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SIRE 2.0 – in OCIMF's words

OCIMF's new tanker inspection programme will prioritise risks, and combine technology with industry's increasingly advanced understanding of the human factors involved in tanker operations, writes Sam Megwa of OCIMF

By Sam Megwa, Programmes Director, OCIMF

Most tanker crew will be familiar with the Oil Companies International Marine Forum's (OCIMF) Ship Inspection Report Programme (SIRE) inspections.

Since the OCIMF inspection programme was launched in 1993, it has governed over 180,000 inspection reports, and has become a crucial tool for industry in vetting vessel quality and safety.

While SIRE remains a vital tool for industry, OCIMF recognised that safety improvement has plateaued. There was an opportunity to overhaul the programme so that it could take a risk-based approach and also provide significantly enhanced reporting outcomes. That would help industry to better address key issues of risk on board.

OCIMF's membership agreed the time was right to make the change.

Given the scale of the changes to the programme, we always envisioned the development of the new regime would take a few years.

Since 2018, through its Vessel Inspection Project (VIP) Steering Group and Working Groups, OCIMF has been working with its membership, programme participants and industry partners to reimagine the inspection regime. Also to develop significantly enhanced tools, processes and systems that will underpin the inspection process.

Following a comprehensive Management of Change (MoC) process, the new regime is now on course to be made fully operational in Q4 2022.

Vessel owners, operators, managers

and crew should be prepared for the new inspection process and should be engaging with OCIMF's SIRE 2.0 familiarisation and industry engagement programmes.

Static to dynamic questionnaire

By using a digital and dynamic questionnaire, the approach under SIRE 2.0 will significantly expand the depth and quality of marine assurance data gathered during vessel inspections.

This will allow for more in-depth reporting outcomes and comprehensive assessments of the quality of a vessel and its crew, on an ongoing basis.

How this works is largely down to the significant enhancements being made to the software that underpins the inspection process.

Tanker operators, managers and crew will notice significant changes to the way inspections take place.

On the whole, inspections will still last for approximately eight hours, and will be carried out by OCIMF-accredited inspectors trained in the SIRE 2.0 regime.

However, the paper questionnaires and clipboards carried by inspectors will be replaced with tablet devices loaded with specially developed software that can be used to conduct inspections in real time.

Paper format questionnaires will only be used under SIRE 2.0 as a contingency where a tablet cannot be used for any approved reasons.

As tanker crews will know, under the existing SIRE programme, inspections are



Sam Megwa, Programmes Director, OCIMF

conducted using a standardised questionnaire, in paper format, with assessments made in terms of 'yes' or 'no' responses, with negative observations reported in text.

Under SIRE 2.0, accredited SIRE inspectors will instead complete a Compiled Vessel Inspection Questionnaire (CVIQ) using the tablet device.

The CVIQ is compiled using significantly upgraded SIRE 2.0 software which uses an algorithm to select questions from a SIRE 2.0 Question Library. It is based on the type of vessel, its outfitting and operational history. It creates a bespoke risk-based inspection questionnaire.

The expanded question set covers questions classed in four ways.

Core - asked during every inspection and focused on risks that may directly lead to

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severe or catastrophic risk events;

Rotational - ad-hoc and focused on risks that may indirectly lead to severe or catastrophic risk events;

Conditional - unique to vessel, operator or ship type;

Campaign - a target area of concern for OCIMF members.

Static to graded feedback

Importantly, most questions on the CVIQ require the inspector to provide responses based on hardware, processes and human factors with observations graded from 'not as expected' through to 'exceeds expectation'.

Free text responses and use of images (where permitted) can support the inspector's observations, to give more context and clarity to what are often complex assessments.

This much more all-encompassing approach will help industry to better identify and address root causes of risk.

What's more, because inspectors will be using tablet devices to report, observations will also be supported with documentary and photographic evidence (where permitted) for the first time ever, ensuring greater transparency and objectivity throughout the inspection process.

It is important to point out that this does not make these inspections a punitive process; in fact, quite the opposite. Under SIRE 2.0 there is an opportunity to demonstrate best practices and recognise excellence, because for the first time, positive observations can be made.

Question library

The SIRE 2.0 Question Library and Supporting Documentation is available on the SIRE 2.0 section of OCIMF's website.

All tanker owners, operators, managers and crew are strongly urged to familiarise themselves with the documents and guidance as soon as possible and implement the necessary changes.

Advanced documentation

Information from the vessel operator will be required prior to the inspector's arrival onboard, reducing the pressure during the onboard inspection window.

Vessel operators will be able to submit documentation including a pre-inspection questionnaire (PIQ) and photos to document the vessel's standard. Also a Harmonised Vessel Particulars Questionnaire (HVPQ), crew matrix, Port State Control reports and incident data.

At OCIMF, we recognise the significant burden placed on crew as industry continues to evolve and adapt.

This is why every effort has been made to

ensure the SIRE 2.0 programme reduces the amount of administration carried out by crew during the onboard inspection.

Risk based

As the inspections are more comprehensive and risk-based, SIRE 2.0 should also – at the discretion of the report recipient – over time allow for fewer repeat inspections. It will provide a wealth of marine assurance intelligence that was not possible under the current SIRE programme.

All SIRE 2.0 programme participants will benefit from tailored, risk-based assessments which provide a far greater level of detail, context and evidence alongside a wealth of data.

This can be interrogated to find root causes to problems or patterns of risk across a fleet or vessel type, including issues related to human factors.

Human factors assessments

The focus on human factors is a significant change for industry.

There is widespread recognition that the human element is a key risk as well as a key risk mitigator across all aspects of operations. But there is still much work to be done in terms of addressing human risk factors.

By integrating human factors across the entire inspection process, SIRE 2.0 will significantly aid industry understanding of human factors issues and, we believe, tangibly improve support for crew.

As this is an area that is relatively new to both inspectors and crew, OCIMF has been delivering a programme of human factors training to inspectors within the SIRE 2.0 Inspector Transition Training Programme. OCIMF will provide familiarisation and guidance to vessel operators and crew in the lead-up to the launch of SIRE 2.0 in Q4 2022.

Conclusion

While the move to SIRE 2.0 will be a significant step-change for industry and the adjustment will take some time, the benefits will be long-lasting.

It will transform the marine industry's ability to understand and address issues of risk across tanker operations, and to become altogether better positioned to respond to evolving risks and changing regulations.

A range of resources and information about SIRE 2.0 is available on OCIMF's website, at <https://www.ocimf.org/programmes/sire-2-0>, including the full SIRE 2.0 Question Library and supporting guidance materials.

SIRE VIQ7 vs SIRE 2.0

What questions are included in the inspection?

SIRE VIQ7: The template is fixed to the vessel type and variants selected

SIRE 2.0: A CVIQ is compiled according to the HVPQ and PIQ. Questions are included according to OCIMF risk rating into 'core' (related to significant risk) and 'rotational' questions (not related to significant risk)

How are the questions structured?

SIRE VIQ7: A simple Yes/No response, with supplementary options for N/A or Not Seen

SIRE 2.0: Multiple categories of response for Hardware, Process, Human Factors and photograph validation

How does the inspector answer the questions?

SIRE VIQ7: Binary: positive or negative

SIRE 2.0: A graded scale of responses 'not as expected' to 'exceeds expectation'

What are the contents of a negative observation?

SIRE VIQ7: Free text observation contents

SIRE 2.0: One or more negative observations identifying a codified subject and nature of concern supplemented with free text

What forms of media can be added by the inspector?

SIRE VIQ7: Not supported

SIRE 2.0: Photographs can be taken to support question responses and negative observations

What data is provided by the vessel operator to support the inspection?

SIRE VIQ7: HVPQ, crew matrix, Port State Control (PSC) reports and incident data

SIRE 2.0: A pre-inspection questionnaire and vessel standard photography, plus HPVQ, crew matrix, PSC reports and incident data

TO

News from OCIMF – March and April

News from OCIMF in March and April includes observations on reducing piracy in Gulf of Guinea; plans to address shore power and carbon capture, and engine power limitation; and SIRE 2.0 inspector training

In its April 2022 newsletter, OCIMF noted that, according to International Chamber of Commerce International Maritime Bureau (IMB)'s report, Q1 of 2022 is the first quarter since 2010 when no crew kidnappings have been reported.

However, 23 crew were taken hostage and four crew were threatened.

There were 37 piracy incidents in the first three months of 2022, compared to 38 in the same period last year. 41 per cent of them were in Southeast Asian waters.

There is a "welcome decrease in reported incidents in the Gulf of Guinea region with seven incidents reported since the start of the year," OCIMF wrote.

"That said, the West African region remains dangerous to seafarers as evidenced by the hijack of a product tanker off the coast of Ivory Coast on 24 January, during which all 17 crew were taken hostage."

Environment committee

The Environment Functional Committee met in March 2022. Goals agreed were to develop a publication on the use of shore power and carbon capture; and to develop a publication on the risks associated with engine power limitation, minimum power guidelines and speed reduction zones.

Also, to participate in the review of the Offshore Vessel Inspection Questionnaire (OVIQ3); and to follow up the submission and the discussion about Volatile Organic Compounds on the Pollution Prevention and Response Sub-committee of the IMO.

Recognising Mayte Medina

Karen Davis, director of OCIMF, wanted to "share a spotlight" on her friend and colleague Mayte Medina, chair of IMO's Marine Safety Committee since April 2021, who was recently knighted by Geneviève Jean-Van Rossum, Ambassador, Permanent Representative of France to the IMO, for her work in the maritime industry.

Ms Davis said she and Ms Medina were both cadets together in the United States Merchant Marine Academy (USMMA).

Ms Medina has been with the US Coastguard since 1999 and is currently Chief for the Office

of Merchant Mariner Credentials. Her role involves developing and managing legislative and regulatory issues concerning merchant vessel personnel and labour issues. This includes US compliance with the International Convention on Standards of Training Certification and Watchkeeping for Seafarers (STCW), and the Maritime Labour Convention (MLC).

Together in Safety

OCIMF said it is supporting an industry consortium "Together in Safety". This is, it says, a "a non-regulatory industry consortium connecting the maritime sector with the common purpose of working together to improve safety performance."

"I encourage you to take a look at their website <https://www.togetherinsafety.info> and consider how the tools and resources might fit with and build upon your own company safety framework," said Karen Davis, director of OCIMF.

Inspector training

OCIMF held its first face-to-face courses for SIRE inspectors, in Rotterdam in April, with a refresher course taken by 28 inspectors, and a new inspector course taken by 17 inspectors.

Guidelines for offshore

OCIMF has joined the steering committee for a group called Guidelines for Offshore Marine Operations (GOMO), which "encourages good practice and safe vessel operations in the offshore energy sector."

Its guidelines replace a June 2009 document "Guidelines for the Safe Management of Offshore Supply and Rig Move Operations (NW European Area)." See www.g-omo.info

Piracy

OCIMF participated in the 16th Governing Council meeting of the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP) Information Sharing Centre.

At the meeting, data was presented showing there were 82 incidents of armed robbery against ships reported in Asia in 2021, comprising 77 actual incidents and 5 attempted incidents. This represents a decrease of 15% compared to 2020.

However, there was an increase of incidents in the Singapore Strait, mostly in the eastbound

lane of the Traffic Separation Scheme. It said the threat of abduction of crew in the Sulu-Celebes Seas remained high.

