Meeting Report

10th Global TestNet Annual Forum

14th to 15th February 2019
The Institute of Marine Engineering, Science and Technology
1, Birdcage Walk
London
SW1H 9JJ
United Kingdom

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1 Introduction

1.1 Venue

The 10th Annual meeting of the Global TestNet took place in London (UK) on the 14th and 15th February 2019 at IMarEST headquarters in London. The two day meeting welcomed members from many of the facilities and observers from US Coast Guard Independent Labs, Class Societies, international organisations and national research centers. A WebEx system was setup to allow others to join in.

Figure 1: Global TestNet Members and Observers at 10th Annual Global TestNet Annual Forum in London.

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

1.2 Attendees List

Table 1: Global TestNet 10th Annual Meeting Attendees

Name	Institute/Company
Torben Madsen	DHI-DK
Wellym	DHI-DK
Li Gang	ex DHI
Guillaume Drillet	SGS (Singapore)
Stephan Gollasch	GCDC
Christopher Brown	GBF
Kelsey Prihoda	Great Waters Research Collaborative (GWRC) University of Wisconsin Lake Superior Research Institute
David Wright	ERS
Tim Fileman	Plymouth Marine Laboratory (PML) & PML Applications Ltd
Stephen de Mora	Plymouth Marine Laboratory (PML) & PML Applications Ltd
Klaas Kaag	IMARES
Afra Asjes	IMARES
Etienne Brutel de la Riviere	MEA-NL
Cato Tjabbes	MEA-NL
Astrid Hoogstraten	MEA-NL
Louis Peperzak	Control Union Water B.V.
Jeong-Kyeong Park	KOMERI
Myung-Baek Shon	Korean Register
Kyoungsoon Shin	KIOST
Stephanie Delacroix	NIVA
Prof Wu	Shanghai Ocean University
Anna Yunnie	PML Applications Ltd
John Alonso	IMO Marine Environment Division – GloFouling Project
Theofanis Karayannis	IMO Marine Environment Division – Head of Marine Biosafety
Kitae RHIE	GESAMP-BWWG, KH Univ
Jan Linders	GESAMP-BWWG
Line Sverdrup	DNV GL AS
Carine Magdo	Ballast Water Monitoring Solutions
Ashok Srinivasan	BIMCO

1.3 Welcome Address

The Chair welcomed the participants of the meeting and thanked the Steering Committee for the strong support in the preparation of the agenda. Participants were reminded of the roles and goals of Global TestNet. Global TestNet is a technical organisation that gathers its members from multiple international companies involved in the evaluation of systems developed for shipping that help minimize the risk of bio-invasions. While being strongly anchored in science, Global TestNet is not a research organisation and its members have the mandate to work with

other stakeholders (e.g. policy makers, regulatory bodies etc.) in a pragmatic approach to ensure that the environmental benefits are achieved.

The group agrees to work by consensus and to use the voting rules from the bylaws only where or when necessary. The Chair reiterated the importance of positioning Global TestNet as an organisation which offers support to other stakeholders for them to better understand what is feasible or not when dealing with type approval testing, compliance monitoring, efficacy testing etc.

Finally, the Chair emphasized that the creation of the Global TestNet Biofouling Group was to officially occur during this meeting and noted the importance of this development for the future of Global TestNet as an organisation. Global TestNet is therefore opening its membership to new organisations involved in non-ballast water related activities, finalizing a transition which was initiated more than a year ago.

Shortly after this introduction, the group agreed on the agenda of the meeting (Appendix 1) and made a round of introductions to welcome new individuals who had not been present in previous Global TestNet meetings

2 Updates of 2018 Activities

2.1 Conferences

Global TestNet has been present at Conferences and meetings and/or was introduced in panel discussions as follows:

- World Ocean Council (Sustainable Ocean Summit (Hong Kong) presentation of Global TestNet and objectives vis-à-vis of the BW management and Biofouling (Guillaume Drillet)
- 2018 International BWT Forum (Shanghai; Guillaume Drillet)
- 2018 BWMTech Panel Discussion (Fort Lauderdale - USA) (Chris Brown)

The technical agenda proposed at the 2018 (9th) annual meeting was followed up and the following are to be noted:

