



Meeting Report

11th Global TestNet Annual Forum

**12th to 14th February 2020
International Maritime Organization
4 Albert Embankment
London
SE1 7SR
United Kingdom**

**Final Version
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I Introduction

1.1 Venue

The 11th Annual meeting of the Global TestNet took place at in London (UK) from the 12th to the 14th February 2020 at IMO headquarters in London. The meeting welcomed members from many of the facilities and observers from US Coast Guard Independent Labs, Class Societies, international organisations and national research centres. A WebEx system was setup to allow others to join in.

Global TestNet would like to thank IMO for kindly hosting our annual meeting.

1.2 Attendees



Figure 1: Global TestNet 11th Annual Meeting Day 2 Attendees.

Table 1: Global TestNet 11th Annual Meeting Attendees

Name	Institute/Company	Biofouling	Ballast Water	
		Day 1	Day 2	Day 3
Afra Asjes	Wageningen Marine Research			
Aron Lank Jensen	DHI-DK			
Cees van Slooten	Control Union			
Claudia Dreszer	Ankron Water Services GmbH			
David Wright	ERS			
Erik Köster	Ankron Water Services GmbH			
Guillaume Drillet	SGS (Singapore)			
Ivan Lines	LR			
Jan Linders	GESAMP-BWWG			
John Alonso	IMO GloFouling			
Jung-Hoon Kang	KIOST			
Jurga Kononovaite	IMO Project Assistant for Glofouling			
Kelsey Prihoda	University of Wisconsin-Superior			
Kitae RHIE	GESAMP-BWWG, KH Univ			
Kyoungsoon Shin	KIOST			
Line Sverdrup	DNV GL AS			
Lilia Khodjet El Khil	IMO Project Manager for GloFouling			
Mario Tamburri	Alliance for Coastal Technologies and			
Martin Andersen	BW-Scaling ApS			
Matthew Kenney	Chelsea Technologies Ltd			
Pat Lewis	Biofouling Solutions			
Sahan Abeysekara	LR			
Shinichi Hanayama	Japanese Test Facilities & GESAMP-BWWG			
Stephan Gollasch	GCDC			
Stephen Loiacono	GBRC, Science Prog Manager			
Theofanis Karayannis	IMO Marine Biosafety			
Tim Fileman	PML Applications Ltd			
Thomas Vance	PML Applications Ltd			

1.3 Welcome Address

The Chair welcomed the participants of the meeting. Participants were reminded of the roles and goals of Global TestNet. Global TestNet depends on the effort of its members to be successful in offering support to stakeholders in the shipping industry. The Chair reminded the participants that in 2019 only a few members put effort into the tasks formulated during the previous Global TestNet meeting. For Global TestNet to be successful and also to be able to register as an NGO with the IMO, the amount of output from Global TestNet needs to be increased and therefore effort and involvements from members need to be continuously higher.

Finally, the Chair introduced the Global TestNet Biofouling Group and noted the importance of this development for the future of Global TestNet as an organisation. It was agreed to discuss the Terms of Reference for this group at the end of day one.

2 Updates of 2019 Activities

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2.1 Global TestNet Visibility

1. Global TestNet is a partner of GloFouling and therefore is introduced by the GloFouling team when the project is presented
2. Global TestNet efforts were presented as part of a presentation during the Ballast water technology Forum in Shanghai in September 2019 (G. Drillet)
3. The Global TestNet activities may be shared in the LinkedIn page which has been created <https://www.linkedin.com/company/global-TestNet/>. Members and their staff are encouraged to add their activities as part of Global TestNet in their non-for-profit activities on their profiles.
4. For social media communications by members, **#GlobalTestNet** should be used.
5. Presence in ResearchGate: <https://www.researchgate.net/project/GloBal-TestNet-THE-GLOBAL-BALLAST-WATER-TEST-ORGANIZATIONS-NETWORK>. Please add your relevant papers here too to help build the Global TestNet profile.

2.2 Membership

The Global TestNet membership status was presented with 19 current members at present:

1. Ballast Water Detecting Laboratory of Shanghai Ocean University
2. Busan Techno Park
3. Cal Maritime: Golden Bear Research Center
4. DHI Denmark
5. Environmental Research Services
6. GCDC (formerly DavidConsult & Go Consult)
7. Kaiyo Engineering Co. Ltd (FODECO)
8. Korea Institute of Ocean Science and Technology (KIOST)
9. Korea Marine Equipment Research Institute (KOMERI)
10. Laboratory of Aquatic Science Consultant Co.
11. Marine Biological Research Institute of Japan, Co., Ltd
12. Marine Eco Analytics (MEA-NL)
13. Maritime Environmental Resource Center (MERC)
14. Norsk Institutt for Vannforskning (NIVA), Norway
15. Great Waters Research Collaborative (GWRC)
16. Plymouth Marine Laboratory and PML Applications Ltd
17. Control Union Water B.V.
18. SGS Korea Co Ltd. Giheung Laboratory
19. Wageningen Marine Research

2.3 Development Company limited by guarantee/NGO Status for Global TestNet

The Secretariat reported the development of our application for the NGO status with the IMO. Our application for charitable status was rejected by the charities commission in the UK. We had been encouraged down this route by the IMO. It seems that we are able to obtain NGO status at the IMO as a company limited by guarantee (CLG). This involves registering Global TestNet as a CLG with Companies House in the UK. Global TestNet would then have a board of directors rather than trustees. The Secretary reported that he has investigated this route and it seems on the face of it to be relatively simple and inexpensive. There were 10 members present during the annual meeting who all expressed their willingness to contribute members fees once this is done. Therefore, the group agreed to go ahead with this development.

3 Day 1 - Biofouling

The day was started with short 5 min introductions by the members.

3.1 Update IMO GloFouling project; Lilia Khodjet

- Global TestNet is strategic partner of GloFouling
- Overall objective: Support implementation of IMO guidelines on biofouling in shipping
 - Promote and develop best management practices
 - Deliver capacity building activities in developing countries
 - Facilitate industry participation
 - Knowledge sharing about biofouling issues: what is the situation currently (scientific/operational/legislation)
- Many maritime industries involved in biofouling: oil and gas, commercial ships, deep sea mining, aquaculture and fishing renewable energy, recreational boating and measuring instruments.
- General information:
 - Joint global initiative: GEF (funding), UNDP (implementation), IMO (execution)
 - USD 6.9 M from GEF + USD 41 M co-financing
 - Run time: 2019-2023
 - Project concept: from global to local
 - Gender equality: role of women in biodiversity conservation
 - 12 direct beneficiary countries from the project (7 regions)/also other countries will benefit by regional headquarters
- Achievements so far:
 - In 9 of the 12 countries awareness raising workshop
 - In 9 of the 12 countries National Task Force formed
 - Website/Social media
 - Webinars of different subjects
 - Awareness raising animation
 - Global Industry Alliance, launch during MEPC 75, 30th of March 2020
 - 3 R&D fora are planned, first was in Melbourne in October 2019
- Planning:
 - Develop best practices
 - Studies on impact of biofouling management of GHG emissions
 - Training packages development + delivery
 - Global guides
 - Pool of expert consultants
 - WISTA is partner; joint activity is IMO conference session on biofouling management in Hamburg on 15 September 2020
- In-kind expertise/training by Australia
- Joint project on pleasure craft (best practices)
- Development of awareness: movies/virtual reality
- GESAMP working group 44

There are also initiatives from the countries with IMO help. The countries need to create an action plan, upload their progress on the IMO website. There is for instance already an initiative

to develop learning material for schools.

The structure of GloFouling follows that of GloBallast with Global TestNet as a group of testing people involved in biofouling. It was stated that this group can take the lead/support one of the activities as shown in the presentation. There is also research into in-water cleaning technologies.