HVPQ6

OCIMF is working closely together with the Chemical Distribution Institute (CDI) to complete revisions to version 6 of its "Harmonised Vessel Particulars Questionnaire", HVPQ6.

It was released to industry on Apr 6 together with technical documents, to help companies make the transition from the HVPQ5 version. The transition must be completed by Jan 9, 2023.

HVPQ6 will be available in both Excel and pdf. Digital tools are being developed to ensure accurate data transfer from HVPQ5 to HVPQ6.

New staff

OCIMF has appointed Kevin Coelho as Nautical Adviser on a three-year secondment from Shell. He is a master mariner who has sailed on a variety of tankers and LNG carriers. He has also worked with Brunei Shell Petroleum as an Offshore Marine Operations Supervisor; for Shell Shipping and Maritime as a Marine Facilities Advisor in the Ports and Terminals department and in a Global Maritime Assurance role; for Shell Australia as the Terminal Team Lead onboard Prelude FLNG.

Aaron Cooper has joined OCIMF as Programmes Director on a 3-year secondment from Chevron. He is a master mariner who has worked in the oil and gas industry for 29 years including 16 years at sea, then in various shore roles with Chevron, up to Marine Assurance Manager (Americas) based in Houston, Texas.

Symonne Cupidore-Roeg has joined as Publishing and Communications Manager providing maternity cover for Kelly Hadley. She has 10 years of scientific, technical and medical publishing sector experience.

Mehdi Kootiarab has joined the SIRE 2.0 Project Team as a Contracts and Procurement Consultant. He has 25 years' experience in all aspects of the supply chain, including as senior buyer for Saipem and procurement specialist for Saudi Aramco. He will be involved in procurement related to SIRE 2.0 including tablet computer supply and support contracts, and development of a back-up plan with alternative managed service providers.

Columbia - seafarer recruitment challenges and SIRE 2.0

We talked to Captain Leonid Zalenski, chief operating officer and group director marine of Columbia Ship Management, about how he sees the challenge of seafarer recruitment, and what SIRE 2.0 means for a shipping company

Finding seafarers “is the biggest challenge for the entire industry,” says Captain Leonid Zalenski, chief operations officer and group marine director of Columbia Ship Management.

Capt. Zalenski is Group COO in charge for the entire operation of Columbia Group (one of the world’s largest shipmanagement companies, with 15,000 employees. He also represents Columbia in various industry forums, including INTERTANKO, the Loss Prevention Committee of Norwegian Hull Club, and Marine Committee of Cyprus Shipping Chamber.

The Ukrainian war has made the seafarer recruitment problem much bigger, he says. The world seafarer pool is about 10 per cent Russian and 4.5 per cent Ukrainian, and the make-up of Columbia’s pool is similar.

As of May 2022, Ukrainian males aged 18-60 are not allowed to leave the country. This means that Ukrainian crew who were onboard when the war started will complete their contract of employment (unless they want to go home earlier), but after going home to Ukraine, will not be able to leave for a further voyage, while the rule lasts.

The interview was conducted in late March 2022, a month after the conflict started, which meant that crew shortage problems had not yet kicked in, but were imminent, and there was no indication of how long the conflict would continue. “We tried to take a proactive step and get ready for a potential shortage,” he says.

Most tanker operators are in a similar same situation, although the nationalities of their existing seafarer pools will vary.

With 15,000 seafarers in its pool, and with a worldwide infrastructure of crewing agencies and in-house training, Columbia should be in a stronger position to find and develop new crew. “Obviously the challenge for us is less than for the smaller players,” he says.

“Many companies including ourselves are exploring the alternatives - Georgia, Latvia, Romania, Croatia, Philippines, Korea, India and so on.”

Columbia has set targets for its crewing agencies in some countries to increase recruitment by 10 per cent over the next few months. It has sent senior staff to these countries to talk to potential seafarers, including Capt Zalenski and the company’s group chief commercial officer. This helps promote the company as an employer of choice.

It is trying to do more to help its existing pool of seafarers advance faster up the ranks, such as through additional training. There are



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advantages to being able to promote internally, because seafarers already working with Columbia will have familiarity with the company and its management systems. “This is an important factor, we need to balance this as well,” he says.

Columbia is reviewing its training arrangements, to see if more training can be done onboard vessels, rather than taking crew away to classrooms.

For tankers, OCIMF’s ‘qualification matrix’, the requirement that crewmembers need to have a certain amount of experience at their current level, adds to the recruitment complexity.

“This is a challenge for the entire industry, companies will struggle with compliance with the qualification matrix.”

INTERTANKO has asked OCIMF members to take the shortage of seafarers into account and find a ‘pragmatic’ approach to when screening vessels for business, always maintaining safety standards through implementation of additional risk mitigation measures, Capt. Zalenski says.

The final decision about which vessels to accept is made by individual member companies, not OCIMF, and companies have different business needs and risk appetites. “We expect it will be case by case,” he said.

It is good for oil companies and INTERTANKO to have “a common understanding of the potential problems of the industry,” he says. “We hope we can find the right solution.”

SIRE 2.0

SIRE 2.0, the second version of OCIMF’s SIRE (Ship Inspection Report Programme), is “a revolution change of the inspection process for the tanker industry,” he says.

Captain Zalenski is a member of INTERTANKO’s vetting committee, and a member of a group discussing how SIRE 2.0 should work and how shipping companies should best prepare for it.

OCIMF had been working on the revision for several years and planned to release it in April 2022. The release is now postponed to the end of the year, probably October 2022. The delay was due to the “shortage of time for preparation,” following several meetings with OCIMF and tanker operators,

“The details of the program were released to industry in January only. Time was not sufficient to get ready.”

SIRE 2.0 is “a completely different concept to the current SIRE system,” he said. “It will focus on processes, equipment and the human element.”

“OCIMF did a fantastic job in creating a completely new system, which will bring the industry to a higher level of safety. It is very exciting to see how this is going to work. But there are a lot of challenges for the entire



Captain Leonid Zalenski, chief operating officer and group director marine of Columbia Ship Management tanker industry.”

From a tanker operator’s perspective, it needs to adjust its management systems to be sure it can satisfy the SIRE 2.0 requirements. There may need to be additional training for shore-based and sea- going personnel. “We need to do a lot of homework in order to get ready for this new system,” he says.

OCIMF has done several trials with companies to see how the system would work. These trials have all been done on a confidential basis, because it would not be fair if a ship was determined to be unfit for charter based on an inspection system which was not yet working properly.

“They want to implement the system in a way that really helps enhance the quality of operation,

rather than creating troubles,” Capt. Zalenski said. “This approach is highly appreciated by us.”

The previous SIRE system could be described as a snapshot of the vessel’s condition at the time of inspection. “The inspector comes onboard, reviews the various operational condition of systems, he checks how certain processes are implemented and that’s it,” Capt. Zalenski said.

But the new system, in contrast, aims to look at the whole working process onboard, including the human element of the operation.

There is a “pre-inspection” element, where a company will upload documents to the OCIMF system for review in advance. Inspectors will no longer review documents while onboard the ship.

This means that when inspectors are onboard, they will spend the time interviewing the crew, and getting an understanding of how the human element is managed. The inspector will be able to look at equipment, processes and the human element together.

The system has several levels of questions - core questions and rotational questions. “For each inspection the system will generate a ship specific set of questions.”

This means the crew will not know what questions they will be asked. The questions will be something specific relating to the ship.

The shipping company will need to prepare the crew for the interview with the inspector. This may be challenging for some crewmembers. “During the interview, you have 10-15 mins to explain what you do, how you do it and why. Not everybody can demonstrate certain things in the way they should [although] they may be a fantastic executor,” he said.

“OCIMF did a good job in preparing training modules [for crew]. They are not released to the public yet; they will be released very soon. I hope this will help companies to be better prepared for the big challenge.”

The changes to SIRE should make the inspection more objective, Capt. Zalenski says. Although, “we still have to see how it’s going to work in practise.”

The previous system was sometimes criticised for being too subjective. “An element of subjectivity will [still] be there, we are dealing with human beings, dealing with people,” he said.

Another benefit of SIRE 2.0 is that TMSA and vessel inspections will be more tightly integrated. “At the moment, TMSA lives its own life separately from the vessel process,” he says. “With SIRE 2.0, the TMSA element will be integrated in the vessel inspection process.”

Good for industry

Captain Zalenski considers OCIMF’s work to be very positive for tanker shipping and for other sectors of shipping, if ship management companies decide to manage all their vessels to the same standards, and these standards have now been forced up.

“I’m old enough to remember the pre-SIRE time, when vessels were operating under standards set up by individual companies. The implementation of SIRE in 1993 [meant] setting a standard for the entire tanker industry. It increased overall safety on the tanker fleet.”

“We consider that anything that is good for tankers is [also] good for the non-tanker fleet. We are talking about a basic safety arrangement, SIRE [driving] a standard of operation, which helps us to drive the safety of operation in the rest of our fleet.

“When it comes to SIRE 2, when we implement it, it will equally apply to all vessels of our fleet.

A better understanding of mental health

Three projects to better understand seafarer mental health and wellbeing are the Mission to Seafarers' Seafarers Happiness Survey, its WeCare programme, and OTG's e-learning for mental health and wellbeing

The Seafarer Happiness Index is a quarterly survey undertaken by the Mission to Seafarers, which asks seafarers what they are thinking, feeling and experiencing at sea.

It is a means for shipping companies to monitor wellbeing of the world seafarer fleet as a whole.

The intention is to 'pull out' issues which are particularly affecting seafarers, both professionally and personally; also to see what is working in making them feel better, said Steven Jones, editor of the Mission to Seafarers' Seafarers Happiness Index. He was speaking at a webinar organised by OTG on March 24.

"Hopefully we're able to build a useful picture of seafarers' experience, so we can build on positives and tackle the negatives," he said.

A general picture seen in survey results sent around the time of the webinar was that communications facilities with home is

improving.

Seafarers enjoy posting pictures from their voyages on their Facebook page, like sunrises and sunsets, and pictures of remote parts of the world, he said.

Although seafarers have almost given up on being able to get any shore leave (leaving the vessel to go ashore during port calls).

When everything gets bad, the shipboard catering becomes more important in keeping seafarers happy, including the social interaction around it, he said.

There is some improvement in how seafarers feel about their training, with the pandemic opening doors to more online training.

There are issues of recruitment and retention, often linked to seafarer wages. Seafarers compare their wages with other employment options, and consider how much they are able to buy with it, as the cost of living in many countries rises.

Many seafarers have mentioned "6 [hours] on,



Steven Jones, editor of the Mission to Seafarers' Seafarers Happiness Index

6 off" shifts, as being "incredibly challenging and exhausting".

"There's a sense of surreal disengagement from everything when you've worked a few days

into these shift patterns," he said.

Tensions onboard seem to be associated with drops in happiness. There have been reports of conflict between Russian and Ukrainian crew onboard. After the war broke out in February 2022, initially crew tried to be professional and show they could work together. "That



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unfortunately is being eroded.”

Russian crew have been receiving a version of the war from Russian news outlets, and Ukrainians are seeing the impact on their home. “No wonder tensions are struggling. I suspect that will be a real problem area,” he said.

E-learning about wellbeing

Maritime learning company Ocean Technologies Group (OTG) has developed a free training package for seafarers, together with the International Seafarers Welfare and Assistance Network, called “Seafarers’ Mental Health and Wellbeing”.

It is designed to show how they can improve their wellbeing onboard.

