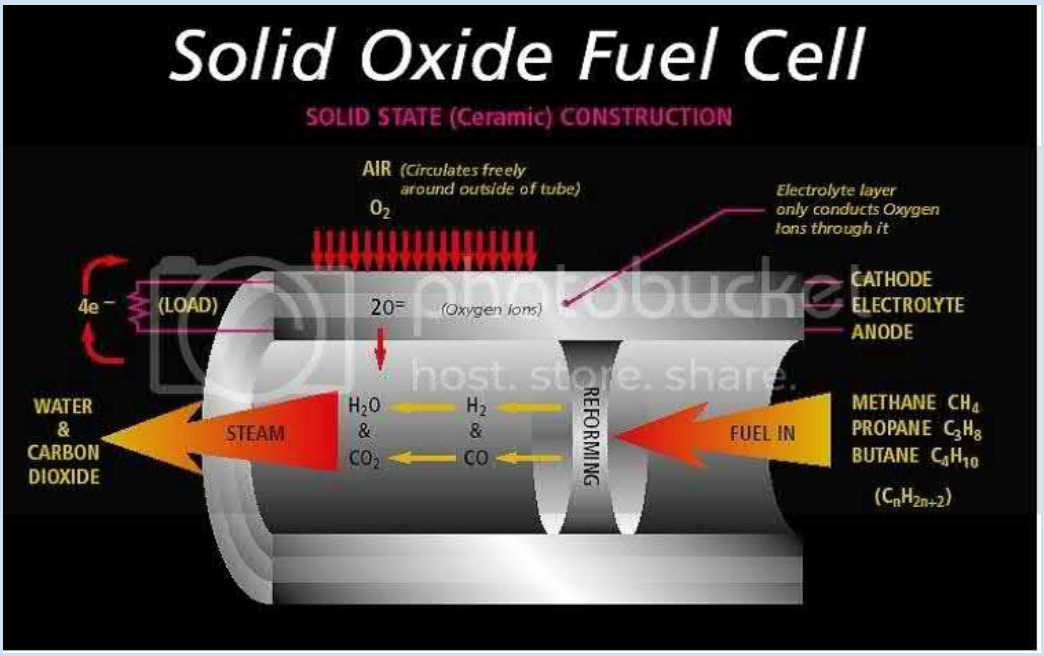
Only tiny amounts of green ammonia are now being produced .A trial plant in Japan uses solar power and water electrolysis to produce 20 to 50 kilograms of green ammonia per day.

As green ammonia slowly scales up, the shipping industry will have to solve some other problems. The top concern is ammonia's toxicity. In concentrated form, the pungent, colourless gas can be deadly. To use ammonia fuel, ships will need additional safety equipment, such as emergency ventilation and gas-absorption systems.

Fortunately, operators of chemical tankers already have experience handling ammonia. About 10 percent of annual production is transported by sea. These ammonia tankers may be among the first vessels to use the chemical for fuel, in the same way that today's liquefied natural gas carriers burn some of their own cargo while sailing.

Ammonia is also corrosive to some alloys containing copper and nickel and to some plastics. The fuel is difficult to ignite and doesn't sustain combustion well. Engineers could solve the ignition problem by combining ammonia with a liquid pilot fuel, such as diesel, though that would boost the ship's carbon footprint. Or they could potentially combine it with better-burning liquid hydrogen; that would require adding hydrogen tanks or equipment to separate hydrogen from the ammonia as needed.

Air pollution from burning ammonia presents another puzzle for engineers to solve. When burned at high temperatures, ammonia produces nitrogen dioxide, which contributes to smog and acid rain and can harm people's respiratory systems. Combustion also yields small amounts of nitrous oxide—a greenhouse gas that's significantly more potent than carbon dioxide and methane. If necessary, shipbuilders could install special equipment, such as for selective catalytic reduction, to avoid such outcomes. Another option for eliminating harmful emissions is to use fuel cells rather than an internal combustion engine. In simple terms, a fuel cell converts chemical energy into electrical energy without burning the fuel, thus avoiding the release of harmful gases or particles into the air. Although existing fuel cells don't have an adequate power capacity for ships, experts believe the devices will eventually be able to provide a higher efficiency and lower emissions profile than internal combustion engines. Researchers say a better fit may be the solid-oxide fuel cell, which uses a solid ceramic material such as zirconia as the electrolyte. These devices can operate at high temperatures of about 1,000 °C.



