Thursday 26 September	
0800 – 0900	Registration & Networking Coffee
0900 – 0915	**Opening Address:** Marcie Merksamer, Vice President, *EnviroManagement*, Inc, Symposium Steering Committee
BALLAST WATER: Implementation & Experience Building	
0915 – 0935	**Challenging Water Quality: Experiences & Data** Ballast Water Management systems have been the cornerstone of water compliance through ballasting operations since the inception of the D-2 standard. This standard was developed to ensure any ballast water would not discharge harmful organisms into different environments, thus introducing alien invasive species. There have been reports of these systems however struggling in ports with challenging water quality, this could be in the form of sedimentation, salinity, temperature and Ultraviolet transmittance. This has led to interim guidance being developed for ships operating in in challenging water quality conditions through Resolution MEPC.387(81) which was adopted by MEPC 81 in March 2024. Within this guidance, INTERTANKO referenced the use of its Challenging Water Quality (CWQ) database. Primarily used for voyage planning and as a reference tool, it aids in anticipating and addressing CWQ situations. The tool is also designed for effective communication with receiving port State Administrations under regulation A-4, where unexpected issues arise. Parties to the BWMC could also consider the information from the CWQ database to decide on the information that they would want to share with mariners, the Organization and any potentially affected coastal States of areas under their jurisdictions where CWQ exists, as provided under regulation C-2. The CWQ database, used together with the guidance in Resolution MEPC.387(81), could aid Parties to the BWMC to coordinate efforts of both their port and coastal State Administrations in minimizing differing interpretations and instructions to ships affected by the CWQ. This could enhance the level of compliance to the BWMC while providing ships with clarity on what is expected from them. **Speaker:** William Sturdy, Assistant Manager, **INTERTANKO**
0935 – 0955	**Testing Experiences & The Path Forward** The need for accurate ballast water discharge testing is crucial, as demonstrated by 15 years of experience with type approval, commissioning and compliance testing. Testing against the D-2 standard of the Ballast Water Management Convention (BWMC) is pivotal for the proper implementation of the convention, whether during type approval, commissioning, or compliance monitoring and enforcement.

	In response to the shipping industry's requests, the focus has been on promoting independence, quality, comparability, transparency, and accuracy in ballast water testing. Global TestNet's membership is based on expertise and a commitment to facilitating good and impartial testing. The learnings accumulated by our members over the past two decades will be synthesized, and suggestions on best practices will be proposed. **Speaker:** Guillaume Drillet, *Chair*, ***Global Test Net***
0955 – 1015	**Training for Compliance** With the deadline of September 8, 2024 approaching for the end of the implementation phase of the 2024 Ballast Water Management Convention, the landscape is changing for both vessel owners and port state control when it comes to approaching compliance with the D-2 standard. No longer able to hide behind the guise of the complex transition schedule from the D-1 exchange standard to the D-2 treatment standard, all parties need to become more educated about their roles and responsibilities in complying with the Convention, the details of the many guidelines that have been issued by the IMO on ballast water matters, and the multitude of Unified Interpretations and Circulars that color the enforcement of the Convention. This talk will discuss the multiple different types of training and delivery methods that are available to help ships' crews, port state control, and recognized organizations untangle the web of information about ballast water compliance and help ensure that ships are meeting the requirements of the Convention. **Speaker:** Mark Riggio, *President*, **Simplify Ballast**
1015 – 1030	Panel Discussion: **Speakers:** • Mark Riggio, *President*, **Simplify Ballast** • Guillaume Drillet, *Chair*, **Global TestNet** • William Sturdy, Assistant Manager, **INTERTANKO**
1030 – 1100	Coffee & Networking
Biosecurity Regulations Keeping Pace with Industry	
1100 – 1120	**Biosecurity Lessons from other industries** For decades, various industrial sectors have introduced and implemented relevant biosecurity regulations and technologies to protect global food security, national agricultural interest, and biodiversity from the risks of diseases and invasive species. This presentation will outline a few land-based biosecurity approaches and regulatory frameworks for developing, approving, and verifying practical and effective methodologies and management practices. These experiences on land may benefit the maritime industry in evaluating and addressing its biosecurity challenges such as international food waste, ballast water, and hull biofouling. **Speaker:** Dr Wei Chen, *Consultant*, **EN Decision Ltd**