- Protists in the <10um size class – 1 position paper (http://www.globaltestnet.org/getattachment/Discussions/GBTN_Subsized_Protists_Position_Paper_Final_V030818.pdf Allegra Cangellosi)
- Update of the comparison charts (http://www.globaltestnet.org/getattachment/Discussions/GloBal_TestNet_Methodology_Comparison_Tables.pdf) (Stephan Gollasch and Tim Fileman)
- Port Database (Allegra Cangellosi – Abandoned)
- Filter test protocol (the Shanghai test) – No advancements
- Communication on the closing of 2 land-based test facilities (http://www.globaltestnet.org/getattachment/Home/GloBal_TestNet_Statement_2nd_February_2018.pdf - all members)

2.2 Global TestNet Visibility

1. To support the visibility of the Global TestNet activities a LinkedIn page 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.
2. Please use **#GlobalTestNet** for tweets and communications.
3. 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.

2.3 Membership

The Global TestNet membership status was presented and with regret DHI requested that DHI Singapore is removed as a member. Global TestNet has 19 current members as of today:

1. Ballast Water Detecting Laboratory of Shanghai Ocean University
2. Busan Techno Park
3. Cal Maritime Golden Bear Facility
4. DHI Denmark

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

2.4 Development Charity/NGO Status for Global TestNet

The Secretariat reported the development of the application for the charitable status under the UK Charity Commission. The trustees proposed for the initiation of the organisation are:

- Mr. Tim Fileman
- Dr. Guillaume Drillet
- Professor Stephen de Mora
- Dr. Christopher Brown
- Mr. Dandu Pughiuc

The search for new trustees to support the development of the organisation in the long term was noted to be crucial and therefore the group proposed a few names of potential professionals to be involved in the future.

3 Day 1 - Presentations and Technical Agenda

3.1 Chemical and Type Approval

The first presentation was made by GESAMP (Represented by Jan Linders). After a short introduction to GESAMP and its roles, the readiness evaluation of ballast water treatment systems that use active substances was discussed as it is part of the basic and the final type approval process. A temporary readiness evaluation has also been accepted in the past. The group put this information in the context of the biological efficacy testing (G8 and Code) under which the evaluation is required to ensure the safety of personnel from testing organisations. Jan Linders agreed to share additional information on the development of readiness evaluation dossiers.

Jan Linders then initiated a discussion on the quality criteria for Whole Effluent Toxicity (WET) tests and on the formation of precursor Disinfection By-Products (DBP). GESAMP wishes to apply the criteria proposed by the OECD 201 guidelines and asked the opinion of our members about this potential development.

There were concerns about the achievement of the validity criteria in the OECD TG 201 algal growth inhibition tests and discussions about the differences between the ISO10253 and the EPA 821_R/013 guidelines took place. This discussion was followed by a presentation on the impact of additives-augmentation/environmental factors used during land-based testing on the formation of DBPs. The group recognized the technical efforts made by the scientist in the organisation but other facilities mentioned that their evaluation of similar information from their own facility gave contradictive results. It was therefore proposed to use the developed framework by Control Union and use data from the other members to evaluate the origins of the observed differences. 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.

Additional limitations were also discussed for the chronic test to be carried out in the USA (or under the USCG testing protocol) because some of the US-EPA 2008 VGP tests are not executable in all conditions but ship-board WET testing, while not being used in most test facilities, is considered possible but not practical.

The Members hesitated in taking a decision during the meeting because some of the experts were not present in the room and therefore it was agreed to work toward a consensus following member's experiences. Jan Linders agreed to share the XLS calculation sheets with the interested members.

The group agreed to work on a series of tasks that Global TestNet would like to look into and the development of terms of reference (ToR) for the team that will work on this topic. The members agreed that DNV-GL (represented by Line Sverdrup) could lead this 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).

3.2 Viability

This presentation introduced recent changes in US regulations via the Vessel Incidental Discharge Act (VIDA). VIDA establishes a new framework for the regulation of vessel incidental discharges under Clean Water Act (CWA) Section 312(p). VIDA requires EPA to develop performance standards for those discharges within two years of enactment and requires the U.S. Coast Guard to develop implementation, compliance, and enforcement regulations within two years of EPA's promulgation of standards. Basically, VIDA forces to USCG to consider viability as an approach to evaluate BWMS. New scientific data shows that the UV dose required to kill organisms and measure "live" numbers using the FDA/CMFDA method could be a factor of 10 higher than simply rendering them non-viable and measure using the MPN method. The use of MPN is considered an equally good methodology (as opposed to FDA/CMFDA) for the 10-50 micron size class by some facilities. Other facilities do not use MPN because it is not yet considered fully validated. In practice the methodologies used by the different test facilities implementing this approach are not aligned (some of this information was shared during the IMO's PPR4 meeting). There is no existing regrowth method for zooplankton. 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.