While there is much about onboard life which is beyond anyone’s control, such as crew change restrictions due to Covid, people do have a level of control over their behaviour and responses, said Catherine Logie, director of direct-to-consumer services with OTG.



Catherine Logie, director of direct-to-consumer services with OTG

Learning how to do this “is a form of skills training,” she said. For example, “helping people to move from reacting negatively to responding constructively.”

The OTG materials also suggests topics which seafarers may want to discuss between each other, either on person (onboard) or online.

“Discussions about wellbeing can be quite sensitive,” she said. “We’re trying to destigmatise conversations about mental health. It is taboo in some cultures.”

Some people prefer to study by themselves, rather than discuss mental health with others, and the materials allow this, she said.

It emphasises “resilience”, which can be an important personal quality in times of uncertainty. There are sections entitled ‘keeping things in perspective’, ‘change is a part of living’, ‘dealing with a crisis’, and ‘how to take care of yourself.’

Fatigue and stress are also covered. These are “very common but silent hazards,” she said. “They can gradually reduce an individuals’ performance over time.”

But a company may only be aware that seafarers are fatigued or stressed after an incident happens.

Another issue which may affect crew is post traumatic stress disorder (PTSD) for example after crew have been involved in a pirate attack, or seen a fatality onboard.

Not everybody who experienced trauma will experience PTSD, she said. It requires special diagnosis from trained professionals.

OTG has a course on cultural awareness which looks at how to work with other cultures.

Onboard culture makes a big difference to how seafarers feel. They do not choose who they live with, and crew are often from mixed nationalities, and have different behavioural codes of what is acceptable, she said.

“We don’t need to change ourselves to fit in with another culture’s beliefs. But in working in a ‘just safety culture’ we have to keep an open mind and respect for other people,” she said.

“Seafarers are some of the most experienced people I’ve ever met at working with different cultures.”

“Particularly when under stress, we tend to revert to our own cultural norms. That can increase the sense of isolation onboard.”

The course covers conflict management. “Conflict is not necessarily bad, it can act as a form of release. But it can create problems for the team and for employers,” she said.

Conflicts were made more unpleasant when crew were not able to leave a vessel due to Covid, she said.

The course discusses how physical health and nutrition can contribute to good mental health. It has advice on staying fit onboard, even when limited facilities are available. It covers the effect of alcohol and caffeine and need for proper hydration.

There are cooking skills videos, and tools to help with menu planning, including with dishes from around the world. There is some training on sanitation and hygiene.

There are sections on “cyber wellness” – staying mentally healthy while using digital tools.

“While increased connectivity is something all crews want, it does make challenges - increasing isolation, maybe affecting concentration time, and (decreasing) rest time if people spend a lot of time on screen,” she said.

The course shows why screen time can become addictive and shows practical ways of staying in control.

WeCare Programme

The Mission to Seafarers has developed the “WeCare Programme” to promote positive mental health and wellbeing for seafarers across the world.

It has a course on financial wellbeing, also looking at how money concerns can affect mental health. It shows ways to manage money when at sea, including making a budget or saving plan with family members.

There is also a course on social wellbeing, including maintaining long distance relationships when at sea. This includes advice on how to react to any difficult situation which arises at home.

The Mission to Seafarers aims to provide access to the program to over 100,000 seafarers and their families. A goal is to ‘normalise’ the idea that talking about mental health is acceptable and not a stigma, said Thomas O’Hare, Programme Manager for WeCare.

Here are some comments from participants. “After completion of the course I felt an

improvement in the way I communicate onboard and also at home’, ‘very nice training. I learn a lot even if I’m not using the social media so often’, ‘the good techniques of star and 4-7-8 are fantastic’; the subjects [are] relevant, training materials [are] easy to navigate, curriculum challenging and ready to use in my life.’

“We want to drive new partnerships with ship management companies to extend the number of seafarers who are accessing this course,” Mr O’Hare said.

Measuring effectiveness

Speakers were asked how they can measure the effectiveness of these programs.

Mission to Seafarers’ Steven Jones noted that happiness is subjective, and people answer questions in different ways. But it can also be helpful to see the answers quantified, such as whether happiness ‘scores’ are going up and down.

OTG’s Ms Logie added, “it is difficult to measure subjective feelings. You can look at hard facts [such as] an improvement in safety. But sometimes it’s about sensing the atmosphere onboard, what crew tell you [about] if the vessel is a harmonious place to work. Some of these things don’t boil down to data.”

“If we’re serious about putting people first, sometimes we just need to listen to the stories people are telling us and get the measure from crews themselves.”

“For us, we have the luxury having chaplains all across the world who go onboard ships and have those discussion,” said the Mission to Seafarers’ Thomas O’Hare. “We can see the difference between seafarers onboard, what knowledge and understanding they have of coping strategies. On a qualitative basis, it’s about looking at feedback we receive after courses. You can only get so far with that.”

Pressure

It is important that seafarer surveys are done confidentially though, because people may feel under pressure to say they are happy when they are not, if they know someone will see their name next to their response.

“There are dangers that seafarers perhaps feel under pressure to maybe portray something different to what is genuinely being experienced,” said Mr Jones.

“That’s something we’ve had for decades, seafarers muddling through, trying to conceal problems, they get confused about whose side anyone is on.”

“[Imagine] a seafarer who is perhaps feeling suicidal, put on the spot by an auditor / surveyor and asked, ‘is life good onboard.’ They say yes, because the last thing they want is the pressure of the ship failing and the sanction that comes with that.”

“We have to be really careful and understand it is people, their emotions, their reality and their life.”

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EU ETS costs, alternatives to slow steaming

Mike Servos of Minerva shared his estimates for the costs of EU ETS per voyage, the best way to improve your CII scores other than slow steaming, how to improve performance as a business process, and the best way to work with data

Mike Servos, Energy & Environmental Manager of Minerva Group of Companies of Athens shared the company's estimates for the costs of the European Union Emission Trading Scheme (ETS). He discussed other EU rules FuelEU and the Energy Taxation Directive.

Mr Servos was speaking at a webinar on March 16 organised by Vessel Performance Optimisation, a sister company of Tanker Operator.

He discussed the most commercially viable ways to improve CII, including methods other than slow steaming. He outlined what a business process for improving performance looks like, and shared ideas about the best way to gather and analyse data.

Minerva Marine operates 5 VLCCs, 7 Suezmax, 27 Aframax and 18 MRs, Minerva Dry 11 bulk carriers while Minerva Gas has 5 LNG vessels according to its website. So, 73 vessels in total.

EU ETS

The EU Emission Trading Scheme (ETS) is "expected to have an immediate financial impact," he said.

The ETS scheme has been operating since 2005 in the European Union, where heavy industrial CO2 emitters are required to purchase permits to emit, at the current carbon price.

The maritime sector has not been covered by the scheme up to now. But from 2023, maritime is expected to be included, with companies (or their charterers) required to purchase credits for emissions for voyages calling at EU ports, with a phase-in period up to 2026.

The EU has made an initial proposal of how much of a ship's emissions would be included, and there is also a proposal under discussion which will include much more of a ship's emissions.

According to Mike's calculations, the cost of buying allowances under the initial proposal, for

a single round trip with an Aframax from the US to the Netherlands, will be Eur 39,600 in 2024, Eur 89,100 in 2025, Eur 136,000 in 2026 and Eur 198,000 in 2027.

Under the 'discussed proposals', this will rise to Eur 124,740 in 2024, Eur 249,480 in 2025, Eur 378,000 in 2026, with no further rises.

This is based on a carbon price of Eur 90 / metric tonne, although the carbon price may rise, Mr Servos said.

Maritime industry associations would like to see the carbon costs paid directly by the charterers, with charterers also taking the risk that the costs rise after the contract has been signed.

The charterer is making decisions which will impact the emissions, such as the choice of fuel, speed and cargo volume, so it fits that the charterer would also directly pay the ETS costs, Mr Servos says.

Other EU rules

Another incoming European Union regulation is "FuelEU maritime" which sets gradually tightening limits of greenhouse gas intensity of fuels for vessels operating in the EU economic area.

This is designed to be calculated on a 'well to wake' basis, so include emissions from the transport and distribution of fuel to the ship.

A further hit comes from the EU's Energy Taxation Directive, which proposes a tax on heavy fuel oil, of 0.9 Eur per gigajoule, or 37-39 euros / metric tonne of fuel for voyages in the EU. LNG and LPG see a reduced tax of Eur 0.6 per gigajoule or Eur 29 per metric tonne, but only until 2033.

IMO rules

These measures go alongside the IMO's measures. EEXI, in Mr Servos' view, "practically introduces a speed limit, and is expected to impose barriers in trading from a significant number of ships," he said.

"The majority of the existing fleet will



Mike Servos, Energy & Environmental Manager of Minerva

experience a reduction in engine power, by engine power limitation or shaft power limitation."

IMO's Carbon Intensity Indicator (CII) generates a rating for each ship from A to E, based

on data submitted with the IMO DCS (Data Collection System for fuel oil consumption). Corrective action is required for ships which get an E rating in a single year, or a D in 3 consecutive years.

A number of correction factors are under discussion, for emissions from ice class vessels, shuttle tankers, refrigerated containers, and tanker cargo handling. But at the time of the webinar (mid-March 2022), "we still don't know if this is going to be finally adopted," he said.

CII will lead to a number of commercial and legal issues, he said. For example, whether the charterer or owner bears the cost and responsibility of complying with CII for vessels under a long-term charter, which continues into the time when CII begins (Jan 1, 2023).

Also, under the terms of the charter party, owners of time-chartered vessels must comply with charterers' orders, such as for speed. But if these orders affect the CII rating, does that oblige owners to comply with them?

If owners make a decision to slow steam or deviate from the requested route, in order to maintain the CII rating, could that put them in breach of the charterparty obligations to proceed with 'due despatch' and make them potentially liable for damages?

Don't rely on slow steaming

Companies should not rely on slow steaming to stay in CII compliance. To illustrate, Mr Servos presented data from a vessel which is rated a 'D' in 2024. In order to get into the 'C' band, it needs to reduce carbon intensity by 5 per cent. Mr Servos calculates this would mean reducing speed by 4 per cent.

A 4 per cent speed reduction means reducing from 12 knots to 11.5 knots. But that may not be commercially viable. Consider a vessel trading between China and Australia, normally making 10 round trips a year, it would now only be able to make 9.5 round trips. This means the shipowner makes less money.

Other ways to improve

Tanker operators may instead benefit from making improvements in how they consume fuel on the vessel.

Looking at an Aframax tanker with steam powered cargo pumps and ocean crossing voyages, Mr Servos calculates reductions in total fuel use of 15.9 per cent are available, from doing everything possible to improve hull and propeller efficiency; improving voyage planning; improving the efficiency of main engine; improving trim and balance; optimising electricity generation and steam production onboard.

A further 6.4 per cent reduction in total fuel use is available from optimising port operations. 1.7 per cent reduction is available from optimising operations at anchorage or when drifting. This adds up to 24 per cent.

Most of the available port operations savings are from discharging (5.4 per cent) so this may be the biggest area which has not yet been tackled. (Although it is possible that discharging emissions will be excluded from the CII calculation as a 'correction factor', as mentioned above).

Once shipping companies have reduced speed as far as they are able to commercially, these "technical efficiency" methods become more and more important, he said.

Business process

Improving vessel performance is a business process.