It was noted that biofouling is more interesting for the shipping industry, because there is a payback in terms of lower fuel consumption. It was suggested that it would be interesting to go to the shipping industry to see if for a small fee they would for instance help with research, since they will also benefit in the end.

The question was asked whether Global TestNet would be writing a testing guideline for in water cleaning devices? The participants in the meeting raised concerns about the limited number of participants with expertise in this area of work and concluded that Global TestNet would be better engaging with additional potential new members before starting such a task..

A question was asked about whether any regulations were enforced for the handling of the waste from in-water cleaning. However, in most countries there are no regulations in place, only recommendations. This is one of the reasons for GloFouling coming into being. The best practices related to in-water cleaning will tackle the management of waste and the waste related to cleaning in dry dock. The governments of USA and New Zealand are working on this topic, but there is no global framework in place to date.

It was noted that biofouling is relevant for a lot of industries and GloFouling questioned whether Global TestNet would consider supporting GloFouling for technical aspects beyond shipping. Global TestNet was setup in the first place with the objective to improve the reliability of BWMS testing under the umbrella of GloBallast. It took a long time before test facilities would share, because of the commercial interest issues. In 2018, Global TestNet members decided to include Biofouling as a topic and approved the development of a Biofouling group. For biofouling there is no convention yet. Rather, there are small patches of regulations worldwide which need to align. Also, some countries might only implement regulations when there is a convention. Global TestNet members concluded that at this stage, the organisation was not ready to support GloFouling with issues beyond shipping and suggested that other professional organisation such as World Aquaculture Society for Biofouling in Aquaculture would probably be more appropriate.

It was noted that ports will need certainty on the requirements for cleaning approach and environmental protection before they will offer in-water cleaning more widely. In many cases, In-water cleaning is not allowed because there are no regulations to operate under. Additionally, then there is the cost-efficient handling of waste from in water cleaning which must be considered and although some countries are working on handling the waste at present it often ends up being discharged to the environment. The group was reminded that Global TestNet can have the mandate to support IMO in developing Guidance if registered as an NGO at IMO.

3.2 Presentation: How to undertake biofouling inspections to determine regulatory compliance/efficacy of in-water cleaning; Dr Patrick Lewis

- Biofouling Solutions:
 - In-water inspections on ships all over the world
 - Biofouling Solutions have developed their own line of in-water cleaning appliances
- Biofouling Solutions started based on species-specific management from the Australian government
 - It was found that 1 in 5 vessels has a pest living on the Hull, sea chests....
- Based on IMO Biofouling guidelines: threshold basis instead of species-specific
 - California
 - New Zealand: <20 days opposite to >20 days stay by ship
- GloFouling will probably be a source of knowledge development for the initialisation by member states to develop more effective regulations
- Coatings
 - Both biological and non-biocidal exhibit fast (~1 month) biofouling growth, with invasive species hidden in between.
- Mass of biofouling coming from an oil rig is around 160 tons.
 - Costs: €500,000 per day/ Time needed to clean: 30-50 days
- New Zealand regulations have generated a growing demand for in-water cleaning services
 - Pacific nations concerned over NZ risk management strategy because ships will be coming to their ports to avoid going to NZ.
- Grooming vs cleaning
 - Grooming = functional cleaning
 - Laminar flow surfaces
 - Propellers
 - Not the same as cleaning as performed before significant growth occurs
 - Focuses on microfouling/light macrofouling
 - Cheaper to do early grooming
- Cleaning for biosecurity: most risks contained in niche areas on the vessel (sea chest, bulbous bows, etc.)
 - Reclaim technology needed
 - Filtration targets:
 - Biologicals = minimum viable propagule
 - Biocides = typically different regulatory body (complex filtration, ambient levels in ports high).
- New Zealand regulation: inspect/clean within 30 days
 - Can we keep wetted areas on 1% fouling and niche areas on 5% with a 60-month dry docking cycle? Answer is no unless you use in-water hull cleaning.
 - Question asked about where Global TestNet might be of help:
 - When to do the inspection?
 - When to clean?
 - Approved technology?

- Approved methodology?
- Inspection protocols?

Question: If the coatings are applied and used correctly, are most antifouling coatings effective?

Answer: The more effective coatings work in the wetted areas when applied correctly, but not in the niche areas. There is a need to recognize the flow patterns on a hull and match them with the right kind of paint. Focus Global TestNet possibly on standardising technologies that might be used in the niche areas because technologies nowadays are not made for niche areas.

Question: What is your experience with ultrasound and how do you think that hull grooming will affect coatings?

Answer: There have been emerging ultrasonic technologies that have come and gone a few times. It has potential, but not yet in the market.

Some paint producers tested the influence of grooming on the paint and concluded that grooming will affect the lifetime of the paint. There are grooming systems out there, but are often not as effective. Most grooming is still performed by divers.

Question: After grooming, you could use a 50 µm filter for treatment. Is there a potential for distribution of the smaller organisms? Do you consider secondary treatment? Did you test prevention technologies other than painting?

Answer: The filter treatment is more effective with finer filters e.g. 12.5 µm. There are a few companies experimenting with secondary treatment.

With regard to prevention technologies, some test done with adhesion properties but haven't found the golden bullet yet. There will always be a residual risk. We have to determine what threshold we accept, and what technology works, instead of looking for one that eliminates it all.

Question: What coating types in use today?

Answer: Some ships use silicon foul release coatings while others still use traditional biocidal coatings (of which there are a few different types/technologies). There are also coatings that combine these technologies. Foul release coatings need flow and they are easily damaged and there are concerns about in-water cleaning/scrubbing.

3.3 Presentation: A planning project on development of control technology of marine biofouling in Korea; Jung-Hoon Kang

- Biocidal coatings in combination with in water cleaning → problem with waste
- Risk assessment and management based on scientific evidence
- Eco-friendly in water cleaning techniques
 - Capture systems: up to 100% possible?
 - Filtration and UV/Electrolysis treatment of waste?
- In-water cleaning devices (Republic of Korea)
 - You want cleaning → suction/capture → filtration → post-treatment
 - Debris and dissolved matters?
 - How can we consider and measure the extent of suction/capture during and after cleaning?
 - What sizes of mesh are best for filtration?
- We need a scheme for risk management for in-water hull cleaning activities

- Management of effluents discharged from in-water cleaning (Based on guidelines)
 - Biological risk assessment
 - Chemical risk assessment
- Contents under consideration for the planning project
 - Development of control technology for biofouling
 - Assessment and management of biofouling related risks
 - Regulation and policy for control of biofouling
- KIOST developed biological risk assessment for in-water hull cleaning and analysis and assessment methods for active substances from AFS.
- Port management?
- Toxicity of effluents on marine organisms
- Future considerations
 - How to increase credibility of risk assessment?
 - How to authorize in water cleaning devices as eco-friendly and efficient?
 - Port management plans needed

Question: How do you choose relevant controls when you do toxicity tests? The ambient water around is not always beneficial for the species that you test.

Answer: Ambient water collected before cleaning, close to the side.

Question: Malformations in the flat fish. Is consistent with copper? Or other?

Answer: They used the whole effluent mixture; they do not know the different chemicals. In practice, the risk assessment is based on individual tests or understanding what might come from ships as a first step.

Question: Viability of organisms in receiving water; Did you test viability of organisms on hulls in Korean water?

Answer: They incubated and monitored the waste water for viability of organisms. More experiments are needed.

Question: Are there tests done to compare the toxicity of organisms when removed from the hull compared to the leakage from the coating?

Answer: Not yet.