1120 – 1140	**Manufacturers' & Suppliers Supporting Global Biosecurity Implementation** The Ballastwater & Environmental Manufacturers' Association (BEMA) is a not-for-profit organization dedicated to providing manufacturers and service providers in the ballast water and biofouling equipment markets with leadership and a unified voice. The Association works on behalf of its members to provide technical information to relevant stakeholders about effective treatment of ballast water and biofouling technology designed to prevent the

	transfer of aquatic invasive species by ships. BEMA contributes technical information and real-world experience to support the work and strategic goals of the International Maritime Organization (IMO), and serves as a central point for regulatory agencies, the testing community, and the general public seeking information about biosecurity management equipment. With ongoing implementation of the IMO's Ballast Water Management Convention, equipment manufacturers and ship owners have gained significant ballast water management system (BWMS) operational experience. As the international community works to update current ballast water regulations and develop new regulations for biofouling management, BEMA's technical input is critical for the IMO, the International Organization for Standardization (ISO) and other authorities to support effective regulation based on available technology. The experience BEMA Members have gained through the 20-year journey of implementing ballast water management regulations, makes BEMA well-suited to support these efforts. The goal of this presentation is to share BEMA's current work to highlight areas where our Members see opportunities for regulatory framework revisions to support technology innovation for improving environmental sustainability of ships, and to support development of technically informed biosecurity regulations. Speaker: Birgir Nilsen, *President*, **Ballastwater & Environmental Manufacturers' Association (BEMA)**
1140 – 1200	Panel Discussion: Speakers • Dr Wei Chen, *Consultant*, **EN Decision Ltd** • Birgir Nilsen, *President*, **Ballastwater & Environmental Manufacturers' Association (BEMA)**
1200 – 1345	Lunch (provided) Hosted by Subsea Global Solutions
BIOFOULING MANAGEMENT: Focus: Regulation or Business Edge	
1345 – 1405	**Shipowners Perspective: Challenges & Good Practices** 2023 IMO BioFouling Management guidelines provide structured procedures for the prevention of the transfer of Invasive aquatic species from ship's hull, in addition different local regulations are in place (Australian, New Zealand) or being discussed (Norway). Shipowners face different challenges in complying with these different regulatory requirements: local inspections, record of cleaning, where to clean, how, effect on coating, cost, Biosecurity versus GHG reduction etc.. The balance among regulatory, environmental and market drivers is not an easy one to reach, and inappropriate interpretation of the guidelines or good practices selection may lead to undesired consequences; it can create additional fuel cost and GHG emissions increase. To avoid that, shipowners apply different methods/strategies to reduce Fuel Consumption (hence GHG emissions Energy Efficiency improvement) through good practices related to Biofouling Management. The present paper will review the practical implementation of the biofouling management guidelines 2023 and some of the strategies that shipowners are adopting to minimize biofouling impact on their fleets; it will also present the interactions among Biofouling and CII. **Speakers:** Dr Jose Gonzales Celis**,** *Senior Director, Sustainability***, CLIA, Europe**

	Francesco Sandrelli, *Policy Director – Environment*, **UK Chamber of Shipping**
1405– 1425	**Biofouling Investigation for Arbitration Purposes** Biofouling is a major concern for commercial fleets and the shipping industry. The build-up of marine life, such as barnacles and mussels, on the hull of vessels increases drag on the vessel. This increased drag can reduce ship speed by as much as 86%, thus increasing travel time, or decrease engine performance with a considerable increase in associated fuel costs and emissions. It is therefore a serious economic and environmental problem. Hull fouling claims typically involve an interesting interplay between technical/practical and legal aspects. In my presentation, I will delve into the technical evidence which I consider when formulating an opinion on real-world hull fouling dispute cases. **Speaker**: Dr Marcelo Rodrigues, *Senior Scientist*, **Brookes Bell**
1425 – 1445	Panel Discussion: Speakers • Dr Jose Gonzales Celis**,** *Senior Director, Sustainability***, CLIA, Europe** • Francesco Sandrelli, *Policy Director – Environment*, **UK Chamber of Shipping** • Dr Marcelo Rodrigues, *Senior Scientist*, **Brookes Bell**
1445 – 1515	Coffee & Networking