Mr Servos defined the steps as (1) identify the need; (2) identify stakeholders; (3) establish a reliable data collection system and get performance data; (4) establish the vessel's baseline performance; (5) develop tools which allow you to predict the impact on financial performance of various measures; (6) do a sensitivity analysis to see what impact various parameters will have; (7) evaluate.

A common problem here is that many tanker operators overestimate their progress with steps (3) and (4): the quality of their existing data

collection systems and their understanding of the vessel's current performance, he says.

Data gathering

"I would like to stress that IMO DCS [data collection system for fuel oil consumption] data alone is not sufficient to establish the performance baseline required, to have an effective decision-making system," he said.

You will probably need digital tools to gather and work with data.

Minerva built its own system from a mixture of in-house development and outsourcing development. "This allows us to have full ownership of the platform and customise it to business needs, giving us competitive advantage. [Building] it was a slow process, but it is worth the effort."

Minerva collects high frequency data from sensors on the ships, and integrates this with data from noon reports, and data from weather providers. It is able to ensure that validated data is always available.

"Many of the sensors currently onboard were not designed for the purpose for collecting the data."

if you make the proper selection of appropriate sensors from the start, that's 50 per cent of the work to be done," he said. "There are many products claiming that they can deliver the required accuracy, but at the end of the day, it's not [delivering]."

When it comes to crew, crew members who are 'online' (digital technology users) tend to adapt much faster to the instructions that they are given, he said.

"We experience significant improvement when it comes to operational measures that we need to implement on board the vessels. From discharging, or auxiliary load management. [Online crew] adapt much faster to these changes."

"They know that their performance is being monitored and evaluated."

Once data is gathered, there is a difficult task of cleansing the data, or to "identify outliers, or any other hidden malfunction within your data," he said.

Data analysis

The company did a lot of work on hull and propeller efficiency, which had been identified as the easiest way

to improve performance of a vessel. "It made sense to start from there."

It used data analytics to try to understand where improvements could be made and then cleaned the hull and propeller at the right time

As a result, "on a business as usual scenario we have managed to achieve a 6 per cent reduction in the daily fuel penalty attributed to fouling," he said.

Then the company invested in improving the efficiency of its cargo discharging operations, beginning by collecting high frequency data from pumps and steam systems. "We have managed to improve efficiency of discharge operations by 30 per cent over the last 2 years," he said.

There can be some debates with crew about whether it is necessary to keep a second generator running, if the data says it is not necessary, but the crew feel it is important for safety reasons, avoiding a black out from lack of power. "We never sacrifice the safety of the vessel in order to increase its efficiency, just to save a small amount of fuel. Whenever needed, the second generator would be running," he said.

You can watch Mr Servos' presentation on YouTube at <https://youtu.be/rLZcsiaqHYs>

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Charterer's perspective on carbon and tankers

From a charterer's perspective, one of the biggest challenges with decarbonisation are to get standardised data from all the vessels you use so you can see all their emissions per tonne mile, explained Risto Kariranta from Neste

One of the biggest decarbonisation challenges for tanker charterers is to gather data about all voyages, in terms of emissions per tonne mile. But this is a good starting point for working out ways to improve.

Risto Kariranta, Shipping Performance Manager, Fleet Operations with Neste gave a charterers perspective, speaking at a webinar on March 16 organised by Vessel Performance Optimisation, a sister company of Tanker Operator. Neste, based in Helsinki, Finland, is a supplier of fuels, plastics and chemicals, including biofuels and fossil fuels.

Drivers for decarbonisation

Charterers have multiple reasons for wanting to gather emission data and decarbonise, from regulation, customers, and its own internal drivers.

On the regulatory side, both IMO and the European Union rules are demanding better transparency of emissions, he said.

The customers, the purchasers of fuels, are asking for data about the full greenhouse gas footprint for transportation.

This is particularly important for provider of biofuels. A biofuel emits CO₂ when combusted like any other fuel; and it absorbs the same amount of CO₂ from the atmosphere when it grows. If that was all the carbon factors, it would be carbon neutral.



Risto Kariranta, Shipping Performance Manager, Fleet Operations with Neste

But its greenhouse gas footprint becomes positive due to carbon emissions from its farming, transport and processing. The fuel's premium value is justified by its semi carbon neutrality.

That is why accounting for and reducing transport emissions is so important.

Many charterers also have their own internal targets for reducing its 'Scope 3' emissions, which includes emissions from the transport services it buys, delivering feedstock to the refinery and product to customers, he said.

Data from vessels

The data which a charterer is able to obtain from vessels it charters depends on whether they are time-chartered (such as for a period of months or years), or spot chartered (taken for a single voyage).

For time-chartered vessels, the charterer pays for the fuel itself, so it knows exactly how much is being burned onboard.

For spot vessels, while shipowners may be asked to disclose fuel consumption to their customers, they don't do it "in a very consistent way," he says. It is not yet mandatory, or required in contracts, for shipping companies with spot charters to provide emissions data on a daily basis.

Groups such as the Sea Cargo Charter are working on the "finer principles" of emission data and its sharing with charterers, he said.

A major charterer uses a lot of shipping companies to transport cargoes, he said. But every shipping company has a slightly different reporting system."

For parcel tanker shipments, it needs to allocate the emissions from the whole vessel to each parcel, so it can estimate the effective emissions caused by each parcel.

So, for some vessels, charterers rely on estimations of fuel consumption. These can be generated by service providers such as NAPA, which has a performance model for every vessel in the world, based on data about actual operations of the vessel where available, and data modelling.

"It's not 100 per cent accurate, it's indicative enough to start," he says. If it is checked it against vessels where we the fuel consumption and the accuracy is known, "it is maybe within 5-10 per cent of the reality."

Translating data from the different formats of different companies into one standard, so data can be compared, takes a lot of effort.

Perhaps in future there would be a broker service, to take emissions data from shipping companies in whatever system they use and put it into the format which the charterer uses, he said. This would also make life easier for shipping companies, which currently see all of their charterers are asking for data in different formats.

Data can be initially gathered for a variety of different purposes, which means it isn't necessarily compatible with the vessel performance calculations.

An ultimately aim is to have data for every parcel of cargo, including the miles of the voyage, tonnes of cargo carried, the fuel consumption, a data quality estimate, the overall emissions, emissions per mile, emissions per tonne of cargo, and finally emissions per tonne mile.

Driving decarbonisation

With systems such as this, it is possible to aim for a certain reduction every year. With every completed voyage, a charterer can see whether it is on track to achieve that reduction. So, in one example, a baseline of 3 per cent reduction a year. If the charterer achieves emissions of 10.65 g/tonne mile, compared to 11 in the previous year, so a reduction of 3.18 per cent, slightly ahead of target.

It can also give its chartering managers CO₂ 'budgets' for the year, with demands that they need to take measures to keep within the budgets – and some measures are more costly than others.

For charterers, the "toolbox" to drive decarbonisation is different to a tanker operator. It can choose which vessels it charters, so it could choose a more energy efficient vessel, if it is available.

For time-chartered vessels, the charterer has the right to determine the speed, and also make re-arrangements for berths when the expected arrival time changes.

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But that doesn't mean that it is easy to determine the right speed and arrange for the vessel to follow the instructions. It "requires a lot of work, monitoring and communications," he said.

While it may not be appropriate for charterers to communicate directly with the crew, charterers can "definitely monitor what is happening with time-chartered vessels, about the performance, and how the vessels are doing, and what we could improve."

In time charters, the charterer has the right to determine which fuel is used, if there is a choice. "Soon there will be low carbon solutions for marine fuel available. Then we have to consider [their] use. We could start to estimate the cost of the carbon intensity reduction for each fuel."

For spot-chartered vessels, chartered for individual voyages, it is in both the charterer and shipowners' interest to use as little fuel as possible, although the shipowner pays for the fuel.

A charterer can also change the organisation of the cargo parcels to achieve efficiency, with different load and delivery ports. For the terminal in its own refinery, it is able to make the berth / jetty plan.

There can be many unexpected circumstances with jetty utilisation, requiring changes to plans. But CO₂ can be reduced if the updates are sent as soon as possible to the incoming vessels, for example saying the jetty timing has changed, here is a new recommended time of arrival, and this is how much fuel and CO₂ emission will be saved if you adjust your time of arrival based on that.

Normally, vessels do adjust their speed accordingly, he said. Vessels also spent less time at anchorage, where they would otherwise have been burning fuel.

This is easier to do with ports which the charterer actually owns, such as at its own refinery.

Data driven planning

Another tool is data driven planning. For example, "gathering statistics about our vessel port calls, how much time they are spending in the port," he said. This includes data about average loading and discharge speed, and average duration, for each vessel. "We have a long history of each vessel in the fleet."

With this data, it is possible to create models to predict how long a vessel will stay in the next port, based on the planned cargo amount, cargo operation, terminal, and vessel leg. It is not 100 per cent accurate but it is really good for planning purposes."

For time-chartered vessels, it is possible to analyse data of how much fuel the vessel consumed during the voyage in different conditions, which can be used for estimating fuel consumption on upcoming voyages.

There can be a transportation planning system for cargo parcels, which can compare different 'scenarios' or routing plans, based on the time they will take, the emissions, and the costs, based on estimates of both voyage time and port time.

"I think it's all about teamwork, getting these kinds of goals. You have to work quite a lot with the data and understand what it means. We have unlimited possibilities to learn from the data and find new ways to operate our fleet."

Data quality

Data quality can be hard work, he said. Typically a charterer "has to enforce processes that [ensure] we get more accurate data."

"We do not get always perfect data. It's a continuous issue, we can never reach the level that we have absolutely correct data."

Working with data can be very hard. "It's hard work. Step by step you learn your own data, how it is formulated, and how to combine that with each of the sources."

Christos Papandreou

Christos Papandreou, vessel performance consultant and former Efficiency & Fleet Performance Engineer with Athenian Sea Carriers, said in the webinar that the biggest challenges with fleet performance could be described as gathering quality data, choosing the right approach and model to work with it, then changing staff mindsets and convincing crew to do things differently.

The 'modern' approach to vessel performance is using big data and machine learning, with many more variables. It is suitable for route and weather optimisation, and creating models to predict vessel performance under different operating conditions, he said.

But people sometimes rely on the technologies too much. "Just dumping data and waiting for results is not going to work. There must be a robust methodology."

One of the hardest parts of improving performance is changing people's mindset, he said. For example, a market-orientated shipowner may want to only invest in ships when the daily rates are high. "It is impossible to convince them to invest in high anti fouling paints when the market is low, no matter what the return on investment," he said.

Although it is essential to be able to explain your complex models in "plain words" if you want senior management to make the investment decisions, he said. You also need to build trust in the models and procedures, including by making predictions which turn out to be correct, and showing comparisons between different vessels. People need to be able to see financial returns.

You can watch Mr Kariranta's presentation on YouTube at

https://youtu.be/fX8_9QrNt1M

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33 years on from Exxon Valdez

33 years after the Exxon Valdez disaster, two experts discussed how it has changed the industry, including requirements for emergency response services and double hulls, and changing global opinion about fossil fuels

The Exxon Valdez disaster in March 1989 spilled 36,000 tonnes of crude oil into the Prince William Sound, Alaska, spreading 1100 miles, leading to one of the costliest clean-up operations ever. A further challenge was removing 53m gallons (170,000 tonnes) of oil from the vessel.

It also drove big changes in the tanker industry, including the requirement for qualified individuals and emergency response services, double hulls, and arguably a change to global opinion about fossil fuels.

