

**Framework Convention
for the Protection of the Marine
Environment of the Caspian Sea**

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**CONFERENCE OF THE PARTIES
Fifth Meeting
28-30 May 2014, Ashgabat, Turkmenistan**

Items 5 and 12 of the provisional agenda

**MEETING REPORT ON THE BLACK SEA – CASPIAN SEA BALLAST WATER
MANAGEMENT ACTIVITIES**

Note by the interim Secretariat

1. Article 9 of the Framework Convention for the Protection of the Marine Environment of the Caspian Sea (Tehran Convention) calls upon the Contracting Parties “to take measures to prevent, reduce and control pollution of the Caspian Sea from vessels” and instructs them “to co-operate in the development of protocols and agreements to the Convention prescribing agreed measures, procedures and standards to that effect, taking into account relevant international standards”.
2. Article 10 of the Convention calls upon the Contracting Parties “to take all appropriate measures to prevent, (...) reduce and control pollution of the Caspian Sea caused by dumping from vessels (...)”, and to co-operate in the development of protocols to the Convention, prescribing agreed measures, procedures and standards to that effect”.
3. Article 18 of the Convention calls upon the Parties “to co-operate in formulating, elaborating and harmonizing rules, standards, recommended practices and procedures consistent with this Convention and with the account of requirements, commonly used in international practices, in order to prevent, reduce and control pollution of (...) the Caspian Sea”.
4. Following the Workshop on a Regional Strategy and Action Plan to implement the Ballast Water Management Convention and to finalize the related Regional Strategy and Action Plan (Baku, 9-11 July 2012), IMO in cooperation with the (interim) Secretariat of the Tehran Convention and the Permanent Secretariat of the Commission on the Protection of the Black Sea Against Pollution (BSC) jointly organized the Black Sea – Caspian Sea Inter-regional Ballast Water Management Activities in Novorossiysk,

Russian Federation, 9-13 December 2013, where government nominated experts from the Black Sea and Caspian Sea littoral states were invited to address and discuss the specific challenges they are facing in light of the severe impacts from harmful aquatic organisms and pathogens on these ecosystems caused by increased ship movements and ballast water exchanges between the Black Sea and Caspian Sea water basins.

5. Attached as Annex to this note is the meeting report of the second part of the ballast water management activities (12-13 December 2013) concentrating on the inter-regional challenges of the two ecosystems and including a proposal on elements for a potential inter-regional GEF project between the Black Sea and Caspian Sea regions on this issue.

6. **The Conference of the Parties may wish to:**

Support the proposal to seek GEF support for the preparation and implementation of an inter-regional Black Sea-Caspian Sea project.

ANNEX

Date: April 2014
To: The International Maritime Organization (IMO)
From: Dr. Raphaël Baumler – IMO-GloBallast Consultant
 Input from Dr. Tamara Shiganova - IMO-GloBallast Consultant

Joint Black Sea – Caspian Regional Meeting on the Harmonization of the Implementation of the Ballast Water Management (BWM) Convention

Novorossiysk 12-13 December 2013

Host: Russian Federation
Venue: Admiral Ushakov Maritime State University
Date: 12-13 December 2013
Type: Joint Black Sea – Caspian Regional Meeting
Organized by: IMO-GloBallast / UNEP / Permanent Secretariat of the Black Sea
 Commission (BSC PS) / (interim) Secretariat of the Tehran
 Convention
Supported by: UNDP

No. of participants: 35 participants
No. of facilitators: 2 lead lecturers and 7 supporters

The views expressed in this Report are those of the Consultants and cannot be attributed in any way to UNEP, UNDP, Tehran Convention (interim) Secretariat, BSC PS or IMO-GloBallast.



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1. Introduction and basics

The International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention) which aims at preventing the risks arising from the transfer of Harmful Aquatic Organisms and Pathogens (HAOP) through the control and management of ships' ballast water and sediments, is expected to enter into force soon. Therefore, State Parties and their Administrations have to be prepared to meet the requirements and obligations of the Convention. In this preparation stage, State should define the adequate national and regional strategies according to local and regional specificities.