3.4 Discussion: Testing of biofouling control technologies (like coatings, UV systems, Ultrasonic systems, and pipe system cleaners); Thomas Vance

- Focus on other biofouling control technologies than paints.
- Global TestNet: develop test protocol for ultrasonic systems, because it's not yet independently tested.
- You also have UV systems, that work for niche areas. There is not yet a standardized test for it.

Question: Do you want us to develop something like the G8?

Answer: Guidance for testing that sort of technologies is required so, for instance, ship owners have information on what to invest in.

Question: Have clients already requested evaluations?

Answer: Yes, but specific tests are needed. We need general guidelines on what to focus on for tests.

Question: What is the benchmark?

Answer: At the moment there are coating industry standards that work and are accepted. The regulation on coatings (AFS convention) works by exclusion as listed in the Annex I of the Convention: “You cannot use tributyltin”. Need to keep in mind what the end-user wants with the technology. It would be nice for Global TestNet to start on something where we can get consensus. It would be nice to know how to test systems so you know what systems works best for a certain ship.

Question: By having fouling in your niche area, does that cause fouling on other parts of your hull?

Answer: There is a potential, but it is not researched yet.

Question: If you found them on the hull, are they also in the niche areas?

Answer: Often yes, particularly on ships that operate outside the parameters of the coating, so for instance if they are lying still.

Question: There are no guidelines but if we want to help the testing committee, we need a structure that is generally accepted, like from the IMO. Then we need to bring together the guidelines already made from the various governments together.

Answer: Type approval of the antifouling coatings is not based on the efficacy, but on the toxicity. No universal testing. Benchmark some technologies: are they environmentally sound? Efficacy? Would be very difficult because of the large commercial interests. As a general goal, the ultrasound testing could be one. However, there are no guidelines for testing. There are only protocols from test facilities on how they tested the systems. If we want to make a guideline, it has to be able to be used globally. So, what is a minimum standard we can accept globally and work from there? Experience tells us that testing doesn't work everywhere. Not everywhere is suitable. Also, you have the temperature/salinity effect. But if you go into too much detail, testing cannot be done anywhere, and this makes implementation difficult. You should make a guideline that works globally and adjust the testing to application protocols that work regionally (like the old G8 Guidelines).

There are protocols used in the coating industry, but it is a long way away from being merged into a guideline.

Question: Age effects of coatings?

Answer: They know, but it's a complex set of efficacy information to get together from the manufacturers. But if we put something together on too little knowledge, it might not get to the right conclusion. We need to base it on rigid testing. We could make a general guidance document which does not have to be the final version with comments to be welcomed.

Paint producers do not give information about the efficacy of their paint over time, only the end point. Is it not better to mandate paint producers to give more information about their efficacy?

Question: Is it possible to produce a paper from Global TestNet for the IMO with these concerns and what we want so that the IMO can take it up.

Answer: If we are an NGO then we could propose this to the IMO meetings. For now, you need a member state to come with a proposal.

Question: Is it possible to add a test protocol to the guidelines?

Answer: You could have a specific guidance added to the guidelines. After PPR7 it will be more clear which way this discussion is going.

Proposals:

1. Making the ballast water guidelines was very hard and took a lot of time. What if for now we make a testing guidance, a guidance from people that do the testing, and put it on our website? When we are an NGO, we can transform this into a proposal to IMO. Alternatively, we can ask a country to put it on the table at the IMO. If it is on the table, people will be interested to comment on it.
2. The Chair reminded the participants that Global TestNet reason to exist it to develop universal and comparable, robust testing protocols.
3. The group agreed that starting by picking up the right technology to develop a guideline where none exist is probably the best exercise to do for Global TestNet: for instance ultrasonic systems.

3.5 Presentation: Evaluation of in-water cleaning (IWC) systems; Dr Mario Tamburri

- How to quantify biofouling on ships?
 - How much area is there?
 - Niche areas?
- Goals
 - Develop/refine protocols and methodologies to evaluate IWC system performance and impacts
 - Work transparently and collaboratively toward comparable testing of IWC systems around the world
 - Provide independent evaluations
 - Support innovations that increase vessel fuel efficiencies while decreasing the release of vessel pollutants and biosecurity risks.
- Continuum from reactive IWC to remove macrofouling to proactive IWC to prevent macrofouling (grooming)
 - How well do they clean?
 - How well do they reduce biosecurity risks?
 - How well do they reduce water quality risks?
- Evaluation test protocols:
 - Document variables: vessel, environmental, IWC system
 - Experimental design: unit of replication is the vessel
- Removal/prevention of macrofouling
 - BACI design

- Biofilms and macrofouling
- Presences/absences (not live/dead)
- Photograph quadrates or diver point counts (low visibility)
- Removal 1 week, prevention 9 to 12 months
- Water quality impacts
 - Characterize the environment
 - Quantify ambient/background variability (before, during and after IWC)
 - Sample during IWC
 - Biocides
 - TSS
 - PSD
 - Microplastics
 - Capture/Retention Efficacy
 - Treatment/Debris Removal Efficacy
- Microplastics: those which are <5 mm
 - ~40 % of most marine coatings use microplastics as binding agents
- Evaluation Test Protocols
 - Impacts of cleaning on coatings
 - Operator variability
 - Fuel Efficiency (ISO19030-2)
- Closing thoughts
 - These are the early days
 - Rigorous, independent and comparable evaluations of IWC systems are possible but methods will evolve
 - Standardize test protocols are important for acceptance, approvals and cross comparisons.
 - IWC system testing and results should inform the development of IWC standards
 - Current IWC systems may address vessel operational needs but biosecurity and water quality may still be a challenge
 - Current systems are designed for hulls and not niche areas, and capture approaches vary greatly
 - Need for uniform terminology – removal and prevention
 - We need to move away from macrofouling IWC without capture and better understand risks of biofilm removal.

Question: Niche areas are critical for spreading invasive species. Should we focus on how well systems clean niche areas or do we focus on hull areas?

Answer: The market is for the hull areas. We talked to vendors and they said they could adapt their technologies for niche areas. It is something we want to do, but none of the vendors come forward with it.

Question: Would the experimental approach for the niche areas be more difficult than the hull area?

Answer: Before/after biofouling could be determined the same way. Influence on area would be more difficult to determine, but protocols could be adapted.

Question: A lot of combinations are required to set the test up. What do you think about the idea of test centres that have the availability of a standard shape (with geometrical) with standard coatings to remove some of the variables when doing a test?

Answer: Similar to land-based (control setting) and shipboard testing for ballast water. Test centres will have different coatings and different fouling. How many coatings do we test? Ship shapes are complex, do we get every difficult shape? Perhaps a random selection of quadrants on large area? Not taking into account niche areas. In different zones (flat bottom, flat side, etc.) they random select areas. Niche areas are a different zone. Ships can also have different coatings on different parts of the ship, so this should also be different zones.