Two experts shared their reflections about the Exxon Valdez's influence on the past 33 years, speaking at a webinar held on the 33rd anniversary, March 24, 2022, organised by maritime crisis communications specialist Navigate Response.

The first speaker was Mike Gallagher, senior managing director, shipping and transportation, with Witt O'Brien's, a company which specialises in crisis and emergency management. At the time of the disaster, Mr Gallagher was working at the International Tanker Owners Pollution Federation (ITOPF).

The second speaker was Edward Ion, currently leader of the Asia office of Navigate Response, a crisis response agency, who at the time of the disaster was an insurance and finance reporter in London for maritime newspaper Lloyds List.

Mike Gallagher

The basic story is that the vessel left the terminal in Alaska at 11pm on a regular route, deviated from its planned course to avoid ice, and "forgot to turn back," said Mike Gallagher, senior managing director, shipping and transportation, with Witt O'Brien's.

"That's basically it".

The crew realised they were not where they intended when they were on the leeward (downwind) side of the Bligh reef. They tried to turn the vessel but ran aground.

Because the vessel had hit the reef at its normal cruising speed (considered a

'high energy grounding'), it was severely damaged. If it had been pulled off the reef, it would have likely sunk, so all of its cargo would have polluted the sea. So, the Coastguard insisted the vessel stay where it was, Mr Gallagher said.

But Exxon and the authorities were not particularly well prepared for an oil spill. They had oil spill containment strategies, but they weren't sufficient. The boom used was "really ineffective in terms of capturing much of the oil," he said.

The oil first hit Bligh Island itself, and then drifted up Prince William Sound with the currents, eventually hitting Kodiak Island, which is 1000 miles away. "You could fly a fixed wing aircraft for miles before you start seeing the leading edge of the spill," he said.

200 miles of shoreline needed clean-up, and another 1100 miles needed "some attention".

There is a large fishing industry in Alaska which needed to be closed. Most residents of Prince William sound were relying on fishing for their income, he said. This includes native Alaskans. The fishing vessels could instead be employed to do boom and oil spill response operations.

On the shore, the plan was to put boom in the water to stop more oil reaching the beach. Then to wash the beaches with cold water, including using high pressure water to push the oil back onto the sea, where it could be recovered using skimmers.

Alaska's Department of Environmental Conservation (DEC) requested hot water washing of the beach. But heating up the oil lowered its viscosity, which meant that it could flow down under the sand. "It looks good on the surface, but it was causing more harm than good," he said.

There could be disagreements between the state authorities and the coastguard, and continual revision of plans.

Altogether the shore work involved 11,000 personnel, 1400 vessels and 56 aircraft, and was "logistically very challenging," he said. "Bears are coming out of hibernation that time of year. They had to put bear watchers on each of these beaches with guns in case

there was a bear attack. The men and woman had to be put on ships at night to sleep. They brought in navy troop ships."

Jim O'Brien, founder of O'Brien's Group (which later merged to form Witt O'Brien's) was appointed manager of the spill clean-up.

The last 33 years

Over the 33 years since the incident, the maritime industry "hasn't had a high energy grounding," he said. "We've reduced the volume of spills substantially."

The following year, the US passed the Oil Pollution Act (1990), which requires that all vessels going to the US have a crisis response plan with a named "Qualified Individual".

The "Qualified Individual" must be someone who lives in the US, speaks English, is available 24 hours a day, and is authorised to, and able to, activate resources to respond on the shipping company's behalf.

These plans did exist before the Exxon Valdez, but they were "loosely co-ordinated", and requirements were not so strict, he said.

There is a requirement for shipboard exercises where the master calls the QI. Today, Witt O'Brien's provides this service to many companies, and fields 18,000 such calls a year, he said.

Once a quarter, vessels need to do a "notification exercise", where the master calls the QI, and the QI calls a SMFF (salvage and marine firefighting) company. Companies must hold shore exercises every year, involving their incident management team, the SMFF team, and deploying equipment.

There are 3 SMFF companies active in the US – Donjon-Smit, Resolve Marine, and T&T Salvage.

Companies are also required to nominate an Oil Spill Response Organisation (OSRO) which has equipment available.

Ed Ion – media response

Ed Ion, head of the Asia Practise for



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Navigate Response in Singapore, shared his experience, from working at the time as a journalist for Lloyds List maritime newspaper.

Lloyds List sent a reporter to Valdez, who discovered that the captain had been drinking before going onboard the ship. This was big news, as it was widely expected to be the root cause of the incident. "The mainstream media coverage was hijacked by demonising of Captain Hazelwood, framed in 'what do we do with a drunken sailor.'"

As an aside, it is worth noting that a year later, Captain Hazelwood was acquitted of the biggest charge, 'second degree criminal mischief', although he was convicted of a lesser charge, 'negligently discharging oil', with a fine of \$50,000, Mr Ion said.

It took a while for big news networks to send people and equipment to the town. If the disaster happened today, there would be TV reports with mobile phone images immediately, Mr Ion said.

The images of birds covered in oil were widely seen around the world. "It quickly became an iconic moment for environmentalists. Mr Ion says he has seen some of the images from the event hundreds of times.

Exxon's handling

"It's been said that Exxon's handling of the Valdez incident was a public relations disaster, which it was in many ways," Mr Ion said.

It could be summarised in Exxon's treatment of the captain and the behaviour of its CEO.

Exxon fired Captain Hazelwood before the court case had taken place to establish who was to blame. "They cut him loose in an effort to pin the blame on him. That backfired spectacularly. It also gave Captain Hazelwood a defence."

"We all know that shipping accidents are caused by systemic failure rather than the actions of an individual."

In the courtroom, "Captain Hazelwood was acquitted of the substantive allegations

against him. This made Exxon look worse."

A second error, in Mr Ion's view, was that Exxon's group CEO, Lawrence Rawl, decided not to personally visit the scene, even when he was fully aware of the extent of the disaster.

"He decided to send subordinates, some might say junior members of Exxon management. It appeared they weren't taking the event seriously. This enraged people on Capitol Hill, enraged the American public."

"I would argue the root cause of Exxon's public relations disaster is that it did not have a viable and tested crisis communications plan in place. Most of Exxon's comms campaign was reactive and defensive. This really affected Exxon for decades afterwards."

Today, although "we don't work for Exxon, we know that today Exxon has one of the best drilled and most sophisticated crisis communications plans as an oil major anywhere in the world," he said.

Vessel names

Following the incident, Exxon changed the name of their internal tanker operating company to "Sea River Maritime".

"Having the name [of the ship] associated with the company is not ideal."

Since the tankers are moving from one US port to another, they are covered under the Jones Act, which means they need to be US built, owned and operated.

But after the incident, Exxon started moving away from owning ships – today Sea River does not own or operate any vessels at all, with vessels owned and operated by Crowley on Exxon's behalf.

It is not difficult today to connect a vessel with its owner, however it is named. "33 years ago, you could be a bit more opaque," Mr Ion said.

The following years

After the disaster, "the media focus on clean-up and damage caused by the spill went on for several months."

"Insurance liability claims, arguments over who should pay and when, went on for years afterwards. The final hearings and pay out were not completed until 1996."

The incident "changed the public's perception, and that of regulators and politicians, towards the fossil fuel industry," Mr Ion said. "The idea that 'indiscriminate use of fossil fuels is not a good idea for preservation of the planet' was probably forged in the public's mind around this time."

"I would argue that the Valdez was one of the catalysts which sparked a change in thinking about the fossil fuel industry at a very profound level."

"The other fallout was the advent of double hull tankers, a profound change in the tanker sector."

Electronic charts

Having an electronic chart system would have made it much clearer to the navigators that the vessel was not where they thought it was.

"Back in 1989, I was a navigator, navigating elusively on paper," Mr O'Brien said. "We did have satellite navigation, but using a system called Magnavox, which got a satellite fix every hour, or hour and a half."

"Today, if we marry electronic charts with GPS we have continual position fixing, much more accurately than back in 1989."

Although one master mariner in the webinar audience added a comment that it is still possible to miss navigation hazards on an ECDIS, if the settings are set wrongly, such as the scale. In this sense "paper charts are more idiot proof," he said.

VIEW THE WEBINAR ONLINE

A video recording of the webinar can be found at the following page: <https://navigateresponse.com/exxon-valdez-thirty-three-years-on-a-navigate-response-webinar/>

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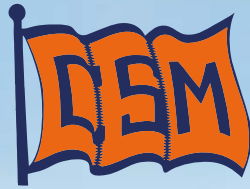

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Port calls – S5 promotes a digitalised approach

Ever since shipping existed, port calls have happened at their own speed. S5 Agency World is promoting a different approach, supported by plenty of digital technology

No-one is particularly surprised if a port call takes longer than expected, or a vessel is kept waiting for a berth. Many different activities take place during a port call which are only loosely co-ordinated. It is understood in shipping that sometimes it all goes well, sometimes it doesn't.

S5 Agency World, an international port agency, believes that it should be possible for port calls to take place almost as predictably as a factory manufacturing process, if digital technology is used in a good way to keep everybody co-ordinated.

Predictable port calls should also mean shorter port calls, which saves everybody money. It also means that processes are being followed, which should mean fewer problems, and better understanding of the potential problem areas.

And it can be the role of a ship agent to help parties plan an achievable schedule, and deliver to it, S5 believes.

This is a change from the traditional role of the ship agent, as a representative of the ship owner in a port, and someone who had personal relationships with both the people who work in the port and with the shipowner. The traditional ship agent could get things done, but not necessarily according to the schedule.

S5 is headquartered in London and claims to be "the fastest growing international port agency in the world." It handles 85,000 port calls a year.

Better IT

Marinus ter Laak, CEO of S5, is a former senior vice president for analytics and technology at SAP, a leading software company for managing business operations which grew out of the manufacturing industry.

On joining the maritime sector in 2020, Mr ter Laak says he was surprised how much the maritime industry worked around relationships, intuition, spreadsheets and in-house developed software, rather than advanced software.

Many shipping companies still have fairly significant IT budgets, "but lots of it is being spent on keeping the current systems up and running," he said.

Perhaps shipping companies ought to go out of their way to "hire IT savvy people," he suggests. "By hiring people used to IT [you] can make a huge difference in catching up [with other industry sectors]."

The question today is how much better port calls could be, with the help of digital technology. "I think we can go much further," Mr ter Laak says. In comparison with manufacturing, "it is not a mechanical process - but it is a process."

This does not mean that nothing can be allowed to go wrong, but things which do not go to plan can also be managed, in an 'exception management' process, he says.

For example, you can have a process to follow if a ship arrives early or late, or if there is a problem with the cargo or a crew change, so that the overall efficiency is maintained as far as possible.

Having better data should also mean better decision making in general, with less reliance on intuition.

S5's technology

Mr ter Laak has driven efforts to develop S5's digital technology offering.

S5's systems are designed to be as easy as possible to integrate with the software systems of port providers and shipping companies, so it can gather information from other systems. Using this information, the charterer, shipping company and port agent can plan tasks better.

The software platform can be used by charterers and shipowners to manage their cargo port calls, including data analytics to predict how long port tasks will take, based on historical congestion data.

The data can be analysed to understand common causes of delay in different ports around the world and their reasons – and so what might help reduce the likelihood of a delay.

There are tools for shipowners to compare port service providers such as surveyors, compare their own port call times with the average of the industry, or compare one port with another.