In this context, this seminar held in Novorossiysk aimed to promote a harmonized implementation of the BWM Convention in the Ponto-Caspian region. Indeed, the specificities and vulnerabilities of this region require a dedicated approach.

Both water bodies are intrinsically dependent and related toward a man-made waterway. This connection opens the Caspian Sea to Invasive Alien Species (IAS), cryptogenic and harmful native species located in the Black Sea. Therefore, a harmonized implementation of the BWM Convention should strengthen the risks control of the biosecurity threats related to the introduction of HAOP.

This meeting proposed to highlight the relevance of cooperation between the Black Sea and the Caspian Regions. Therefore, the structure of the session was determined to meet this objective. Two sets of discussions were planned: discussions on the previous study done in the region and discussions on the opportunity to enhance cooperation.

Morning sessions were dedicated to presentations on topics related to the BWM Convention and regional specificities. Afternoon sessions were dedicated to discussions between participants facilitated by the IMO-GloBallast consultants and group work.

The ultimate aim of the meeting was to discuss the relevance and the elements to consider for the development of a joint project between the Black Sea and Caspian Regions.

A detailed programme is attached as Annex 2 of the report.

Venue

The Meeting was held at the Admiral Ushakov Maritime State University (AUMSU) located in Novorossiysk, Russian Federation.

Dates

The meeting followed a Compliance Monitoring and Enforcement (CME) course related to the enforcement of the BWM Convention that was organized from 9 to 11 December 2013. The Joint Meeting was held from 12 to 13 December 2013.

Organization

The meeting was prepared by the GEF-UNDP-IMO GloBallast Partnerships jointly with the Permanent Secretariat to the Commission on the Protection of the Black Sea Against Pollution (Black Sea Commission - BSC PS) and the UNEP Tehran Convention interim Secretariat (TCIS). In addition to the IMO, the UNEP/TCIS and the BSC PS participated in the arrangement and the facilitation of the meeting.

The host (AUMSU) supported the logistics.

The main language was English, however, simultaneous Russian interpretation was provided.

Participants

Participants of 9 countries from the Black Sea and Caspian Regions joined the meeting - Azerbaijan, Bulgaria, Islamic Republic of Iran, Kazakhstan, Romania, Russian Federation, Turkey, Turkmenistan and Ukraine. Despite being invited, Georgian representatives could not attend the meeting due to visa issues. In total, 35 participants attended the meeting.

2. Opening session of the workshop

The speech of Mr. Antoine Blonce, Technical Adviser of the IMO-GloBallast Partnerships, introduced the Workshop concerning the Joint Black Sea – Caspian Regional Meeting on the Harmonization of the Implementation of the Ballast Water Management (BWM) Convention. He welcomed the participants and acknowledged the role of the various organizations that supported the meeting and particularly the Russian Federation government and the Admiral Ushakov Maritime State University, the GEF-UNDP-IMO GloBallast Partnerships Programme, the Black Sea Commission and the United Nations Environment Programme (UNEP) through the Interim Secretariat of the Teheran Convention.

Then, Mr. Mahir Aliyev, Regional Coordinator for Europe of the UNEP, formally opened the Workshop. He welcomed the delegates of both regions. He expressed his contentment to see the Black Sea and Caspian delegates in the same location for the first time. He highlighted the importance of regional cooperation for the UNEP. He recalled that the present meeting focused on the BWM Convention. He thanked the Russian Federation and Admiral Ushakov Maritime State University for hosting the meeting and for their hospitality. He reminded about the key position of the Russian Federation, which unites both basins. He also acknowledged the involvement of other intergovernmental bodies. Finally, he wished a successful and fruitful meeting.