3.6 Discussion: Whatever comes to the table

3.6.1 Theofanis Karayannis (IMO): News on PPR7

- Identify key elements guidelines biofouling
- Correspondence group formation that will consider these key elements and respond back for PPR8
- What might these key elements be?
 - Background concerns
 - Practical issues to implementing guidelines
 - In-water cleaning
 - Lack of facilities
 - Biofouling management plans and record books
 - Variability in their efficacy
 - Minimum requirements (more concrete)
 - Ship-specific
 - Contingency measures
 - Limits for fouling on hulls
 - Management practices validated
 - At dry-dock assess achievement of management practices
 - Regular inspection of coating/amount of fouling
 - Niche areas
 - Focus of ship-owners on fuel consumption, not on niche areas
 - Technologies
 - In-water cleaning
 - Best practices
 - Consistent standards

3.6.2 Terms of Reference for the Global TestNet Biofouling Group

First tasks of group:

- I. Target: In-water cleaning
 - What:

1. Provide guidance on what is important to test, make a list of key points, and propose some standard methods if any, make reference to existing standards and protocols.
 2. Compare guidelines from different countries and find gaps compared to the Global TestNet important key points.
2. Target: Formulate testing guideline for MGPS (Marine Growth Prevention Systems)
- What:
 1. Make a draft guideline

Other options:

- Paint efficacy
 - Get the industry to give their efficacy results
 - You need 60 months
- Pro-active grooming: how often do you have to do this?
 - Oceanographic information: How do one knows when to clean the hull?
 - Temperature
 - Nutrients
 - Operation
 - Chlorophyll
 - DHI worked on models to predict biofouling on ships both in Denmark and in Australia
 - The group Concluded that predicting biofouling is not related to testing per se and therefore is should not be considered by Global TestNet at this time (something for IMarEST?)
- The Group agree that the focus should be to produce testing guidelines, because they do not exist
 - Ultrasonic systems
 - MGPS:
 - Biofouling accumulation
 - Biocide injection
 - Etc.
- Imitate/Artificial biofilm to make comparability between test facilities possible: standardization
 - Biofilm formation depends on a lot of external factors and flow dynamics
 - Base artificial on representative natural biofilm

3.6.2.1 To do list

Action	Subject	What	Who	Deadline	Finished
1	Biofouling	Global TestNet slides for biofouling presentations by members	Guillaume & Tim	30 April 2020	
2	In-water cleaning	Extract from Mario protocols what important key points are when testing	Mario Tamburri & Guillaume	30 April 2020	
		Send key points to Global TestNet members for comments	Global TestNet members	31 May 2020	
		Get a list of the existing guidelines	Anna Yunnie	???31 May 2020	
		Compare key points with existing guidelines	Distribute to Global TestNet members	??? 31 July 2020	
3	MGPS	Draft guideline for a standard testing method for a MGPS	Pat & Thomas	30 April 2020	
		Send draft guideline for comments	Global TestNet members	31 May 2020	

4 Day 2 – Ballast Water

The second day of the meeting focused on the ballast water.

4.1 Presentation: Experiences with commissioning testing; Guillaume Drillet

- Sampling and testing water from BWMS can be done in multiple occasions
 - Type approval
 - Commissioning
 - Survey and Certification
 - Port State control
- However, at this stage, a particular ship may only be tested for its capacity to meet the D-2 standard during commissioning.
- Sampling & testing for commissioning
 - Part of G8: objectives set in circ.70
 - Sampling of 3 m³ is in the code, but not in circ.70
 - Sampling according to guidelines G2 (but G2 is an old Guideline, older than the revised G8 (Code))
 - Analyses according to circ.42.rev I
 - Upcoming ISO 11711 (for accreditation of facilities in ISO 17025)
- What is commissioning?
 - IMO requirement (G8/Code for Approval of BWMS); but also
 - A normal commercial requirement before acceptance and final payment
 - GOAL
 - Acceptance of installation
 - MAIN PLAYERS INVOLVED
 - BWMS Vendor, Ship-owner, Class,
- So far, SGS has tested with BV, KR, NK, DNV-GL, LR,
- Circ. 70 BWMS Commissioning testing guidance
 - Approved at MEPC73(BWM.2/Circ.70)
 - Two samples, intake (ambient) and discharge, taken according to guidelines G2 (→ comparison)
 - At least indicative analysis for all D-2 parameters
 - Including self-monitoring parameters and system design limitation parameters of the BWMS – but BWMS approved under the 2009 G8 guidelines may be installed until oct 2020 and are not required to report any SDL parameters in the TA (yet).
- Intake and discharge sampling
 - Intake sampling by any practical means
 - In-line sample: most ships do not have sample points on the intake line (before BWMS)
 - Harbour sample taken close to the ship when ballasting operations occur
 - Ballast tank sample for ship which have ballasted untreated ballast water
 - Some class only required chemical parameters (DOC, POC, UV-T, etc.)
 - Some class have requested not to take any inlet water sample
 - Discharge sample, corresponding to the intake sample
 - Depending on minimum holding time on type approval certificate, intake

and discharge sample may not be taken on same day

- Sometimes >0.1 mg/L Cl_2 at discharge is accepted, because the system works (kills organisms) and neutralization depends on calibration of the systems → training personnel
- Indicative and detailed analysis (BWM.2-Circ.42-Rev.1)
 - Indicative analysis is relatively quick indirect or direct measurement of a representative sample of ballast water and may include
 - Detailed analysis as supported by Global TestNet communication from January 2019
- Analysis parameters
 - No indicative methods exist to evaluate the concentration of E. coli, Enterococci and V. cholerae which can be used without laboratory incubations
 - Therefore, testing facilities must have a laboratory within a couple of hours
- Observations from testing
 - ~40 tests since November
 - 18% failures
 - Non-compliance are found for the largest size fraction (>50 μm). Detailed analyses proposed when indicative fails (detailed analyses prevail over indicative analyses)
 - Always compliant with 10-50 μm (no need for MPN methods as used for type approval).
 - Failures on TRO discharge (not required by some classes, not always reported) but failures are recurrent.
 - Installation not made according to design approved by class (a few cases)
 - Impossibility to verify G2 sampling point installation (already welded in discharge line)
 - Installation not compatible with ISO11711-1 (not a requirement)
 - Installation limiting sampling (low pressure, air in the pipes, too small sampling probe).
 - Crew feeling untrained (often crew complains about training received from BWMS manufacturer)
 - No calibration certificates present (some cases it may be onboard, but the crew is stressed by the event)
 - BWMS log data cannot always be extracted because of the format in which it exists and the lack of training of the crew in extracting these data.
 - Class present to witness the tests in ~74% of the cases
 - Manufacturer present to support the commissioning test in ~63% of the cases
 - Questions from manufacturer or ship owners about approval of methods by class is recurrent
 - Discrepancies between Class HQ and Class surveyors' positions and understanding (very common).

Question: Is there sufficient support to remove bacteria from commissioning testing (PPR7)?

Answer: Circ.70 talks about all size classes in D-2. In D-2 there are two size classes mentioned plus indicator microbes, so does Circ.70 actually mean only test for the 10-50 and >50 ? It is a guideline, so every country needs to decide for themselves what to implement. However, the

statement that all bacteria die during treatment is not correct. The bacteria we measure (E. coli, Enterococci, V. cholerae) may die or not regrow, but other bacteria that are for instance harmful for other industries such as aquaculture may do (e.g. Vibrio parahaemolyticus).

Question: Representative sampling can be less than 3 m³ and still be relevant e.g. 10 min sampling (leaving out the first and last 5 minutes because of debris), 3 times is representative over the discharge (e.g. EMSA guidelines). Asking to do always 3 m³ during commissioning is a lot.

Answer: Type approval uses 3 m³, because it is statistically relevant; see Miller et al 2011.

Question: Should Global TestNet release a Statement that the volume sampled should be less than 3 m³?

Answer: Statement from Global TestNet should be based on more data because there is obviously no consensus at this stage. More research is required to determine the best sample strategy.

Question: Are the MPN methods sufficient for 10-50?

Answer: We have not experienced any fails on 10-50 µm size class, only >50.

Comments: ATP method has been tested and compared to MPN and to FDA/CMFDA staining counts for UV system. ATP indicative methods is comparable to MPN. The risks with MPN is that non-compliance observed in the size class 10-50 can be due to contamination. Class decides if a test is redone.

4.2 Discussion: Commissioning testing

Global TestNet should be careful that the objectives of the convention are not lost because of wrong guidance from our side.

Proposal: Is it valuable to make a statement by the group for IMO to only test 10-50 and >50 µm and exclude bacteria for commissioning testing and make a statement about the sampling size?