Perhaps it is possible to find ways to do a survey 20 minutes faster, which can do a lot if it means the whole port call can be 20 minutes shorter. Or perhaps an analysis can identify that a task can be done with one launch boat rather than two.

As well as shipping companies managing data about their own port calls, S5 is able to analyse data for all port calls it handles. It can provide the output to its clients in anonymised form, so for example they can compare themselves to



Marinus ter Laak, CEO of S5

the industry average, or find out what the most likely causes of delay in a port might be. They can find out general information about delays in port, or with other owner's

items such as issues with crew changes from certain nationalities, or with bunker suppliers.

"Internally it provides visibility allows us to manage all of our port offices is worldwide," says Jason Berman, chief commercial officer with S5. "The client can see what's going on with their ships [such as] cargo, port times and disbursement accounts and invoices. It makes it very transparent."

In the tanker sector, ship agents are often appointed by charterers. One parcel tanker company may call the same port 10 times, but be carrying cargoes for 10 different charterers, and so need to work with 10 different agents in the port.

In this case, S5 can offer its 'hubbing' service, which allows a shipping company to work with one hub agent who helps manage and co-ordinate with multiple charterers, and also compare them.

Using it

When they see what is possible, shipping companies are setting themselves goals to improve performance, Mr ter Laak says.

"I came back from a review meeting with a client, sitting down and [looking at] how we can continue to challenge each other to do things better, using the data."

"We came up with new ideas, ways to improve the process. Not only in terms of getting paperwork off the desk, also in terms of how we optimise the vessels and time in port."

Often shipping companies want to set strategic goals, such as to focus on improving performance in 3 specific ports in one quarter, or improving 3 specific elements of a port call. Or they might focus on an area of improvement, such as reducing manual re-keying of data.

Making it easy to manage your valves

Valve distributor W&O Supply offers a free digitalised service to customers, making an inventory of your tanker valves, assessing their condition, and tagging them – it should all make them easier to manage

The valves on a tanker are perhaps part of the ship you don't think about too much – but they can cause an expensive headache when they go wrong, particularly if you don't know enough about the details to order a new one.

To make it easier, valve distributor W&O has developed a new digital service for its clients, where it makes an inventory of your valves, assesses their condition, provides you with a free software tool for accessing data sheets, and helps you plan valve replacements to be made at the next dry dock.

For tanker vessels, the service is mainly for cargo valves and safety valves. Cargo valves are for controlling the flow of cargo onto and off the vessel; safety valves automatically open when pressure in a tank is too high or low for safety, to avoid the risk of rupture of the steel.

Valves are relatively inexpensive compared to other equipment on the ship, but the cost of not having the valves you need is high, says Kristof Adam, European General Manager at W&O.

The best time to replace valves is usually during a scheduled dry dock, so the best time to inspect valve condition and plan for which valves to replace is a few months beforehand, he says.

Many valves can only be replaced during a dry dock or at a shipyard because there are growing restrictions on what work can be done in a terminal.

With many different valves in use, managing valves can get enormously complex. A company with 100 vessels in its fleet may have 30,000 different valve models in use, he says. "Nobody knows what to buy, we see that daily."

Shipping companies are starting to notice how much money they have spent on urgent valve deliveries to a dry dock. "A valve becomes very expensive if you have to fly it around the world," he says.



Kristof Adam, European General Manager at W&O

Inventory and assessment

The service starts with W&O personnel doing a ship check of valves on the vessel, documenting what type of valve it is, and assessing its condition. The review is typically done 9 months before dry dock.

This means that if a valve is due to be replaced in the dry dock, you know what type of valve it is, so they can order the right replacement well in advance.

If the company already has a valve database, then it can be checked and updated to ensure accuracy and consistency.

The physical assessment of the valve can include identifying if it has a complete seal when closed – by closing the valve and seeing if anything passes through, like with a leaking tap.

The assessor can also look at the actuation system. Many valves are opened and closed remotely by pumping hydraulic fluid through them. Sometimes the hydraulic systems can leak.

The assessment can include gathering data of how many times the valve has been actuated (opened or closed) from the ship control system, an indication of whether it may need replacing.

For pressure release valves, you can assess whether the valve does indeed open at certain pressure levels.

There is also a "visible outside inspection", seeing how it looks.

The assessment can include identifying the most critical valves on the ship.

Information which is gathered or checked includes the valve location, purpose, model number, manufacturer / brand, bolt diameter, dimensions, materials, pressure setting, actuator if there is one, testing certificates and expiration dates, shipping and installation dates, inspection and maintenance history, photos of the valve, and data from the valve manual.

The valves are given a RFID (radio frequency identification) tag, so that it can be identified with a handheld device, rather than someone having to get close to the valve to read a number printed on it. The tag also has a barcode and a number printed on it in case the RFID reader is not available.

The data is available online. W&O provides customers with a "valve data management portal." By checking the data on the RFID tag,



Inside the W&O warehouse

vessel operators can also easily tell if it might need to be replaced.

This data can be made available to class inspectors, so they can see all the valves which have been inspected, and all the information about them.

W&O service

W&O is itself a distributor of valves (not a manufacturer), and carries 60m items in stock, including in Houston, Rotterdam and Singapore, with the same valve models available in all stock locations.

Tanker companies typically secure supply chain agreements with W&O for two years or more, where it will provide replacement valves as needed during the period. The valve inventory and assessment service is offered free as an incentive to these customers. Supply agreements ensures owners and operators receive joined up support for the supply of valves, pipes and fittings for their vessels anywhere in the world and allow owners and operators to call on the expertise of W&O's team 24/7.

The service has been in testing with major customers for 2 years. Over 40 different shipowners now have valves tagged by W&O. This includes tankers, general cargo vessel operators, cruise and container operators.

Understanding chemical tanker cargo contamination

On chemical tankers, if a tank and related equipment is not properly cleaned, cargo residues can contaminate the next cargo. Water in the tank can also be a problem. This is leading to expensive claims. A panel of experts shared ideas on how to reduce the risk

Contamination occurs when a cargo is able to mix with residue of the previous cargo carried in the tank, or with water.

Over the past 5 years, there have been 47 insurance claims relating to cargo, totalling \$19.9m, said Captain Shajed Khan, Loss Prevention Manager, Britannia P&I.

17 of these cases related to contamination, amounting to \$4.6m. Water was a common issue.

He was speaking at a webinar on March 31, 2022, organised by Britannia P&I Club, looking at the most common contamination issues with chemical tankers, and practical ways to reduce them.

The basic cause of a contamination claim is when cargo is in a different condition on discharge than it was on loading, he said. For example, because the tanks weren't cleaned thoroughly enough, and so residue of the previous cargo mixes with the current one.

One of the most important decisions is whether or not you will accept a cargo at all, Captain Khan said.

In one case, a shipowner had to spend 2.5 months preparing tanks for a cargo. In this case, there may have been miscommunication between commercial and technical departments, when the decision was being made about whether to accept the next cargo.

When considering whether to accept a cargo, you need to know about the ship coating and how it relates to different cargoes.

You need to know about the condition of the tanks. You cannot take the "Certificate of Fitness" as a suitable guide to the suitability of a tank, because the certificate could have been issued when the ship was delivered or just after its renewal survey, he said, and corrosion could have occurred since then.

There can be problems from corroded tank material mixing with the cargo.

You need to consider the amount of tank cleaning required to prepare for the next cargo, and if there is enough cleaning chemical and fresh water available on the ship. Also, if there

is equipment on the ship to test tanks after cleaning, such as for a wall wash test.

Another important process in minimising claims is cargo sampling. Samples taken before loading cargo, and after cargo discharge, can prove that any contamination was not caused by the ship. If you take a sample from the manifold (of cargo before it is loaded on the ship) you can prove that any problem was caused on shore, he said.

Samples need to be taken by the crew, rather than relying on the cargo owners to do it, he said.

"The chief officer or representative should be following the surveyor making sure samples are taken appropriately. Record any protest."

In sampling, the equipment needs to be clean, and there needs to be records of how the samples have been handled after being taken. "I saw some cases where the cargo is good, but the [sampling] equipment was not clean enough."

For the voyage, there should be clear instructions to crew about all tasks necessary for avoiding contamination, such as checking cargo temperature for any sign of reaction with water.

MEG

Arnold Ridley, Partner and Solicitor with RR&CO, a specialist maritime law practise based in London and Singapore, described the challenges with four particularly sensitive, but commonly carried, chemicals. MEG, methanol, palm oil and styrene monomer.

Starting with MEG (Mono ethylene glycol), there are 3 main grades: fibre, industrial/technical and anti-freeze, he said.

"Fibre" grade MEG has the highest standards, and its quality is tested by passing UV light through it at different wavelengths. There are extremely low permitted amounts of iron, chlorides and water.

The tanks must be cleaned to high purity standard. This can be tested with a wall wash test, which involves someone physically entering the tank. They spray a chemical on the walls of the tank, usually methanol, and then collect some of the liquid after it has washed down the

wall of the tank into a bottle. This liquid is then tested.

A sample is typically taken of two different locations on the tank wall. Sometimes testers try out awkward-to-reach parts of the tank, with a sample collection equipment on a telescopic pole, "to try to make it fail," he said.

There have been some efforts to reduce inspections carried out inside tanks for safety reasons.

If cargo is present on a tank wall in a parts per million level, when the new cargo is added, it will be much further diluted, to a parts per billion level.

Stainless steel is "excellent" for high purity MEG. Coated tanks are "not so effective," he said. Some coating systems can absorb aromatic chemicals such as benzene and xylene, and then release them in a future voyage.

"Antifreeze" grade MEG has a lower purity standard, he said.

If MEG is able to react with oxygen, it can start degrading, then fail the UV transmittance test. So, tanks are purged with nitrogen rather than have air sitting above the cargo in the tank.

MEG is also "hydropscopic", which means it attracts water molecules. So, it is important to check that cargo is dry (free of water) and clean before it is loaded, and then remove any pathway for water to reach it.

Palm oils

"Crude" palm oil is fresh from the fruit of palm trees. It goes through a refining process to remove a substance called "free fatty acid" (FFA). This has an unpleasant taste and smell. Crude palm oil can have 5 per cent FFA, refined palm oil has max 0.1 per cent. Palm oils come in up to 15 different grades altogether.

Any water in the palm oil will cause more FFA to form. A rule of thumb is that for every 1 per cent increase in FFA, the sale price of the cargo decreases by 1.5 per cent, he said.

Also, the longer the cargo is being carried, the more FFA will form. If there is a delay to the voyage, such as from engine breakdown, or

problems with documentation at the discharge port, it increases the length of the voyage.

Since the cargo is “edible grade”, there cannot be any previous cargo residue, which means a high cleaning standard.

It is important to keep in communication with the terminal, so both the ship and the terminal have the same figures about how much has been loaded, and what the acceptable pressures are, he said.

Methanol

Methanol is one of the top four chemicals used worldwide.

Any previous cargo can cause problems with methanol. Mr Ridley recommended particular care be taken if the previous cargo was inorganic and organic acids, aldehydes, organic caustics, sodium chlorides, and monomers.

“Animal fats and vegetable oils can dissolve into methanol and knock off all the parameters – colour, appearance, odour,” he said. This can’t be removed by refining the cargo at discharge ports.

There are ways to rectify cargoes which are contaminated for other reasons. If there is a small amount of water contamination, the cargo can be blended with an ‘on spec’ cargo, so both cargoes now contain water but at a lower level.