Ms. Iryna Makarenko, Administrative Assistant of the Black Sea Commission Permanent Secretariat, thanked the host as well as the IMO. She reminded the importance of regional cooperation for a successful implementation of the BWM Convention and recalled that such meetings are particularly helpful to identify regional needs.

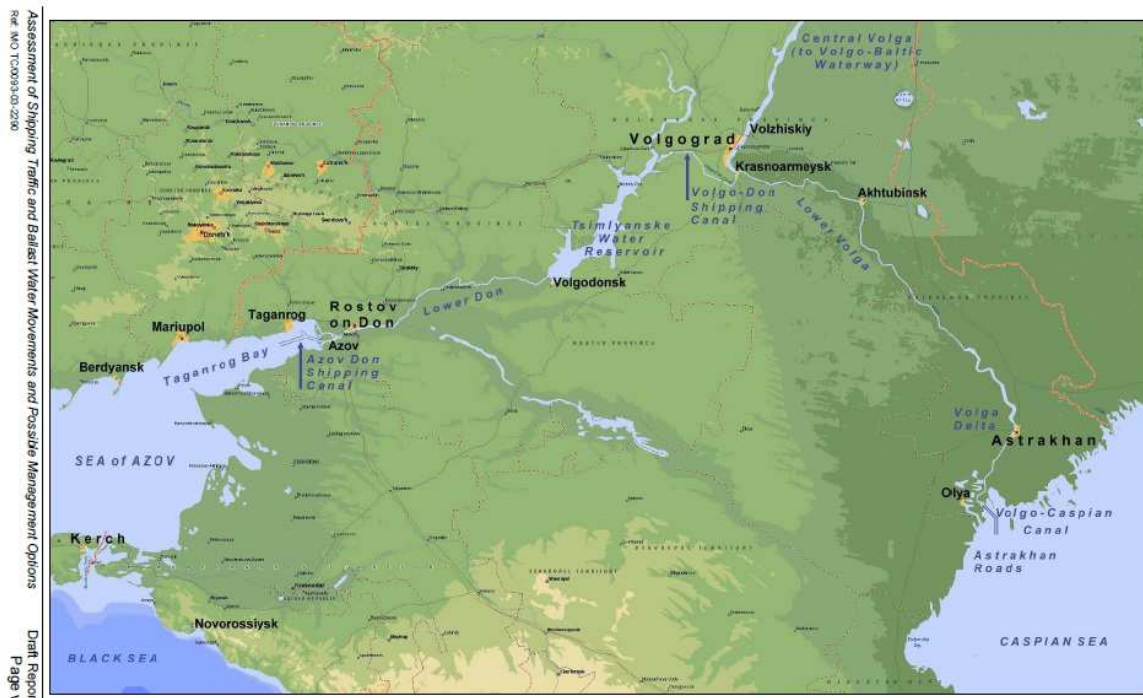
Opening remarks are attached as Annex 3 of the report.

After this introduction, Mr. Blonce presented Dr. Tamara Shiganova who began the first working session of the meeting.

3. Day one: review of the Study and update on the IAS issues

3.1. Morning- Presentations on the review of the 2006-Study

The objectives of the morning were to introduce the review of the *2006-Study on ship-borne transfer of invasive species to and from the Caspian Sea* and to update it. Two presenters shared the session. The first speaker introduced the relation between both water basins and the issues related to the introduction of non-native species in the region. The second speaker focused his presentation on the shipping trends as well as the present onboard Ballast Water Management Systems (BWMS) and shore-based facility principles.



3.2. Session one: Regional update and study review - past and present situation of IAS in the region

Presentation and discussion lead by Dr. Tamara Shiganova. The Objectives of the presentation were to:

- Introduce the geomorphological and hydrological condition of the Ponto-Caspian water system and highlight their similarities;
- Review the issues related to Invasive Alien Species in the Black Sea, the Sea of Azov and the Caspian Sea;

- Describe the present researches on the topic; and
- Focus on the *Mnemiopsis leidyi*: impacts on local ecosystems and human activities / spread control possibilities with the *Beroe ovate*.