Decision from the members: No, at this stage it is too late to impact the decisions which will be made during the PPR7 meeting. Also, if bacteria are removed from the testing, the stakeholders indirectly remove the need to use laboratories and this also removed the requirements for testing under ISO 17025. For Global TestNet members it means that quality assurance may be diminished and many organisations without proper understanding of BWB testing will start testing without qualifications.

InterManager has submitted a paper to PPR7 to raise the need for ISO 17025 accreditation of testing bodies.

Type approval is done in small scale, with a few tests and a lot of details while Commissioning and Port State Control is carried out on virtually all ships. For these different testing objectives, the sampling method can be optimized and indicative analyses for Commissioning and Port State Control can be used for this purpose even if Global TestNet has agreed that detailed analyses are better. Commissioning testing is not yet mandatory, it is a guideline, while the ballast water convention is mandatory. The mandatory aspects of commissioning testing only comes into force October 2021. It is therefore difficult to convince stakeholders to carry out detailed analyses even if it would be advantageous.

Commissioning testing was suggested by the ship owners to see if the BWMS was installed correctly. The testing may be carried out using the same volume as proposed during type approval. There is a statistical method to determine what the best sample size is based on different parameters (Miller 2011). Yet, the Code refers to that the testing should take into account sampling bias and the more volume is filtered, the longer it takes, the more organisms that die: therefore, high sampling bias.

Comment: Are there any indicative analysis which can be used for UV-systems? Yes, two of the members confirmed that the ATP results are giving end points which are close to that of MPN for the 10-50um size Class. Does this take into account the different doses that some UV systems can produce? Potentially yes, however, commissioning is always done under IMO-mode. Statistics is based on perfect sampling and perfect circumstances.

What to do when you detect non-compliance?

Some BWMS have IMO and USCG modes (Often the dose is higher in USCG mode). During commissioning which is required by IMO, the IMO mode should be used but this cannot always be verified by the sampling team because the testing facility should not be in charge of using the BWMS (it is the responsibility of the crew). Yet, the sampling team should check that the BWMS is working correctly.

4.3 WET discussion on Algal tests; Line Emilie Sverdrup

- GESAMP repeating issue
 - OECD201: Exponentially-growing cultures of selected green algae are exposed to a test substance under defined conditions. The inhibition of growth is measured relative to a control culture.
 - GESAMP BWSSG in 2019: Half of algae WET tests in BA/FA applications did not fulfil validity criteria in OECD201
 - Main issue is the section-by-section growth rate
 - How can procedure be improved to meet validity criteria?
- Recap OECD201 validity criteria
 - 1. Biomass increase in the control by a factor of at least 15 within the 72-hour test period
 - 2. The mean coefficient of variation for section-by-section specific growth rates.
 - 3. The coefficient of variation of average specific growth rates.
- OECD201: Substantial differences between the section-by-section growth rate and the average growth rate indicate deviation from constant exponential growth and that close examination of the growth curves is warranted
- Responses from Global TestNet:
 - Wrong species or strain
 - Different species of the same genus differ in growth rates
 - If lab results are not consistent with standard methods and literature, double check the taxonomy
 - Example: *Skeletonema marinoi* mistaken for *S. costatum* – *S. marinoi* could not sustain continuous growth over 72h

- Marine algae for brackish water testing
 - Algae cultivated in marine water often do not perform well if put directly in 20 PSU. 1-2 weeks pre-culture.
 - Testing below 20 PSU is a challenge for *S. costatum*. Adding brine ins not approved by GESAMP BWWG. *Isochrysis* can be used for low PSU, but no QA/QC references available for the species.
- Initial density
 - Some labs use measured values for initial density
 - OECD201: (...) using the nominally inoculated biomass as the starting value rather than a measured starting value because in this way greater precision is normally obtained
- Density/biomass in general
 - One lab used fluorescence directly, without microscope calibrations (now corrected). One lab uses microscope calibrations for every test, in this required?
- Conclusions
 - Species determinations of cultures could be an issue
 - Species must be selected with test PSU in mind
 - Acclimation of cultures for planned test PSU
 - Initial density should reflect known growth rates
 - Nominal rather than measured initial values reduce variability
 - Other items?

Question: *Isochrysis* is especially sensitive, so not a representative influence of substance. GESAMP already specified *Skeletonema*. Why do they not mention the second species by name?

Answer: They wanted to keep some flexibility around the globe. The addition of a second could be discussed. If you use *Isochrysis*, GESAMP will see that the requirements from OECD201 will not be met. GESAMP does not specifically require the most sensitive species. There is variation with *Isochrysis* currently being most sensitive, but next year we could discover another.

Question: Norway provided input about the sampling and sampling handling before you do the WET-tests which might be included by GESAMP. How do you sample from sampling point to container, storage of containers, etc.?

Answer: We believe this is included in OECD201. If the target substance can be easily volatile, it could be determined before and after test to determine the exact exposure.

Question: GESAMP sampling framework is very comprehensive for DBP. Can this be more relaxed?

Answer: This is already done by removing the chronic tests.

4.4 Presentation: Introduction on Japanese test facility, Shinichi Hanayame

- Three test facilities are registered as the members of Global TestNet, namely:
 - Kaiyo Engineering Co., Ltd
 - LASC
 - MBRIJ

- There are no ILs in Japan; no activities related to USCG approval

Question: Can Japanese test facilities stay in Global TestNet, even though they do not currently test?

Answer: In our bylaws there is a law that you should be active in testing, but no time frame. There is no rules on how to exclude participants which are not active anymore. But we would expect participants to be active, to give feedback. Tomorrow we will discuss about the future of Global TestNet and the registration as an NGO at IMO.

Question: Is there something going on at IMARI?

Answer: Yes, but not for ballast water system testing.

4.5 Discussion: *Vibrio cholerae* O1 and O139 toxicity – D-2 standard vs IMO G8

- They are two different types of *V. cholerae* O1 and O139: toxic and non-toxic.
- IMO G8 (test validity criteria) does not differentiate between the toxic and non-toxic forms
- IMO D-2 seems to recognize this and talks about “toxicogenic *Vibrio cholerae* (O1 and O139)”
- Does anyone do both colony blot and DFA tests on individual colonies form a TCBS assay?

IMO D-2 mentions toxic *V. cholerae* in the background document, but not in the part of the Code (G8) that talks about test validity. If a treatment is effective at killing *V. cholerae*, it should be enough as an end-point for type approval testing.

However, from a Port State Control point of view, the toxigenic evaluation may be necessary because it is the standard. One argument is a public health issue instead of a ballast water issue. *V. cholerae*, being an indicator microbe, being toxic or not, it necessary for Port State control.

Global TestNet in the past has had a discussion about replacing *V. cholerae* with another indicator microbes, because *V. cholerae* is not common in most waters, so it's hard to verify that a BWMS kills it, if it is not in the water. Cosmopolitan microbes should be used. However, literature study; the target bacteria from D-2 do not survive treatments in general.

In the purpose of testing, it is important to know if the system works in killing or not. How many bacteria come from the discharge treated water? Careful to make a conclusion that if a system successfully eradicates the three indicator microbes, it is completely free of microbes initially.

We know that in the tank there is regrowth of bacteria and facilities have seen this regularly. This is also confirmed by 1000's of VGP tests carried out globally where sometimes the total heterotrophic bacteria loads at discharge is very high.

DHI and NIVA assessed how common technologies handle certain microbes, like *E. coli* and *V. cholerae*.

Conclusion: From an enforcement point of view, the D-2 is actually quite clear and includes toxigenic testing. From a type approval testing point of view or initial testing for compliance, we might be looking at the wrong indicator microbes.