Regulatory Development & Technology	
1515 – 1540	**Upcoming ISO Standards on In-Water Cleaning** In-Water Cleaning (IWC) is a low-hanging fruit for any ship owner aiming to become more sustainable, and should be an obvious part of any ship's routine activities. However, very few conduct IWC on a regular basis. The main reasons for the lack of IWC are not a lack of technological development within IWC, or a lack of IWC service providers. Rather, the main reasons are arguably a lack of knowledge as well as a lack of comprehensive biofouling management policies. An ISO standard under development aims to address these challenges. ISO 6319 describes the IWC process, including all relevant aspects such as preparations, the assessment of the hull prior to the IWC operation, the cleaning operation itself and post-cleaning processes. The standard will provide knowledge about how IWC may be conducted in a safe and environmentally sound way. Since ISO 6319 provides methods for the documentation of the IWC operation, it will assist ports and local authorities in regulating IWC, and help to assure shipowners that cleaning services are performed according to a specific standard regardless of location. ISO 6319 aims to provide a level playing field for a range of stakeholders including ports, IWC service providers, coating manufacturers and shipowners. ISO 6319 aligns with, and supplements, the 2023 IMO Biofouling Guidelines, and the ISO is also a member of the correspondence group currently developing the "Guidance on matters relating to in-water cleaning" at the IMO. **Speaker**: Irene Øvstebø Tvedten, *Senior Advisor Maritime*, **The Bellona Foundation**
1540 – 1605	GloFouling Project Update – ABSTRACT PENDING **Speaker**: Lilia Khodjet El Khil, GloFouling Project Technical Manager, **GEF-UNDP-IMO GloFouling Partnerships**
1605 – 1625	Panel Discussion:

	Speakers: • Irene Øvstebø Tvedten, *Senior Advisor Maritime*, **The Bellona Foundation** • Lilia Khodjet El Khil, GloFouling Project Technical Manager, **GEF-UNDP-IMO GloFouling Partnerships**
1625 – 1645	Chair's Day 1 Summary
1645 – 1800	Drinks Reception - Hosted by **BioMarine Services**
Friday 27 September	
0830 – 0900	Registration & Networking Coffee
0900 – 0915	**Opening Address:** Mark Riggio, Symposium Steering Committee Member
BIOFOULING MANAGEMENT: Regulatory & Implementation Practicalities	
0915 – 0935	**Biofouling Inspections: A Pillar in Biofouling Management** 2023 IMO BioFouling Management guidelines provide structured procedures for the prevention of the transfer of Invasive aquatic species from ship's hull. The importance of Biofouling inspection to maintain a hull free from fouling has long been overlooked. Bio-fouling inspections is been used as a measure to confirm hull fouling when other indicators highlights decrease in ships performance. This reactive approach costs fuel efficiency, increases GHG emissions and has the potential for the transfer of IAS. BMS wish to discuss a proactive way of using Biofouling inspection as a tool to identify potential marine growth, plan actions accordingly to reduce drawbacks of the reactive approaches. In addition to the above, we discuss the cost-effective, efficient BF inspections using ROV's and digital reporting formats. The digital reporting can feed back to ship's performance platforms and can be used to predict ship-based biofouling growth under certain conditions. **Speaker:** John Loaiza, *Managing Director*, **BioMarine Services**
0935 - 0955	**Mind the Gap: Analysis of Current Regulations** The procedure for the implementation and uptake of the 2023 Biofouling guidelines will not be uniformly applied across the world. There are specific regional requirements set by governments and regional organisations, different Port State Control interpretations and ultimately, a mixture of mandatory measures (regionally enforced) and non-mandatory guidelines as provided by the IMO. INTERTANKO has discussed the implementation of these guidelines and how it has been on a wholesale or partial basis with very little consistency, leading to discrepancies and uncertainties onboard. The aim is for these difficulties to be avoided during the development of the in-water cleaning guidelines. With these guidelines being a supplementary document to the 2023 Biofouling guidelines, a key area of their implementation is the notion of in-water cleaning and the services provided by ports and terminals. Without consistency, the crew and Port State Control Officers would be subject to further communication issues across the number of further mandatory environmental regulations that have been introduced in recent times. With shipowners focusing on the mandatory implications of CII, EU ETS and Fuel EU, environmental regulations and guidelines still play a pivotal role in day-to-day operations. Of key concern to INTERTANKO Members is the need for uniformity and consistency across the developing regulations, with overlap and confliction within the current framework causing