3.3 Port State Control, Compliance and Efficacy

This presentation focused on compliance by Port State Control (PSC). Parties to the BWM Convention have a PSC obligation to verify that ships entering their waters are in compliance with the Convention. Article 9 stipulates that PSC can inspect a ship to check for proper documentation and allows PSC to take ballast water samples at any time. Guidelines to support the efforts of PSC have been developed and the sampling (when necessary) should be done according to the G2 sampling guidelines under the BWM.2-Circ.42-Rev.1 Annex2 guidance. Under the US EPA Vessel General Permit regulations ship-operators are required to carry out efficacy monitoring every year and submit results to the EPA. The requirement for the VGP however is limited to a few microbiological and chemical parameters. Experience from some of our members who have been carrying out >1000 compliance tests under the VGP reported that in general ships can manage to meet the VGP criteria (>95% compliance). Some members mentioned a potential conflict of interest from having been involved in the type approval to

carrying out compliance testing but the members in general were of the view that the expertise of testing organisations was necessary (and helpful) to support PSC in their work. Yet, one presentation on Compliance reported that there was a real limitation to the convention in that PSC officers are not keen on enforcing the ballast water regulations and therefore, potentially, are putting the entire BWM convention at risk (paper from David Wright to be share once published).

A presentation on the testing and evaluating of the Ballast-Wise instrument developed in Denmark followed. The group was of the view that there should be some validation of indicative methods such as this before such tools are accepted for use by PSC for example. The group also agreed that the monitoring of V. cholera was not necessarily insightful. It was thought that this indicator organism was not useful for the evaluation of the efficacy of BWMS. The US EPA for example requires that efficacy is evaluated using heterotrophic bacteria (which is not listed in the IMO BWM Convention D-2 Standard). Stephan Gollasch agreed to prepare a statement for review by the members on the inadequacy of V. Cholera testing when doing compliance testing.

Sampling of ballast water onboard ship was also considered a potential issue because some reports from a research cruise on ballast water sampling showed that plastic based samplers have been reported to explode during sampling. A few ballast water sampling devices exist (e.g. SGS discharge sampler) and the members mentioned that other devices are being developed in testing facilities.

3.4 Commissioning Testing

This presentation discussed the recent IMO release of guidance on commissioning testing that was approved at MEPC 73 (Circ.70). This requires that two samples are taken (intake and discharge) but only requires the use of indicative analyses for the evaluation. After the group discussed the limitations created by such an approach, it was agreed that we would prepare a Global TestNet communication during the meeting. This was put online shortly after the meeting. http://www.globaltestnet.org/discussions. The text is as follows:

The members of Global TestNet, during their 10th Annual meeting in London 14th & 15th Feb 2019 have discussed the commissioning of ballast water management systems (BWMS) on ships and the approach recommended by the International Maritime Organisation (IMO) through the guidance documents (IMO BWM.2/Circ.70 and the Code for approval of BWMS). Having tested BWMS for more than 10 years, the members see these documents as an important aspect of the implementation of the convention because this commissioning should provide ship owners with the certainty that the BWMS, after their installation, meet the D-2 ballast water performance standard of the convention. Yet, the group would like to add the following recommendations which should, if possible, be used:

1. *The members of Global TestNet recommend the use of detailed sample analyses whenever possible to ensure high reliability and relevance of compliance data for the ship owner. The additional costs associated with detailed sample analyses is considered minor compared to the cost of representative sampling. Further, the time required for detailed sample analyses is comparable to that of indicative methods.*

2. *The members of Global TestNet have also raised concerns that the sampling of water during the intake of ballast water may not be possible because ships may not be fitted with sampling facilities on the intake lines and therefore a representative intake sample cannot be taken. Global TestNet recommends the installation of an intake sampling port enabling representative sampling.*

3. *The members of Global TestNet have raised further concerns regarding potential insufficient concentrations of organisms in the intake water to ensure that the commissioning test can confirm proper BWMS installation. Therefore, the organism concentration in the intake water should be higher than on discharge.*

3.5 Experience Building Phase

The IMO presented an introduction to the BWM Convention's experience building phase. Global TestNet members and observers discussed the limitations of the reporting of data to the IMO by administrations. It was felt that the terminology of the different methods used should be clarified. The members agreed that it there is potentially valuable work that Global TestNet could perform to support the authorities in their work. 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.