First part of the presentation

Dr. Shiganova, senior researcher from the P.P. Shirshov Institute of Oceanology - Russian Academy of Science, showed in her first presentation the relationship between the Black Sea and the Caspian Regions. She demonstrated that both water basins share geomorphological and hydrological similarities (salinity, temperature, productivity), which make them prone to mutual invasions particularly since the man-made creation of the Volga-Don waterway. In addition, she emphasized that the Black Sea serves as a recipient and donor region of species because this sea is well connected to the world trade and subjected to numerous invasion due to its inherent eco-systemic vulnerabilities.

During her historical presentation of invasive species in the Black Sea, she showed that organisms arrived from the different donor areas, mainly from the temperate waters of northern America and Europe and recently after an increase of the water temperature, the species' arrival increased from the Mediterranean Sea, some of those species first concentrate in the near Bosphorus area then could spread around the Black Sea in accordance to their tolerance to the conditions of the Black Sea. The most of temperate species established in the Black Sea, creating populations and then spread in the Sea of Azov and some of them were brought with the ships in the Caspian Sea with fouling communities and with ballast waters after ballast tank construction via the Volga-Don waterway.

Then, she introduced the present evolutions in the Sea of Azov, which connects the Black Sea to the Don River. The opening of the Don-Volga canal and regulation of Don river run-off affect the ecosystem of this sea and modifies some of its physical conditions (e.g. salinity). She highlighted that most of the non-native species in this sea originates from the Black Sea (70%) and Volga Basin (12%).

Thereafter, she presented the processes generating Caspian Sea invasions. The intentional introduction of fish for farming and deliberate stocking of commercial fish and food organisms constituted the first stage of arrival of Alien species in the Caspian Sea. Second pathway for invasions was identified as the connection of the Black Sea and Caspian in 1952, which created an open door between both water basins and species with fouling communities have been brought in the Caspian. Among them were zoobentic species and macrophytes. The third process after 1980 relates to the release of large amount of ballast water carried by ships and particularly those arriving from the canal. This ultimate process of invasion brings numerous species and particularly planktonic species, which seriously impact the Caspian Sea ecosystem.

She highlighted that 85% of the non-native species introduced in Caspian Sea are present in the Black Sea. In addition, she showed that the rate of invasion steadily increase in the Ponto-Caspian area.

Before presenting the main Invasive Alien Species located in the region, Dr. Shiganova reminded that non-native species become invasive in certain conditions:

The most of these successful invaders have physiological features that favored their establishment such as a wide food spectrum, high fecundity, hermaphroditism (barnacles *Balanus eburneus*, *B. improvisus*; shipworm *Teledo navalis*; comb-jellies *M. leidy* and *B. ovata*), and in some cases the ability to self-fertilize (*B. improvisus*, *T. navalis*, *M. leidy*, *B. ovata*). Many non-native species also have abilities to survive in unfavorable conditions, for example, by decreasing level of metabolism, reducing movements, and stop feeding (*M. leidy*, *B. ovata*); producing resting eggs (copepod *A. tonsa*); by creation cysts (some algae); by rapid growth to maturity and reproducing quickly after hatching (within two weeks: *M. leidy*, *B. ovata*; within one month: *B. eburneus*, *B. improvisus*).

The most destructive IAS identified in both regions is the comb-jelly *Mnemiopsis leidy* (*M.leidy*), which caused extensive damages to ecosystems and human activities. Dr. Shiganova considers this gelatinous species as an aggressive and highly adaptive predator. DNA analysis showed that *M.leidy* originated from North America. After invading Ponto-Caspian region, the *M.leidy* continues its dissemination across European waters and has been identified in Mediterranean Sea, along Atlantic coast and in northern European regions.