There may be opportunities to sell the cargo at a reduced “salvage price”. Also in Houston, Antwerp and Korea, there are facilities to re-distil the cargo, he said.

Styrene monomer

Styrene monomer is a building block for plastic. It is ‘fundamentally unstable’. An inhibitor is added which stops it from turning into a polymer (plastic) while it is a cargo.

The inhibitor is only effective for a certain period, so you need to know exactly when it was added to know how long it is effective for.

If the inhibitor stops working and the cargo starts polymerising, one indication will be a rise in temperature, because this is an exothermic reaction. If the temperature rise is more than 1 degree per day over 5 days, you may have a ‘runaway reaction’. This could lead to a tank rupture or explosion.

You can take samples of cargo and test for the level of inhibitor. Although more inhibitor will decrease the value of the cargo.

If adding more inhibitor does not work, you can quench the cargo with a solvent, but then the value of the cargo goes to zero. But if this is not done, it can take 6-8 months of water blasting to remove the (now) plastic from your tanks, he said. If the original receivers won’t accept the cargo, you need to find another way to discharge it quickly.

Mr Ridley recommends taking samples every day to check polymer content. A number of samples can show a pattern of contamination and



Screenshot from Britannia P&I Club's webinar about cargo contamination claims. Captain Shajed Khan, Loss Prevention Manager, Britannia P&I; Christine Arnold Ridley, Partner and Solicitor with RR&CO; Christine Vella, Fleet Manager, Britannia P&I.

help identify the cause.

Insurance claims and regulation

Most contamination insurance claims come from the cargo receiver or their insurer, under the “Hague-Visby Rules”, said Christine Vella, Fleet Manager, Britannia P&I.

These are a set of international rules for the international carriage of goods by sea. They are an updated version of the “Hague” rules, drafted in Brussels in 1924.

Alternatively, claims can be brought by the charterer, under the terms of the charterparty.

If a tanker operator is presented with a claim, the first step is to work out how the claim is being made – who is making the claim and under which contract and term.

The shipping company is normally responsible for carriage from “manifold to manifold”, or from loading on the ship to discharge from the ship. But it can vary, sometimes the tanker operator is also responsible for care of goods before loading, she said.

A first legal challenge is that the receiver may bring a claim in their local jurisdiction. The rules vary around the world, for example the Chinese Maritime Code 1992 incorporates only parts of the Hague-Visby rules.

The claim against a tanker operator would say that the cargo was loaded in ‘x’ condition and discharged in ‘y’ condition, she said. To defend itself, the tanker operator needs to be able to show that the cargo was loaded and discharged in the same condition, and any contamination occurred before or after shipping.

In a UK Supreme Court ruling of 2018 known as the “Volcafe Case”, it was clarified that (under UK law) the burden of proof is on carriers to prove that they took “all reasonable and proper care” of the cargo.

If there are any claims, the shipowner should consider if there are any mitigation steps, such as blending or treating cargoes to bring them to within the specification, she said.

Records and regulation

For cargo samples to be useful in defending claims, it is important that they come with records of the ship’s name, product name, sample source (tank / manifold number), sample type (where in the tank it was taken from),

identify of surveyor or crew member that took it, date and time, and location of the vessel, such as at port or anchorage. If the sample is sealed, record the seal number, she said.

She suggested that tanker operators insert a clause in the charter party to say that any time a surveyor working for the charterer takes a sample, another sample is taken at the same time and provided to the shipowner.

Also, if the crew take samples, they are advised to keep documentation of when they took them and what happened to the sample, which can include photos of them taking the samples. If samples are given to a surveyor, there should be a ‘custody handover form’ keeping records.

It may be necessary for the samples to be tested at a ‘independent laboratory’ for the analysis to be trusted by both sides.

If a claim ends up in court, under English law parties may be required to disclose all relevant information, even if it does not serve their interests, she said. The only exception is if the document is created at a point where a “litigation privilege” defence can be exercised, which means that the litigation had already started, or you knew it was very likely to start.

So, you can expect to have to reveal all documents in standard company databases and safety management systems. Also, if an owner calls in an expert to review a problem, that report would need to be disclosed. But if you get to the stage where a receiver has raised an issue, and the tanker operator brings in its own surveyor to review it, that report could be counted as ‘privileged’ (not something you need to disclose), “because it was obtained when there was a likelihood that the dispute will go and progress -to courts.”

The most complex part of claims can be establishing the facts, particularly when there is a lack of evidence about the condition of the cargo at different stages, she said.

Links to the video and presentation are online here

<https://britanniapandi.com/2022/03/britannia-loss-prevention-webinar-contamination-claims-on-chemical-tankers/>

Resolving ballast water problems

There have been increased reports of problems with ballast water systems. They are mainly caused by the system around the treatment, not the treatment itself, says Filtersafe's Mark Riggio

Many tanker operators have seen problems with their ballast water system. Despite being certified and fully checked after installation, something goes wrong in actual operation.

Experience shows that problems are often caused by something other than the actual ballast treatment system itself, says Mark Riggio, head of marine with Filtersafe. Problems can be caused by installation errors which do not reveal themselves until the ship is trading. Or caused by how the system is being operated.

But identifying and fixing a problem can take specialist skill, which can be beyond the capacity of crew, he says.

Ballast water systems are basically water treatment systems, and the amount of treatment needed can actually be higher than the treatment given to drinking water in many cities.

The problem can be compounded by shipping companies seeking the cheapest system which will comply with the regulations, he says.

Or to say the opposite, if shipping companies want a system with automation capable of handling the full complexity of operations, these will not be the cheapest.

Shipowners often say that they want a system they can use anywhere in the world, with no restrictions on flowrate. But such a system will not be the cheapest, he says, in the same way that if you want a lorry which can move any size load, it won't be a small pickup truck.

If you buy a cheaper system, you may find the purchase savings offset by increases to your operating cost, such as from delays to the vessel loading due to slow ballast water treatment capacity.

Loading rate

Another commonly reported problem is when a ballast water system is unable to treat water at the required rate, loading ballast at the same rate that cargo is being discharged from the vessel, in order to keep it stable.

When people say they think they have a problem with their ballast water system, it normally turns out to be a low flow rate they are complaining about, Mr Riggio says.

You may have a pump which can handle 800m³ an hour of water, but it is actually

pumping 400m³ an hour.

It may not actually be a fault, but the system working as designed, measuring the sediment level in water and calculating that it will only achieve the desired 'kill level' at a slower flow rate, Mr Riggio says.

It can be tempting to think that the cause of the low flow rate is a filter, and if they could remove the filter then it would be solved.

But typically, the only vessels which don't need filters are large tankers trading from single point moorings at sea, and not ballasting river water, Mr Riggio says. And it is river water which needs most ballast water treatment, because it contains more organisms.

"If the filter is getting in your way it's because it is working, it is removing the organisms," he says.

Understanding problems

Ballast water systems typically have sensors measuring and recording over 25 parameters continuously. There can be multiple parameters recorded on one sensor. People with the right combination of skill sets can get insights into system operations from this data.

Doing this requires the ability to work with large data files, pull them into a usable format, and to analyse the data. It can take some determination to work with the data to see what it might be showing, or make visualisations. This is probably not a task crew can do themselves.

If the operating manuals are badly written, or tasks have been executed in the wrong order, this can create additional problems.

Seafarers are often very good at finding their own solutions to problems or making workarounds. But this may not be helpful in keeping the ballast water system running.

To illustrate, one hazard with ultraviolet-based ballast water systems is that if the lamp is on but there is no water flowing in front of the lamp, there can be an explosion risk, Mr Riggio says.

This means that a shutdown of the system needs to be handled in the right order, cooling down the lamp before switching off the pump which pumps water across the lamp.

Ideally this would be handled with an automation system, so the crew would only need



Mark Riggio, head of marine with Filtersafe

to press one button "stop ballasting" and the automation would switch everything off in the right order.

But cheaper systems do not have this, and rely on crew following a shutdown procedure.

Some companies have set up an electronic system which automatically switches off the lamp when the pump is switched off. But this is something crew might want to 'work around' if they did not understand why it was happening.

"Seafarers are highly trained and very competent individuals. The problem is the breadth of competencies that they require is so staggering it is almost impractical to expect someone to do all those things," he says.

"There's too much that they have to deal with and be responsible for, especially during critical times."

Ultimately, using ballast water systems should be easier than not using them, Mr Riggio says.

While most people want to comply with the regulations, "if you make compliance harder than noncompliance, you can't blame people for choosing to not comply," he says.

"I spent a lot of time and effort thinking about how I can help people to comply, how I can help make these systems easier to use than to bypass. Or how to make it easier to use them properly. Rather than try and negotiate your way through partial compliance, or deal with something not operating the way it's supposed to."

TO

Regulatory changes and deadlines

Stelios Kyriacou, chief technology officer of BWTS supplier ERMA FIRST, shares perspectives on BWTS regulatory changes, operations and maintenance, handling the aft peak tank, and the impending installation deadline

By Stelios Kyriacou, Chief Technology Officer, ERMA FIRST

Currently, if you install a type-approved ballast water treatment system (BWTS) that will work onboard your vessel, and it is operated correctly by your crew, you will comply with the rules.

But there are new IMO requirements for commissioning testing [testing a new system once installed], entering into force on June 1 2022.

Under these rules, compliance isn't only measured in a shipowner's theoretical compliance to the rules, but the practical treatment of water onboard their vessel.

Given the high commissioning testing standards set by the IMO, and the sector's experience of commissioning issues caused by installation issues so far, this is making it even more important that shipowners work with expert suppliers to ensure that systems are installed exactly as intended.



Stelios Kyriacou, Chief Technology Officer, ERMA FIRST

There are evolving US policies on compliance testing. The picture for compliance testing seems less clear. The pandemic appears to have slowed the pace of regulatory development in this area, and the lack of resolution on standardised sampling protocols for IMO Port States represents a real risk.

Even where USCG testing policies are more developed, there are real questions about the viability of proposed testing methods and grey areas that could develop.

Operations and maintenance

One of the notable take-aways from IMO's "experience-building phase" of ballast water regulations is that a system that is too difficult for a crew to use will simply not deliver compliance in operation.

This highlights that user training is still not adequately addressed. Ship operators and managers must prioritise such training to avoid poor system operational availability and regulatory non-compliance.

Complicated operational routines can lead to mistakes. These mistakes could prevent a system from working properly, or inadvertently result in damage that translates to additional costs for a ship operator. Or they could do both.

This is only going to get more important as more jurisdictions start putting in place serious compliance checks, such as operational assessments or water testing.

The aft peak tank

For tanker owners, there is an added

complication. Aft peak ballast water tanks require the same level of treatment as other tanks, yet are separated from primary systems and BWTS.

Shipowners can simplify their procurement and integration requirements by ordering simple systems with small footprints.

At ERMA FIRST, our oneTANK system is able to act as a standalone system with a minimal physical and energy footprint. The system's simple in-tank treatment offers a flexible yet effective means to address the aftpeak tank treatment requirements.

The system has a footprint of only 60 square centimetres, or two square feet, and can be integrated into a vessel using only a ship's existing infrastructure. No need for 3D laser scans and extensive engineering studies.

Deadline

The impending deadline for system implementation is already creating a peak in demand, creating a challenge for many suppliers' ability to deliver a system to a tight schedule. This means that shipowners now need to plan even further ahead when organising installations.