4 Day 2 - Biofouling and Anti-Fouling Presentations and Technical Agenda

4.1 Introduction

The second day of the meeting focused on the development of the Global TestNet Biofouling Group.

4.2 The IMO's GloFouling Project & AFS Convention

The GloFouling Project leaders presented an introduction to the project. Global TestNet has offered a letter of support to the development of the GloFouling project and has agreed to develop a working group dealing with biofouling issues. Another presentation from the IMO introduced the AFS (Anti-Fouling Systems) Convention and discussed the differences from the biofouling issue.

4.3 Other Anti-fouling and Biofouling Work by Members

There followed a presentation on the anti-fouling and biofouling research taking place at NIOZ. This was followed up by an introduction to ongoing developments in Korea where KOMERI is building a full-scale test bed with fully controlled water quality parameters that will be used to evaluate the capabilities of in-water hull cleaning equipment. The test bed is expected to be fully operational in 2020 after its construction in 2019. This was very welcomed by the members and there was agreement that more on this topic should be done.

A further presentation introduced the members to the biofouling activities taking place at Plymouth Marine Laboratory and in particular their experience with in-water hull cleaning and regulators. During discussions there was a strong request that Global TestNet experience from working under the umbrella of GloBallast could be very constructive to the development of an international framework for type approval testing, compliance monitoring of these systems.

BIMCO was also invited to the meeting to introduce their work on underwater hull cleaning guidance. BIMCO is already working on this topic with the following objectives:

- the result of the cleaning is in accordance with a set of specifications;
- the environmental impact of the process is controlled;
- coating damage is controlled; and
- the cleaning process is planned, safe and effective.

Global TestNet agreed to work toward the production of guidance from its 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.

4.4 Other Topics

Finally, the members agreed to discuss technical topics which were not initially added into the agenda. The group discussed the evolution of the port water quality database. This follows from Allegra Cangelosi, who was working on this topic, having moved to become free-lance. The group realize that it will now be difficult to know what was achieved. Kelsey agreed to initiate

communication with Allegra to understand what was achieved before she left and share this with the members.

The group also discussed the filter tests program that was planned as a technical task in 2018. In order to add a new filter as part of a BWMS, the USCG requires that 3 additional tests are carried out at each of the salinities in the regulations. This is considered different from the upgrade of a specific filter. The group agreed that the testing of filters as part of a BWMS and the challenge of a filter with high specific TSS contents was very different. The challenging of filter discussions was led by Allegra who had discussions with the ISO committee on the development of potential methods. 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.

The group mentioned the need for ring tests and it was decided to wait for BSH to come with a proposition as Germany is working on the development of a framework on this topic. Stephan Gollasch agreed to keep the group updated as soon as he has information.

5 Administrative Matters

In order to capture these new activities of the Global TestNet, the group agreed to add additional columns into the bylaws members' activity table. The new activities approved by the members should be:

- Biofouling
- Commissioning
- Compliance

The members active in these activities are requested to send a request to the secretariat to have their affiliations added into the list.

6 Elections

The group finally voted for the new 2019 Steering Committee and Secretariat with two members expressing their interest in becoming new members of the Steering Committee and two standing down. However, no members expressed interest in taking 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.

The 2019 Global TestNet steering committee is as follows:

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

The meeting thanked Stephanie Delacroix and Chris Brown for their efforts during 2018 membership of the Steering Committee.

The meeting was then adjourned.