	further issues. While INTERTANKO Members adhere to all these requirements, the non-uniform nature complicates a trade where there is irregular and dynamic routing. **Speaker:** William Sturdy**,** *Assistant Manager,* **INTERTANKO**
0955 - 1015	**Technology outpacing hull cleaning regulations** Biofouling has been identified as a major vector for transfer of invasive aquatic species. Biofouling also has a major impact on the hull/propeller efficiency resulting in higher fuel consumption thus an increase of the operational costs and GHG emissions. Biofouling management has become crucial in present-day shipping and has drawn the attention of the stakeholders such as vessel owners, managers, charterers, local port authorities and various environmental agencies. Never before has vessel performance been more important than today, as new regional legislation in the form of the EU ETS (Emissions Trading Scheme) and international regulations such as the IMO Carbon Intensity Indicator (CII) rating system come into play, affecting charter party agreements and placing renewed emphasis on efficient operations. Hull cleaning and grooming technologies advanced in a faster phase. Advance robotics, Artificial intelligence, advancement in sensors, better internet connectivity to ships pave the way for wider range of hull cleaning/grooming technologies. However lack of standard / requirements for design and operations of these technologies could outlived its usefulness. **Speaker:** Sahan Abeysekara MIMarEST, *Principal Specialist - Environment, Technical Directorate***, Lloyds Register**
1015 - 1035	Panel Discussion, Speakers • John Loaiza, *Managing Director*, **BioMarine Services** • William Sturdy, Assistant Manager, **INTERTANKO** • Sahan Abeysekara MIMarEST, *Principal Specialist - Environment, Technical Directorate***, Lloyds Register**
1035 - 1100	Coffee & Networking
Ship Operations & Technology	
1100 - 1120	**Low biocide content paint, aiding to solve the biofouling challenge** Bio-fouling, invasive species, emission into air and sea and the marine environment generally are major topics within the sustainability agenda. Maritime stakeholders including the IMO (International Maritime Organization), the BIMCO (Baltic and International Maritime Council) as examples, several NGOs, ship owners, shipyards, ship managers, equipment manufacturers, Insurers, Bankers etc. all have bio-fouling on the agenda. I-Tech's presentation will give an overview about alternative technologies outside coatings. Furthermore, the presentation dives into under water coatings generics as well as into the substances and biocides being globally available making the coatings work. Dan Isaksson will elaborate further on the efficacy of biocides being designed against Hard- and Soft fouling and will additionally talk about the future. The question is in which concentration biocides and other substances are needed to balance the environmental impact of substances into the water versus emission into the air and the oceans.

	The presentation will inspire and neutrally describe low biocidal solutions using Selektope as an example. Dan will at the end elaborate briefly on the regulatory landscape of Selektope globally. Biocides in the marine industry are a well-established and environmental protecting tool. We believe that Selektope and other biocides correctly used at minimum levels in marine coatings together with other technologies protecting the hull are the future of modern hull management. The task is always to choose the correct coating specification, and the challenge starts when vessels are trading outside the specification selected by the user together with the paint manufacturer. At the end it is about balancing the environmental impact of biocides, which should be minimized, and the specific needs as without a profitable shipping industry, less investment potential for the sustainability agenda could be the consequence. **Speaker:** Dan Isaksson, *R&D Kemist*, **I-Tech AB**
1120 - 1140	**Performance Verification Study** Transport Canada is taking action to safeguard Canadian waters from the introduction and spread of non-indigenous species (NIS) through marine shipping. Vessel biofouling is one of the primary vectors for the transfer and introduction of NIS into Canadian waters. Biofouling occurs when microorganisms, plants, algae, and animals accumulate on structures that are exposed to an aquatic environment, such as a vessel's hull. This can bring foreign species to Canadian waters or move them between ecosystems within Canada. These species can become invasive and harmful in their new habitats. Additionally, biofouling can increase a vessel's drag, which leads to higher operating costs, fuel consumption, greenhouse gas emissions, and underwater noise. Since biofouling begins to develop within hours of a vessel entering the water, all vessels have the potential to transport NIS. A vessel's level of biofouling is affected by many factors including the condition and type of anti-fouling system (AFS), season, mooring time, vessel speed, recent travel