After a short presentation on *M.leidy*, Dr. Shiganova introduced her studies on the *Beroe ovata* which possesses the particularity to control the *Mnemiopsis leidy* seemingly without causing collateral damage to local ecosystem. From this part of the presentation emerged some discussion on the possibility to introduce the *Beroe ovata* in the Caspian Sea as predator that may control *M.leidy* population, as showed the example of the Black Sea when *B.ovata* with ballast water was introduced in the Black Sea. It was recalled that such a discussion must be debated among the Tehran Convention partners with an extensive scientific support.

Dr. Shiganova also presented the cases of the *Acartia tonsa*, *Balanus improvises*, *Rapana venosa* before reminding to the participants that the shipping growth through the northern route (from Caspian Sea to Baltic Sea) presents new routes for invasions. The mention of Northern route risks underlines the importance to enhance cooperation with regions, which can affect or be affected by the Caspian Sea and its connecting waterways.

Dr. Shiganova concluded her presentation with three remarks:

1. In the latter half of the XX century, increased shipping and construction of canals caused the Black Sea to become a recipient and donor area for marine and brackish water species. It serves as a hub for species that then spread further to the Sea of Azov and the Caspian Sea, and also south to the Sea of Marmara and in some cases to the Mediterranean Sea. These processes led to biotic homogenization of all the Ponto-Caspian Seas, as the same non-native species became dominant numerically in communities and often in ecosystem functioning while native biodiversity decreased;

2. Rate of invasions accelerated during the last 50 years because of the generalization of ships using ballast tanks in the 1980s and caused anthropogenic and climatic shifts of ecosystems; and

3. It is evident that the widely cited theory that a species-rich marine basin is less subject to being invaded than a species-poor one with many empty niches is not confirmed in the case of the inland southern Eurasian seas. On the contrary, in these marine basins the number of non-native species established is proportional to the number of native species.

At the end of this first presentation, Dr. Shiganova clarified the impact of the *Mnemiopsis leidyi* on the Kilka Fish (the most valuable Anchovy Kilka and Big-eye Kilka). Her comments on this fish made a transition to her next presentation, which summarized the outcomes of the research programmes in the region.

Second part of the presentation

She introduced her second presentation by describing the various steps of invasions and their related mitigation measures:

- prevention (e.g. risk assessment);
- eradication/containment (i.e. protective measures against invasion); and
- control & restoration (i.e. repair the aftermath).

Then, she later presented some monitoring and IAS control programmes in the Caspian Sea, developed by the Russian Federation and the Caspian Environment Programme.

Monitoring programmes verify, quantify and assess pests in order to develop adequate strategies and implement control measures. The monitoring also supports identification of vulnerable areas and establishment of lists of non-native and harmful species. IAS management strategies include preventive measures as well as mitigation, protection, eradication and containment measures.

Numerous data have to be collected to make an inventory of non-native and invasive species. In addition, the inventory also aims to determine the impacts of each species and to develop adequate control measures and identify their pathways to better prevent and control introductions.

In the last part of the presentation, Dr. Shiganova presented the objectives and outcomes of the Caspian Environment Programme (Caspeco Project):

- To assess vectors, pathways of invasive species introduction; their composition and role in the Caspian ecosystem;
- To analyze seasonal and inter-annual dynamics of the most aggressive invader *Mnemiopsis leidyi* population in all areas of the Caspian Sea; its impact on the Caspian ecosystem;
- To prepare recommendations for follow up actions on invasive species management:

- for protection and control of the Caspian Sea from any sources of accidental alien species introduction;
- on possibility of biological control of *M.leidy*.

Third part of the presentation

Focused on the *M. leidy*, the last part of the presentation highlighted:

- The seasonal development and geographic dissemination of the gelatinous species;
- Its impacts of the emblematic Kilka fish; and
- The role of *Beroe ovata* to control *M.Leidy*.