Annex 1: Meeting Agenda

10th Global TestNet Annual Meeting Agenda

Day 1 – Thursday 14th February 2019	
09:00 – 09:30	• Registration and Introductions at the IMarEST Headquarters, London • Housekeeping rules reminder (IMarEST)
Administration - Introductions, Actions, Updates	
09:30 - 10:45	• Welcome Address - (Global TestNet Chair, Guillaume Drillet) • Introduction of participants (All) • Update - Review of 2018's Global TestNet Achievements, New Members, etc. (Guillaume Drillet & Tim Fileman) • Acceptance of the agenda + modification if required - (Tim Fileman) • Charity & IMO NGO Application – The story so far (Tim Fileman) • Summary of first Trustees meeting (Guillaume Drillet)
10:45 -11:00	Tea/Coffee Break
Harmonization - Type Approval Testing	
11:00 – 12:20	• GESAMP Update (Jan Linders) 20 mins • Correlation between DBPs and ballast water treatment: The question is whether there is a relation between the formation of DBPs in general or a specific DBP (e.g. tribromomethane - $CHBr_3$) and these or other test parameters? (Louis Peperzak) 20 mins • Chronic whole effluent toxicity testing methods. The U.S. are using methods that were designed by the U.S. EPA for determination of wastewater treatment plant effluent toxicity; a completely different operational and water quality scenario than ballast water. How do others conduct chronic WET testing during land-based and shipboard testing? Developing best practices and harmonized guidelines for chronic WET of ballast water. (Kelsey Prihoda) 20 mins • Mechanism of action for UV vs chemical treatment systems (Line Sverdrup) 20 mins
12:20 – 13:20	Lunch
13:20 – 14:10	• Methods for viability assessment (MPN & FDA/CMFDA) approved by IMO and the PSC Guidelines, regulatory update (Stephanie Delacroix) 20 mins • New method for viability assessment – MicroWise (Tim Fileman) 10min • Positioning Global TestNet: How this information should be used by Global TestNet Members? (All, 20 mins)

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Harmonization - Commissioning Testing	
14:10 – 14:50	• Commissioning tests : Update on IMO regulations (Guillaume Drillet) 20 mins • Positioning Global TestNet: what should a proper commissioning test look like (All) 20 mins
Harmonization – Experience Building Phase & Compliance Testing	
14:50 – 15:10	• Introduction to the IMO's Experience Building Phase (Teo Karayannis) 20 mins
15:10 – 15:30	• Tea/Coffee Break
15:30 – 16:30	• Sampling for compliance testing - update on both the MPN situation and compliance updates from USCG (if they are not still shutdown) (Chris Brown) 20 mins • Global TestNet role in advising on standard compliance tests. (David Wright) 20 mins • Positioning Global TestNet among the stakeholders - How to best support IMO members to assure Compliance Monitoring Enforcement is practicable? (All) 20 mins
16:30-17:00	• Any other business relevant to the day's topics (15 mins) • Summary of Day 1 (Guillaume Drillet) (15 mins)
17:00	• Day 1 adjourned (Dinner – pub/restaurant to be found)

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Day 2 – Friday 15th February 2019	
09:00 - 09:30	• **Day 2 Start** – tea/coffee, networking • **Introduction to the Day 2 Agenda** by Tim Fileman
Biofouling	
09:30 – 10:30	• **GloFouling Project Update** (IMO – John Alonso) 20 min • **AFS convention and the Biofouling Guidelines:** regulatory update/look-ahead (Teo Karayannis) 20 mins • **Overview of the anti-fouling tests NIOZ/CUW did in the NIOZ harbor.** (Louis Peperzak) 20 mins
10:30 – 11:00	**Tea/Coffee break**

11:00 -12:30	• **Bio-fouling: "In-water Hull Cleaning: local & international protection; past, present & future"** (Anna Yumnia, PML Applications) 20min
	• **Testing in-water hull cleaning systems: Introducing KOMERI's new water tank.** (KOMERI, Jaong-Kyaong Park/Hao Chul-Hoi) 20 mins
	• **Introduction to BIMCO:** (Ashok Srinivasan, Manager, Maritime Technology & Regulation, BIMOCO) 10 mins.
	• **Positioning Global TestNet:** (All) 40 min
	  ○ What lessons can we bring from ballast water testing into biofouling testing?
	  ○ How to ensure that Global TestNet can achieve its objective to act as the trusted advisor on testing Anti-Fouling Systems and In-water cleaning systems?

12:30 – 13:30	**Lunch**
Actions for 2019, Election & AoB	

13:30 – 15:10	• **Actions:** who takes leads on the different technical agendas for 2019 (all)
	  ○ Ring tests
	  ○ Global Port Water Database
	  ○ Testing guidelines for AFS and IWCS
	  ○ Filter test protocol
	• **Other Ad Hoc topics (All)**

15:10 – 15:30	**Tea/Coffee Break**
15:30 – 16:30	• **Election** of Chair, Steering Committee & Secretariat
16:30 – 17:00	• **Wrapping up and conclusions of the meeting** – lead by newly elected chair
17:00	Day 2 adjourned – End of the Global TestNet 10th Annual Meeting