In the near term, fuel cells are expected to play only a complementary role on ships, supplying electricity for auxiliary systems and navigational equipment. If developers can scale up the technology to propel large ships and bring down manufacturing costs, fuel cells could eventually provide the least expensive way to operate ammonia vessels,

All of the forecasting and speculation around ammonia, fuel cells, and the like assume that the shipping industry will embrace such climate-friendly approaches.

Regulators will need to compel, not just encourage, companies to eliminate greenhouse-gas emissions. There is a need for policy-driven objectives to decarbonize the shipping industry .

This colourless fuel (ammonia), emits no carbon dioxide when burned. It's abundant and common, and it can be made using renewable electricity, water, and air. Both fuel cells and internal combustion engines can use it. Unlike hydrogen, it doesn't have to be stored in high-pressure tanks or cryogenic Dewar's, and it has 10 times the energy density of a lithium-ion battery.

Acknowledgements: MARIA GALLUCCI

News Snippets

1.Britain's navy has rejected a plan to turn away boats illegally carrying migrants to its shores when it takes over responsibility for trying to stop people crossing the English Channel in small dinghies.

2.An oil production and storage vessel exploded off the coast of Nigeria with 10 crew members on board though it was not yet clear if there were any casualties or how much crude might have spilled into the sea.

3.The Australian National Maritime Museum has announced a shipwreck found in Newport Harbour, off Rhode Island in the United States, has been confirmed as Captain Cook's ship, HMS Endeavour.

4.German propulsion specialist SCHOTTEL announced it is rolling out new digital products and services for optimizing ship operations.

5.Chief officer of bulk carrier İNCE EGE fell into water from pilot ladder while trying to read draft marks at Taman port, Russia, Black sea, understood early in the morning Feb 4, at night time. He was rescued 45 minutes later, but neither crew, no port paramedic, who was transported by tug, were able to resuscitate him, he, unfortunately, died. Understood the main cause of his death was hypothermia

6.The Norwegian Public Roads Administration has awarded the contract to construct and operate two hydrogen-powered ferries

7.Product tanker TORM EMILIE contacted embankment of southern breakwater in Kaohsiung Port, Taiwan, while shifting the berths, in the afternoon Feb 1. Ship's hull was breached, understood in ballast tanks area, followed by water ingress and a heavy starboard list. Tanker's carrying a cargo of naphtha, no leak reported

8.A Floating Production, Storage and Offloading (FPSO) vessel TRINITY SPIRIT with a capacity to process up to 22,000 barrels of oil per day, inject up to 40,000 barrels of water per day and store 2 million barrels of oil, has exploded and sunk at the Ukpokiti Terminal, around Excravos, Warri South-west, Delta State, Nigeria.

9.The Captain of the APL ENGLAND is facing charges resulting from a cargo spill in May 2020. The charges are filled by the Australian Maritime Safety Authority and are in relation to the Captain approving the operation of an unseaworthy ship. The captain, Mohd Zulkhaili Bin Alias, a Malaysian national, is currently on bail in Malaysia awaiting a trial date.

10.Japanese shipping company Mitsui O.S.K. Lines has stated that MV MIKAGE, a coastal container vessel operated by Imoto Lines, has completed its first unmanned port-to-port voyage of 161 nautical miles. Automatic flight drones carried the line from the vessel to the dock.

11.The container vessel Mumbai Maersk, which ran aground outside Bremerhaven on 2 February, has been safely refloated.

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Thankyou

The Editor..

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