history, and water salinity levels and temperature. Biofouling can be managed by cleaning a vessel in-water. However, it is important to note that cleaning a vessel in-water can also release organisms and contaminants into the environment. In-water cleaning with capture capability can help reduce this environmental risk. Subsea Global Solutions (SGS Diving) has been contracted to demonstrate to Transport Canada the Whale Shark LTD. water treatment system couple with EITHER the Subsea Global Solutions Remora In-Water Capture and Cleaning (IWCC) unit, the Eco-Friendly C-ROV IWCC unit, or handheld IWCC tools. SGS Diving has developed commercially available systems designed to operate in environmentally sensitive areas to support the maritime industries' need to perform in-water hull cleaning of vessels. The advanced IWCC system minimizes the risk of accidental discharge of invasive aquatic species, particulate, and soluble contaminants from a vessel's anti-fouling coating. The SGS Diving systems are developed to reclaim spoils and contaminants that may be released from the vessels during the hull cleaning process. The Whale Shark Ltd. water treatment process not only filters out contaminants that may be present as solid particulates, but also extracts soluble biocides that may be present in the contaminants extracted from the vessel prior to returning the processed seawater back to the marine environment. **Speakers:** Rick Shilling, *Executive Vice President, Technical Services*, **Subsea Global Solutions** Jonathan Baker, *Director of Marketing*, **Subsea Global Solutions**

1140 - 1200	**Proactive vs. Reactive Hull Cleaning** Biofouling is a persistent challenge that degrades vessel performance, increases fuel consumption, and contributes to the spread of invasive species. Traditional reactive cleaning methods, employed only after biofouling has taken hold, are costly, less effective, and environmentally risky. These methods often result in higher greenhouse gas emissions and inconsistent adherence to regulations. In contrast, proactive cleaning strategies, supported by emerging autonomous technologies, focus on preventing biofouling before it can establish, offering a more sustainable and economically sound approach to hull maintenance. Proactive cleaning not only keeps vessels operating at peak efficiency but also provides continuous hull mapping and data collection capabilities, which are critical for optimizing maintenance schedules and improving regulatory compliance. By conducting frequent, data-driven cleanings, these strategies enable more accurate monitoring of hull conditions, reducing the need for emergency interventions and the associated costs. This presentation will explore the advantages of proactive cleaning, including its ability to transform biofouling management, reduce operational expenses, and enhance both environmental and regulatory outcomes in the maritime industry. **Speaker:** Sidney McLaurin, *CEO*, **Fleet Robotics**
1200 - 1215	Discussion **Speakers:** • Dan Isaksson, *R&D Kemist*, **I-Tech AB** • Rick Shilling, *Executive Vice President, Technical Services*, **Subsea Global Solutions** • Jonathan Baker, *Director of Marketing*, **Subsea Global Solutions** • Sidney McLaurin, *CEO*, **Fleet Robotics**
1215 - 1330	Lunch (provided) – Hosted by Subsea Global Solutions
BALLAST WATER: Technology, Compliance & Enforcement	
1330 – 1350	**Reception: The Hidden Option in Ballast Water Treatment** When the 2004 Ballast Water Management Convention was written, it envisioned that one of the options for treating a ship's ballast water would be shore-based reception facilities. These facilities were envisioned to deal with ships that infrequently ballasted, ships ballasting in challenging waters, and ships operating in voyages outside their normal operating areas among many other special cases of treatment. And while the implementation of the Convention over the past 20 years has clearly demonstrated the need for answers to these challenging situations, the previous attempts to commercialize ballast water reception have proven unsuccessful and ballast water reception is still not a viable option for complying with the Convention. This presentation will focus on the latest developments in ballast water reception, including case studies of successful implementations of the concept as well as provide the roadmap for how ballast water reception is finally ready to take it's place at the table of viable options for ballast water treatment under the Convention. **Speaker:** Mark Riggio, **ecoHarbor Solutions**
1350 – 1410	**Compliance monitoring of ballast water treatment systems** This presentation will address the implementation of the Ballast water convention, and testing of compliance with the discharge standard. Compliance testing methods, practical

	experiences, results from tests and finally, the use of CMDs in the future maintenance monitoring requirements will be discussed. Speaker: Pia Haecky, *CEO*, **MicroWise**