4.6 Presentation: The role of test facilities in model validation in scaling of BWMS; Martin Andersen

- BW-Scaling
 - Company from Martin Andersen and Dr. Peter Vittrup Christensen
 - Modelling of scaling
- Modelling
 - Hydraulics: CFD model (stream lines)
 - Fluence rate field (ray tracing)
 - Combined in particle tracing model
 - Results in dose accumulation and distribution graph
- Ongoing developments
 -
 -

4.7 Presentation (Remote): USCG VIDA, Viability Assessment, and the Draft Policy Letter. What can Global TestNet do to help? ; Kelsey Prihoda

- Vessel Incidental Discharge Act (VIDA)
 - Four purposes
 - Establish uniform, environmentally sound standards and requirement for discharges incidental to the normal operation of a vessel, including ballast water
 - Charge USEPA with primary responsibility for establishing discharge standards
 - Charge USCG with primary responsibility for administering and enforcing discharge standards
 - Preserve the flexibility of the States and certain regions of the US with respect to administration and enforcement of pollutants.
- Important
 - VIDA requires review of BWMS TA testing methods
 - "...the terms 'live' and 'living' shall not ... preclude the consideration of any method of measuring the concentration of organisms in ballast water that are capable of reproduction"
 - Enter the DRAFT POLICY LETTER:
 - Issues 26 July 2019
 - No TA testing protocols (Based on best available science) for BWMS That render organisms non-viable
 - Letter established the process for USCG acceptance of TA testing protocols
 - No FINAL POLICY LETTER has been published yet.
- Process

- BWMS manufactures must identify in the OMSM whether the BWMS is: 1) designed and intended to render nonviable organisms or 2) designed and intended to kill organisms in ballast water
 - If 1, then ILS use USCG-accepted protocols for viability assessment
 - If 2, then ILS use live/dead analysis methods specified in ETV protocol
- Introductions for submitting testing protocols
 - Validation data
 - Laboratory testing using at least five unique taxa
 - Field testing conducted in at least four different locations including a range of salinity conditions
 - Demonstration the method can be used to distinguish between organisms temporarily and permanently rendered nonviable
- Freshwater Validation of MPN-Based Method
 - Project led by U.S. Naval Research Laboratory and funded by U.S. Environmental Protection Agency
 - Validation conducted from September 2018 to January 2019 in Duluth-Superior Harbour of Lake Superior
 - Two-step technique:
 - Microscopic, motility technique applicable to heterotrophic organisms
 - MPN technique applicable to photoautotrophs only
 - Comparison of results to vital, dual-stain analysis method specified by the ETV Protocol
 - Demonstration of competency prior to conducting validation
- Discussion
 - Did the USCG get it right? Are there no methods based on “best available science”?
 - If yes, what does this mean for UV systems that have been approved under IMO guidelines?
 - How many test facilities are using viability assessment methods during land-based type approval testing?
 - Is it feasible to conduct viability assessment methods during shipboard type approval testing?
 - Are any test facilities currently doing this?
 - Can organisms be temporarily rendered nonviable?
 - Is it possible that a single viability assessment method could be utilized in multiple locations globally?

Not all test facilities in Global TestNet use MPN. Three SOPs from NIVA, DHI and Golden Bear were shared in an INF paper at PPR4. NIVA proposed to make one approach for all test facilities that use the same method, but no methods were shared with the other members.

It was noted that there is a Rule of 6 hours for analysis, for organisms. The 10-50 µm stay alive after 6 hours. Ankron have considered MPN for shipboard testing, but this method is not easy portable. Rather than starting the MPN incubation time on board they travel the sample to a land-based lab for analysis. However, this is not always possible. They use ambient water as medium.

Problem with CMFDA is fall positives/negatives, like some organisms do not stain. Thinking about on-site method. However, it was noted that in many cases labs are not available everywhere in the world for analysis. Also, the lab needs to be certified, an agreement with them is needed in advance, etc.... this may work in USA, but some members learnt also there that very simple things like transport of samples on time, even on relatively short distances, is unreliable.

Question: Method used for MPN had a 14-day evaluation time. How do you use it onside?

Answer: Like IDEXX method, use a small incubator that you take on the ship, incubate or take home with you for incubation method. However, MPN is not a portable method (in air travel) as the setting would need to be water tight and the required incubation conditions (, e.g., temperature, light duration and intensity) cannot be guaranteed so that the incubation needs to be finished before the sampling team can travel home, especially when air travel is needed. DHI conducted tests to make the method portable, with an uncertain outcome. MPN is a yes/no for growth.

It was noted that there's a need to validated methods of MPN for microbes. Lot of progress for MPN for 10-50 µm.

Question: How do you evaluate >50 µm viability? Regrowth? Some have life cycles of months/years. Viability should be for all size classes. If regrowth should be accepted by USA regulations, the pre-requisite is likely that it should apply for all size classes

Answer: Live/dead is more stringent. If we evaluate, we should not talk about what method is better, but what are the strengths and limitations. Evaluation of the methods is different: MPN has to be perfect, FDA has to be okay. Strengths/limitations to see if we can come up with a better evaluation method of MPN. US believed there were no protocols based on best available science at the moment of the policy letter. It is thought that the 10-50 µm MPN method has not yet been validated to the required standards. Furthermore, bacteria already use viability, so not live/dead. So, there is already a difference.

One member has not used MPN for a number of years for 10-50. They say that the rules haven't been set up on a straightforward way. The thought that every MPN method should be exactly the same is not necessary. Every MPN method can be made a specific way and analysed/validated statistically based on its design.

Global TestNet could issue a position statement. There is no one-size-fits-all method that could be used all over the world. But you would like to have one method that can be replicated. Problem is that MPN cannot be done one way, because it depends on for instance source water. However, the standard could be to "Use the temperature from the source water" but how do you standardize the lighting? USCG is looking for a standardized method to enforce, but the question is if this is possible for MPN or not.

Maybe, make a standard for the end-point of the MPN (e.g. no growth after a fixed period of time) but do not try to standardize the method. There are no requirements from the USCG on how to test MPN.

- **How can Global TestNet help?**

- Public comment period ended 30 September 2019
- Is there a need for Global TestNet to issue a position statement with regard to the draft policy letter?
- Can Global TestNet propose validation guidance and/or provide resources for members?
- What do we consider the “best available science”?
- Is it beneficial to have peer review of protocols developed by other test facilities?
- Is it possible to develop a harmonized, “Global TestNet-approved” protocol?
 - No
- Effort to compare Global TestNet members’ methods started in early 2019, led by Stephanie Delacroix (NIVA)
- MPN is good to use during Type Approval, because the test facility determines species diversity in water. It is more difficult during commissioning and port state control.
- D-2 standard is an instant standard. It should be instant dead. Not over 2 weeks.
- 25 years ago, research into the influence of UV on >50 um. After 8 days <10% survival, but never 100% wiped out.
- Possibly used FDA to check the MPN method.
- There are BWMS with IMO TA validated with MPN, but during commissioning there was not a problem. If there was a problem with MPN, it would come up during commissioning.

Question: What is the position of the US members of Global TestNet? Because if no, then we cannot help.

Answer: USCG does not know how to validate, because they do not have the internal expertise. Global TestNet could come up with a protocol how to validate the MPN method.