It means that a shipowner has little room for error – and must be sure that the partners they have chosen can deliver a high-quality service on schedule, and that the ballast water management system they have chosen fits their requirements.

"Where this is understandably putting a temporary strain on the order book, at ERMA FIRST, we have extra capacity across our entire range."

TO

Should regulations change for challenging water?

If a shipping company has to load ballast water in a port with 'challenging water' – ie with sediment levels too high for its UV ballast water system to work – should it get an exemption from the regulations?

Ships are running into problems when they need to load ballast water which has a high level of sediment, and

subsequently their ballast water treatment system can't achieve the required organism 'kill level'.

The problems happen then their ballast water system relies on ultraviolet light to kill organisms, and the sediment prevents the

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BALLAST

light from having enough 'kill power'.

Many ports around the world are in rivers, including in Hamburg, Rotterdam and Shanghai. These rivers carry sediment, the level of which varies during the year.

The power of a ballast treatment system can also be compromised by the temperature and salinity of the water.

If a vessel is fixed to discharge cargo (and ballast) at a port it does not usually visit, and the sediment levels are particularly high, it is arguably not the direct fault of the shipowner if the ballast water cannot be properly treated, or if ballast water can only be loaded at a fraction of the normal rate, to give the organism killing process more time to work.

There were hopes in the industry that IMO's Marine Environment Protection Committee (MEPC) 77th meeting in November 2021 would formalise some exemption – but this did not happen, says Mark Riggio, head of marine with ballast water filter supplier Filtersafe.

There were discussions at the meeting reinforcing the point that no port in the world would ever have a blanket exemption from ballast water rules.

If vessels are on a regular (liner) service between the same ports, then they are expected to make sure that their ballast water systems are able to handle the water at these ports at any time of year, he said.

Shipping companies will need to negotiate with local regulators on a case by case basis if they are unable to treat ballast water to the required level. "When you show up and there's a problem, you're going to have to deal with that with the port state," he says.

Shipping companies are in a grey area "where they have to talk over every circumstance to every port state, and see what contingency measures they accept, or where they have to discharge the [not fully treated] ballast."

There may be more discussions about the issue at the next meetings, MEPC78 (June 2022) and MEPC79 (Dec 2022), Mr Riggio says.

One possibility is that future regulation may give shipping companies an opportunity to fix a problem. So if they visit a port and find their system cannot handle the ballast water, they get a one-off exemption, but they need to fix it before their next call at that port, he says.

Or there may be allowances if a port has particularly bad water quality, because there has been a big rainstorm and a great deal of sediment coming down the river. But the ship will not get the exemption every time it calls at that port.

On a separate issue, there have been IMO discussions about developing better ways to test whether or not a system is working properly, including discussions at IMO's PPR9 (Sub-Committee on Pollution Prevention and Response) meeting in April 2022. It may encourage the use of handheld tools which could be used for some elements of testing onboard.




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Ecochlor – getting the right system is crucial

Some shipping companies have installed BWMS which turned out not to be fit for purpose, says Ecochlor. And there may be a need for ‘contingency’ allowances in national regulations for when water has ‘challenging’ quality, such as particularly high sediment levels

By Andrew Marshall, CEO, Ecochlor

More than 20 years ago, Ecochlor had a mantra when speaking to shipowners that was repeated again and again. “You need to look at the system design limitations (SDL) as well as the ship’s operational requirements and trade routes before choosing a ballast water management system (BWMS) for your vessel.”

In other words, choose carefully so that you get the right system, on the right vessel, that gives you optimal performance of the BWMS in the waters of your ship’s trade routes.

Unfortunately, many early-adopters weren’t listening and instead focused their standards on finding the lowest-priced BWMS.

As regulatory requirements became more rigorous, owners started looking at the BWMS with IMO and USCG Type Approvals, figuring that if these systems had passed the rigorous testing requirements for certification, then surely that would mean it would be complying when used on their ship.

Again, we repeated our mantra.

Some owners did start doing feasibility studies and picked their BWMS based on the system design and/or limitations for their specific ship or fleet as well as trade routes.

Some did not, and after their ship’s crew spent considerable time trying to make the system work in waters that weren’t compatible or extremely challenging, they threw up their hands in defeat.

Now, those same owners are back in the market, looking for another BWMS that is a better fit for their vessel.

The financial loss of taking a BWMS off the ship and installing another one is considerable. But the long-term cost of non-compliance is more – including costs to the reputation of the owner or ship management company.

For the most part, if the BWMS system is not in synch with the vessel’s operations, the only option is a second installation with a new BWMS.

I recommend that shipowners take a hard look at treatment systems prior to BWMS selection, to make sure that it is going to do everything that you require, and that it is simple for the crew to operate.

Training

The depth of training that is provided to the crew is an often-overlooked point in running the BWMS efficiently and minimizing non-compliance.

Manufacturers and shipowners should be engaged to ensure every crew member operating the system has sufficient tools available for training. This includes any new crew boarding the ship after the commissioning.

Ecochlor has shipboard classroom and hands-on training programs, which can be held at the owner’s facilities. We provide twice-yearly instruction opportunities to new seafarers and any crew needing a “refresher” course when onboard, for our chemical resupply operation.

Challenging water quality

There has been a lot of buzz around the topic of ports with challenging water quality (PCWQ).

Shipowners have requested better clarity for the legal situation when crews are faced with waters that are particularly challenging for their installed system.

As we near the end of the IMO’s experience-building phase for the Ballast Water Management Convention implementation, there is an expectation of increased penalties by Port State Control when inspecting non-compliant ships.

In early 2021, INTERTANKO asked their membership to send them information on any problems they were having with their ballast water management systems whilst in port.

This was in preparation to support a proposed new IMO Circular that hoped to provide guidance for the application of the BWM Convention to ships operating at PCWQ, using a draft proposed by Liberia, INTERTANKO and INTERCARGO (MEPC 76/4).

They received 468 responses and published the results in March 2022.

After combining the individual reports from their members, they submitted the results to the International Maritime Organization (IMO), Maritime Environmental Protection Committee (MEPC) for discussion at the next meeting (MEPC 78/INF.17).

In the report, INTERTANKO characterized

a total of 192 ports as having challenging water conditions that affected ship’s ballasting operations. Most of the issues seemed to stem from waters having heavy sediment, which were causing problems with filters or affecting the efficacy of UV transmittance.

The summarized member reports are as follows: 72 occurrences where BWMS failed and 66 with operations at reduced rates due to PCWQ; 176 times the BWMS needed to be bypassed due to physical limits and/or failures; 26 times the system was bypassed due to exceeding the system design limitations (SDL); and 17 instances of ships experiencing delays.

The Ballast Water Equipment Manufacturers Association (BEMA) responded to the INTERTANKO report by publishing a “Position Statement”. This focused on presenting technical information and deliberations, also with comments from some flag states and industry stakeholders.

BEMA stated that the “selection of a quality ballast water management system (BWMS) that is suitable for and aligned with a ship’s operational profile and anticipated voyage patterns remains a critical foundational aspect of proper ballast water management.”

“If an inappropriate BWMS is selected, the chances that owners will experience operational challenges increase significantly.”

When a BWMS “is installed, operated and maintained according to the BWMS manufacturers’ specification, operation of a type approved BWMS is expected to result in ballast water discharges that are compliant,” it said.

BEMA supported the need for “appropriate contingency measures that are vessel, BWMS and situation specific,” and these contingency measures should be approved by flag state and part of the ship’s BWM Plan.

However, the Association believes that “revising the existing IMO contingency measures guidance (BWM.2/Circ.62) to reflect common practices and experiences gained during implementation, rather than developing new guidance specific to contingency measures to be used in ports with challenging water quality, may offer a practical and efficient way forward.”

TO

Ballast Water Treatment System (BTWS) news

News from ballast water treatment system suppliers DESMI, Optimarin, De Nora, Techcross and BAWAT

DESMI

DESMI of Denmark has an updated "Ex-certification" for its "CompactClean" ballast water management system.

Up to now, DESMI's systems have been approved for installation in gas zone IIB, which enables installation on roughly 99% of all oil and product tankers, gas and chemical carriers, says Rasmus Folsø, CEO of DESMI.

"However, a few vessels require gas zone IIC, and the CompactClean BWMS is now available also in this version."

"The version contains electrical components certified for IIC. The UV unit is casted in stainless steel instead of bronze in this version."

The company's sales in 2021 were 44m Danish Krona (USD \$6.5m) which is 63 per cent up from the 2020 result after tax, he says.

"Going into 2022 we have the largest orderbook ever, and in the first quarter of 2022 we have continued to see a very strong order intake."

Optimarin

Optimarin of Norway said in March 2022 that it estimated that around 30,000 ships, or half of the 62,000 vessels which need to fit BWTS, had not yet fitted them.

With the final deadline in Sept 2024, just 30 months away, it means about 1000 system installations per month, which will "put a massive squeeze on yard and engineering

capacity," said Leiv Kallestad, chief executive of Optimarin. "But if installations are rushed that could lead to more operational problems or higher maintenance costs."

When selecting a BWTS it is important to consider system reliability, since this will determine your future maintenance requirements, and ultimately, the lifecycle cost, said Tore Andersen, president of sales and marketing with Optimarin. Another factor to consider is a system's ease of upgrade, which will help it to be future proof.

Optimarin has aimed to develop its system to be modular, which makes it easier to adapt for different vessel layouts, including larger ships with tighter space constraints. It can typically be installed in 10-30 days, Mr Andersen said. Optimarin has also aimed to simplify the components and reduce their size.

De Nora

"The runway leading up to the ratification and adoption of the IMO Convention has been so elongated over the years," said Susanna Wyllie, Global Proposals Manager Marine, with De Nora, a BWTS supplier based in Italy.

"De Nora Marine Technologies has properly planned its staffing, from engineering to manufacture and commissioning, to rapidly accommodate the needs of shipowners and operators as they now face compliance deadlines," she said.

"We have the capability and are ready to

support shipowners and operators meet their Ballast Water Management System (BWMS) needs."

"That said, it's crucial owners and operators make decisions now about their investment in ballast water management systems. Time is of the essence and the risk of an industry-wide backlog increases every day, putting vessel operations and vessel revenue at risk."

TECHCROSS

TECHCROSS, a BWMS manufacturer in South Korea, has developed an integrated control platform for managing ballast water treatment, ballast tank level gauging, and ballast valve remote control, which it calls "IBTV".

The tank level gauging system can measure the water level in ballast tanks. The valve remote control system can operate the valves of the ballast water system, and other valves onboard the ship if required.

It has also developed "TECHCROSS Smart Platform", a software tool for working with the IBTV, which stores and analyses ballast water related data. Remote access from shore is possible.

It makes it possible to monitor equipment performance and detect problems early, which may reduce later maintenance costs.

BAWAT

BAWAT of Denmark reports that it has signed an agreement to supply a system to a bitumen carrier operator. The name of the customer was not disclosed. "This shows that the BAWAT ballast water treatment technology suits most vessel segments and types," it said.

BAWAT utilises onboard waste heat to treat ballast water, in a 'pasteurization' process. It involves no filters, chemicals or UV, and only one pass is needed.

As well as offering a shipboard system, it offers a mobile containerised system which could be used by multiple vessels in a port, and provides 'ballast water treatment as a service' in certain ports, as a back-up to vessels who are not able to use their onboard system for any reason.

The company has listed its shares on the Nasdaq exchange, and its first day of trading was March 28, 2022.



Optimarin's ballast water treatment system



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