1410 – 1430	**Technical Considerations for Sampling Ballast Water to Determine Compliance with Discharge Performance Standards** In order to discharge ballast in waters of the USA and Member States of the IMO, a vessel must comply with ballast water discharge standards (BWDS). In most cases, this involves use of a Type-Approved ballast water management system (BWMS). There are currently no requirements for regular compliance checks after a BWMS has been commissioned. Routine compliance checks, to enumerate organisms in treated discharges, are currently the only way to know if a system is meeting a BWDS. This policy brief has two objectives: 1) Highlight the importance of routine collection and analysis of treated ballast water discharges, and 2) Present technical considerations to perform compliance assessments, highlighting good practices for sample collection and analysis and advising of potential obstacles. These assessments are necessary to inhibit the spread of non-indigenous species. **Speaker** – Stephen Loiacono, Scientific Program Manager, **Golden Bear Research Center**
1430 – 1445	Panel Discussion Speakers: • Pia Haecky, *CEO*, **MicroWise** • Chris Todd, *COO*, **ecoHarbor Solutions** • Stephen Loiacono, Scientific Program Manager, **Golden Bear Research Center**
1445 - 1515	Coffee & Networking
	BALLAST WATER: THE FUTURE & OPPORTUNITIES
1515 - 1535	**Opportunities to improve compliance outcomes during ship ballast water inspections in Australia** Australia has a renowned reputation for maintaining a strong biosecurity system designed to reduce the risk of pests and disease agents entering, establishing, spreading and causing harm. With a 60,000km coastline, the vast majority of which is uninhabited, and >90% of Australia's exports relying on sea trade, the need for effective management of biosecurity risks associated with ships' ballast water is paramount. Australia, as a signatory to the International Maritime Organization's (IMO) Ballast Water Management Convention, actively regulates biosecurity risks associated with ships' ballast water and has been increasing its inspection presence at the border, as more ships reach their D-2 compliance date. Recent compliance experience indicates many vessels remain non-compliant with the BWM Convention – either due to documentary issues, the vessel not managing ballast water in accordance with their BWM plan, due to challenges in understanding how to effectively operate the installed ballast water management system (BWMS) and/or difficulties related to challenging water quality. The department has been sampling and analysing ballast water discharges for compliance with the regulation D-2 standard for nearly 5 years. Trends remain similar over sampling years, with ~30% vessels sampled failing the >50micron size class. To improve the effective and efficient regulation of biosecurity risks and reduce delays to ships at Australia's border during a ballast water ship inspection, the department is implementing a range of activities and measures to improve compliance outcomes.

	Recognising that the IMO is currently reviewing the BWM Convention, this presentation will provide key Australian ballast water policy updates and open opportunities for collaboration both to derive improved international policy solutions and develop complementary research and development activities related to biosecurity risks associated with ballast water. **Speaker:** Sonia Gorgula, *Senior Policy Officer*, **Australian Government Department of Agriculture Fisheries and Forestry**
1535 - 1555	**Ballast Water: Dead or Alive?** On Sep 8, 2024, the shipping industry reached an important date requiring mandatory compliance with the IMO BWM Convention Regulation D-2 ballast water discharge performance standard. The majority of ships in the global fleet have installed BWMS, and treated ballast water operations occur on a daily basis around world. The BWMS manufacturing industry is showing typical signs of market maturity with repositioning and acquisitions, along with a focus on support and service for their installed systems. While the impression could be that ballast water is therefore "finished" or "done" and there is nothing more to do, there are actually a variety of critical aspects that stakeholders are just beginning to gain experience with. Three key topics are: 1) building experience with the recently approved Guidance for ship operations in challenging water quality, 2) approvals for modified BWMS with existing type approval and the related impacts to shipowners, and 3) enforcement and compliance. As all stakeholders collectively enter into the next chapters of the ballast water management story, it's clear that ballast water is very much alive. **Speaker:** Marcie Merksamer FIMarEST, *Vice President*, **EnviroManagement, Inc.**
1555 - 1615	Panel Discussion, Speakers: • Sonia Gorgula, Senior Policy Officer, **Australian Government Department of Agriculture Fisheries and Forestry** • Marcie Merksamer FIMarEST, Vice President, **EnviroManagement, Inc.**
1615 – 1630	Chair's Day 2 Summary & Close of Symposium