4.8 Port State Control – David Wright (discussed on day 3)

- Some administrations look to Global TestNet for guidance on testing in port.
- Some administrations will make PSC only an administrative exercise, no tests.
- SGS has collected information on what works and what does not work for PSC, for the IMO experience building phase.
- Some administrations will enforce, but most probably would not.
 - Most PSC follow IMO guidance; step 1 is documentation and it often stops there.
- Does Global TestNet believe that a BWMS needs to be tested regularly for efficacy regardless of whether PSC is checking it?
 - Regular checks improve efficacy
 - Need to make it mandatory, because else shipowners might not do it.
- Guidelines for Port State Control have sampling as a last resort, but in the starting paragraph it tells that the guideline does not limit the PSC’s right to sample.
- We can recommend what Global TestNet thinks is appropriate for PSC testing
 - Not sure if we can have input on mandatory yearly tests

- Yearly test should be on output water, like VGP, not on input water
- Of course, Global TestNet should not recommend, as it is a conflict of interest, because the members will benefit from these tests. Global TestNet should also not do this, because it is potentially a big political discussion.
- We should instead make our governments aware and they should put this in.
- Possibly propose checking the system every 5 years at renewal survey?
- Deviate between port state and flag state problem.
 - Who will pay for the invasive species problem?
- Sensors to check functioning?

4.9 To do list

Action	Subject	What	Who	Deadline	Finished?
1	V. cholerae	Ask if Louis would be able to share what Vibrio sp. were found in both uptake as discharge treated water	Afra Asjes	21-02-2020	Y
		Overview of Vibrio sp. in uptake and discharge treated water	Louis Peperzak	27-03-2020	Y
		Ask members if toxicity is analysed for every yellow colony or not; make a comparison chart	Tim Fileman; Stephan Gollasch & Tim Fileman	21-02-2020; 14-07-2020	
		What research is necessary to find an alternative microbe for V. cholerae? For all three performance tests: TA, commissioning and CME make an internal guidance document?	Stephan Gollasch & Tim Fileman	31-12-2020	
2	MPN	Review PPR7/21 document: Proposed protocol for the verification of ballast water compliance monitoring devices	Tim Fileman email everybody	20-03-2020	
	MPN	Decide if Global TestNet wants to formulate a protocol how to validate MPN method	Everybody	20-04-2020	
3	Report	Template for Executive Summary for test facility reports	Martin & Afra	27-03-2020	
4	Algae WET-test	Have the Global TestNet members used the GESAMP excel for the Algae WET-tests? Ask members and reply back to Jan	Guillaume & Tim	21-02-2020	

5 Day 3 – Ballast Water and Administrative Matters

5.1 Discuss Actions from 2019

1. **Readiness Evaluation** - Jan Linders agreed to share additional information on the development of readiness evaluation dossiers.
 - Not necessary anymore.
 - GESAMP generally does not receive readiness evaluation (as in G8/Code) when the dossier comes to them. Administrations should do this. GESAMP does not know if they do this. Does Global TestNet know?
 - Problem for IMO/The Administrations, not for Global TestNet.
 - Readiness evaluation often done before the start of Final Approval, not for Basic Approval.
2. **Augmentation & DBPs** - Jan Linders agreed to combine the data from different test facilities to support this task and ensuring the removal of sources of the data. Control union would then carry out the evaluation.
 - Not yet.
 - Action point for 2020
3. **Excel Sheet on Calculation of the QAQC for algae tests** - Jan Linders agreed to share the XLS calculation sheets with the interested members.
 - This was done.
4. **WET Testing Technical Discussion** - The members agreed that DNV-GL (represented by Line Sverdrup) could lead the technical discussion for the members and with the following ToR:
 - Develop guidance on the quality criteria to be used for WET testing using the GESAMP approach as a starting point for discussions;
 - Evaluate the relevance of sub-lethal tests in the risk assessments carried out during basic and final approval (and define acute/chronic for this purpose);
 - Evaluate whether more than one (1) WET test per salinity is necessary/appropriate to evaluate risks;
 - Evaluate the usefulness of ship-board WET tests and their applicability;
 - Develop guidance on the sampling and handling of samples for the tests to be carried out;
 - Lead, when necessary and in full transparency, discussions between Global TestNet members, GESAMP and US administrations (EPA and USCG).
5. **Viability** - Stephanie Delacroix (NIVA) agreed to combine procedure information from the facilities using this method in order to support the development of a consistent methodology among our members.
 - No
 - Discussed yesterday; follow-up with that action point
6. **Inadequacy of *Vibrio cholerae* in Compliance Testing** - Stephan Gollasch agreed to prepare a statement for review by the members on the inadequacy of *V. Cholera* testing when doing compliance testing.
 - Not completed
 - Discussion from yesterday continues this action.
7. **Experience Building Phase** - It was felt that the terminology of the different methods

used should be clarified. Guillaume Drillet agreed to take on the first round of this semantic exercise and share with other members prior to communication on via our website.

- Not yet.
 - Goal for 2020.
8. **New Biofouling Group** - Global TestNet agreed to work toward the production of guidance from its biofouling group of experts and Anna Yunnie from PML agreed to take the lead in supporting the cohesive development of that new group within Global TestNet.
- Done
9. **Port Database** - Kelsey agreed to initiate communication with Allegra to understand what was achieved before she left and share this with the members.
- She spoke with Allegra late last year: When Allegra was with Northeast-Midwest Institute (Washington, D.C., USA) she conducted a project assessing what information was available on water quality and biology conditions within commercial ports globally. The report was issued 01 November 2016, and she can send it to members if they are interested. Many Global TestNet members were involved in this project as part of its technical advisory group. As part of this project, Global TestNet members did send information to Allegra regarding ranges of certain parameters (UV transmittance, salinity, total suspended solids, concentration of organisms >50 µm, etc.). Again, these were ranges and not empirical data.
 - When it comes to the development of the database, Allegra does not believe that she received specific ballast water uptake data from any Global TestNet members for incorporation into the database. She had no files to send. Kelsey also spoke with Stephanie Delacroix, and although she believes that NIVA sent shipboard testing results to Allegra for incorporation into the database, she wasn't able to find the file containing the results that she sent to Allegra.
 - GWRC has funding from U.S. Environmental Protection Agency's Great Lakes Restoration Initiative to develop a Great Lakes commercial port database. We will incorporate any data sent to Allegra by Global TestNet members into this database, however, it does have to be developed around Great Lakes ports primarily because that is the purpose of the funding. I think this is a good compromise.
 - **So, again, any Global TestNet members who sent shipboard ballast water uptake data to Allegra to incorporate into the database that was being developed in 2017-early 2018, please send those data to Kelsey and we will incorporate into the database we are currently working on.**
10. **ISO Filter Testing** - Kelsey agreed to retrieve this presentation and share it with the members and Stephanie Delacroix agreed to request the release of the information on this topic from DNV-GL as tests facilities have been working with DNV-GL on this topic.
- On 03 June 2019, Tim shared with all Global TestNet members the presentation that Allegra gave to the ISO Ballast Water Working Group (BWWG). In that message, we also posed a question to members regarding the objective of Global TestNet's proposed ISO filter test method. This was a follow-up question for Allegra to pose to the group after she met with ISO in 2018. We received only one response to this message.
 - Kelsey spoke with Carolyn Junneman, chair of the ISO BWWG, and learned the

process for ISO standard method development. We need to start with a proposed method, and bring it to the table. During a Global TestNet steering committee meeting, we agreed that she should start the ISO standard method and then send it to members to review. She has not yet started the method. **If this is something that members are still interested in accomplishing, we will make this a goal for 2020.**

11. **Ring Testing** - Stephan Gollasch agreed to keep the group updated as soon as he has information on ring testing.

- Ongoing
- Stephan will be asked in a few weeks to test if the BSH tank is homogenous.
- After this, labs will be asked to come and count the water.
- For EBP

5.2 Future of Global TestNet

- Create company limited by guarantee to get NGO status for IMO (similar to a charity, but simpler)
 - Need Board of Directors instead of Trustees
 - Address will be c/o PML
 - Membership fee: ~ £1000 GBP; Also, possible observer fee: ~? Pounds (to be decided)
 - Deadline is end of March for IMO NGO application
- Need to have support from members, because Tim and PML will commit itself to make a company at their address
- Support from Members for Company limited by guarantee:
 - GCDC
 - SGS
 - PML
 - KIOST
 - Japanese test facilities
 - Golden Bear
 - Wageningen Marine Research
- Associate members (observers)
 - Chelsea Technologies (awaiting response managing director)
- Bylaws will be shuffled to make a constitution for the company
- Based on discussion, decision was to go ahead.

5.3 Administration of Global TestNet

5.3.1 Bylaws

1. Law 26 that confidential information shared between members will be kept confidential for 3 years. The Chair proposed to add an additional by-law refereeing to the recording of discussions during the meetings of Global TestNet. The proposition for by-law changes should include that recording may be acceptable if all members of the Global TestNet

present at a meeting agree with the recording and on the basis that the recording should be destroyed after recording of the minutes.

2. Global TestNet has a conflict of interest policy: members cannot work together with for instance manufacturers. There is a potential conflict of interest which has been raised to the Steering Committee and the Steering Committee with investigate (A letter should be sent to the Member and clarification should be made).

5.4 To do list

Action	Subject	What	Who	Deadline	Finished?
1	Bylaws	By-Law Changes	Tim Fileman	14-03-2020	
		Investigate potential conflict of interest	Guillaume Drillet & Tim Fileman	28-02-2020	
2	Augmentation & DBPs	Combine the data from different test facilities to support this task and ensuring the removal of sources of the data.	Jan Linders	14-06-2020	
		Carry out the evaluation	Control Union	14-10-2020	
3	WET-tests	Ask Line how far they are with action points + continue with action points in 2020	Guillaume Drillet	21-02-2020	
4	EBP	Make a semantic list of terms for EBP	Guillaume Drillet	14-06-2020	
5	Port water quality	Share report of 01-11-2016 on water quality and biology conditions within commercial ports globally with Global TestNet members	Kelsey Prihoda	28-02-2020	
		Ask clarification of Kelsey where the purpose of the database is, what is the structure, uptake only limited to inside ports and if the data will be available for Global TestNet members? Email answer to members	Afra Asjes/Tim Fileman	21-02-2020	Y/N
		After reaction from Kelsey, Global TestNet members will share data for database with Kelsey.	Kelsey Prihoda	31-12-2020	
6	Filter test	Draft internal method for filter testing based on regulations with two sections: comparing filters and challenging the filters (limit test)(not via ISO) and ask input from relevant members.	Kelsey Prihoda	14-07-2020	
7	ISO	Ask within SGS how GTN could give input to ISO methods	Guillaume Drillet	14-04-2020	

8	PSC	Ask members if they agree with releasing a GTN statement that GTN advises to do regular testing to check if the BVMS meets the D-2 standard	Guillaume Drillet	28-02-2020	
9	Election	Send email to members what was decided as chair, secretariat and steering committee: Stephen Loiacono and Afra Asjes and then ask if somebody opposes.	Tim Fileman	21-02-2020	

6 Elections

The group finally voted for the new 2020 Steering Committee and Secretariat. No members expressed interest or were proposed to take on the position of Chair and Secretariat. The members praised the efforts of the Chairman and the Secretariat in supporting the development of Global TestNet. The existing Chair and Secretariat have agreed to continue their efforts at least until the NGO status is gained so that future incumbents will be able to concentrate on taking the organisation forward. Stephen Loiacono from Golden Bear expressed a wish to join the steering committee and Kelsey Prihoda stood down.

The 2020 Global TestNet steering committee is as follows:

- Guillaume Drillet (Asia, Chair)
- Afra Asjes (Europe)
- Stephen Loiacono (North America)
- Tim Fileman (Secretariat)

The meeting was then adjourned.

Annex I: Meeting Agenda

Agenda Global TestNet – 12-14 February 2020

International Maritime Organization
4, Albert Embankment
London
SE1 7SR
United Kingdom

Day I - 12th February 2020 – Biofouling

- 09:00-09:30 Walk-in & coffee
- 09:30-09:45 Opening by chair Guillaume Drillet
- 09:45-10:30 Short 5-min introductions by participants: What have you been working on in 2019?
- 10:30-11:00 Update IMO Glofouling project
Lilia Khodjet El Khil, PI Glofouling, IMO
- 11:00-11:15 Morning coffee
- 11:15-11:45 Presentation: How to undertake biofouling inspections to determine regulatory compliance / efficacy of in-water cleaning.
Dr. Patrick Lewis, Principal Scientist, Biofouling Solutions
- 11:45-12:15 Presentation: A planning project on development of control technology of marine biofouling in Korea
Jung-Hoon Kang, Korea Institute of Ocean Science and Technology (KIOST)
- 12:15-13:15 Lunch
- 13:15-14:15 Discussion: Testing of biofouling control technologies (like coatings, UV systems, Ultrasonic systems, and pipe system cleaners)
Thomas Vance, Research and Development Manager, Plymouth Marine Laboratory
- 14:15-14:30 Afternoon coffee
- 14:30-15:00 Presentation (Remote): Evaluation of in-water cleaning systems
Dr. Mario Tamburri, Director, Alliance for Coastal Technologies and Maritime Environmental Resource Center
- 15:00-15:30 Discussion: Whatever comes to the table

15:30-15:45 Closing remarks by chair Guillaume Drillet

Day 2 - 13th February 2020 - Ballast Water

09:00-09:30 Walk-in & coffee

09:30-09:45 Opening by chair Guillaume Drillet

09:45-10:15 Short 5-min introductions by participants: What have you been working on in 2019?

10:15-10:45 Presentation: Experiences with commissioning testing
Guillaume Drillet, Regional Business Development Manager - Marine Services, SGS

10:45-11:00 Morning coffee

11:00-11:30 Discussion: Commissioning testing
- Problems at dry dock
- Detailed vs. indicative analyses

11:30-12:00 Discussion: Meeting the D-2 standard in port
- What ballast water testing capabilities (if any) are in place worldwide?
- What antifouling capabilities are being planned by the respective PSC agencies?
David Wright, ERS

12:00-12:30 WET discussion on Algal tests
Line Emilie Sverdrup, Principal specialist (ecotoxicology), DNV GL AS

12:30-13:30 Lunch

13:30-13:45 Presentation: Introduction on Japanese test facility
Shinichi Hanayama, ClassNK

13:45-14:15 Discussion: *Vibrio cholerae* O1 and O139 toxicity – D-2 standard vs IMO G8
There are two types of O1 and O139 V.C.; toxic and non-toxic. IMO D-2 seems to recognise this and talks about “toxicogenic Vibrio cholerae (O1 and O139)”, but G8 does not (“the density of Vibrio cholerae (serotypes O1 and O139)”). What are the implications if for the D-2 extensive testing for toxic V.c. is necessary?

14:15-14:45 Presentation: The role of test facilities in model validation in scaling of BWMS
Martin Andersen, Director, BW-Scaling ApS

14:45-15:00 Afternoon coffee

15:00-15:30 Presentation (Remote): USCG VIDA, Viability Assessment, and the Draft Policy

Letter.

What can Global TestNet do to Help?

*Kelsey Prihoda, Researcher and Great Waters Research Collaborative Program Manager,
University of Wisconsin-Superior*

15:30-16:00 Closing remarks by chair Guillaume Drillet

Day 3 (morning only) - 14th February 2020 - Ballast Water & Admin Stuff

09:00-09:30 Walk-in & coffee

09:30-09:45 Opening by chair Guillaume Drillet

09:45-11:00 Future of Global TestNet

11:00-11:15 Morning coffee

11:15-12:15 Discuss action list meeting 2019

12:15-12:45 Administrative business Global TestNet

12:45-13:00 Final remarks by chair Guillaume Drillet