Present researches show that there is no stabilization in the population of *M.Leidy*. Since its abundance declined in 2003-2005, due to cold winters and lower average annual temperatures, the *M.leidy* expanded “in the northern direction and its summer abundance and biomass have raised in the Middle and Northern Caspian, which are the main areas of distribution of the most valuable commercial fish and seal”.

Later, Dr. Shiganova presented the impacts of *M. leidy* on the emblematic Caspian fish: the Kilka. While the total catch of Kilka seriously dropped since the *M.Leidy* invasion, Dr. Shiganova described in details a collateral consequence of the invasion: the modification of the Kilka fish distribution in the Caspian Sea. In short, the common Kilka benefits from the massive decay of the other types of Kilka and particularly of Anchovy and Big-eye Kilka.

Finally, Dr. Shiganova presented the *Mnemiopsis leidy* 's predator: the *Beroe ovata*. She stressed the efficiency of this highly specialized carnivore of plankton-eating ctenophores in controlling the development and spread of the *M.l eidy*. She also showed through the outcome of her research that the *Beroe ovata* does not seem to have impacts on other species.

“The species of *Beroe ovata* has two outstanding advantages: it is highly specific in its feeding, so that even their larval stage feeds on larvae of *M.leidy*. Secondary, its reproductive rate, fecundity growth rate and time of maturity are as great as that of *M. leidy*, so that its population can grow at similar rates to its prey (Shiganova et al, 2004)”

She concluded her presentation by supporting the implementation of the BWM Convention in both regions in order to develop preventive measures against all IAS brought by ballast water. And finally she reminded that the Tehran Convention constitutes a good framework to coordinate the work against the *M. Leidy* and she proposed that the *Beroe ovata* could be a seemingly harmless natural tool to control the *Mnemiopsis leidy* invasion.

After a short break, Dr. Raphaël Baumler, IMO-Globalist Consultant, presented the next presentation on the shipping characteristics in the region.

3.3. Session two: Fleet movement between the Black Sea and Caspian Regions and limitations to certain ships in complying with the BWM Convention

The presentation and discussion were led by Dr. Raphaël Baumler. The objectives of the presentation were to:

- Review and underline the main outcomes of the 2006 study;
- Present the link between shipping features and fleet with the origin and volumes of ballast water released particularly in the Caspian Sea; and
- Shortly introduce the existing BWM systems on board ships and discuss the relevance of a shore-based facility in the Black Sea and Caspian context.

First part of the presentation

The presentation reviewed the shipping related elements of the Study on ship-borne transfer of invasive species to and from the Caspian Sea.

Dr. Baumler recalled that the opening of the Volga-Don waterway enhanced the integration of the Caspian Region in the world trade. Being an enclosed water body, the Caspian Region was virtually opened to the globalization processes, which provided new opportunities for the neighboring countries in terms of exports and imports.

Numerous ships cross the area to support new trade patterns and growing trade volume. Consequently, the region sustains shipping externalities. In this respect, the transfer of HAOP through ballast water represents one of those negative externalities, which has not been completely addressed yet.

Firstly, the BWM Convention has not entered into force yet and secondly the present fleet operating in the area was built at a time when invasive species were not considered in shipbuilding. The fleet was optimized to operate in the region (size, technology) and to carry cargo with efficiency. Unfortunately, environmental issues as transfer of HAOP were not part of this optimization process. Therefore, Dr. Baumler highlighted that the present fleet conditions unease the implementation of the BWM Convention, and the region may require a dedicated approach.

Because of these conditions, locations, and amount of ballast water discharges depend on traffic patterns and ship type; it is paramount to collect data concerning the ballast water transiting in order to identify the vulnerabilities and to develop counter-measures.

The Caspian exports Oil and Metal scrap. Therefore, a large number of ships in transit are tankers (50%) or dry bulk. These ships arrive “in ballast” in the Caspian Sea and discharge their ballast water while loading their cargo.

To summarize the shipping trends, the 2006 Study demonstrated that the overwhelming majority (85%) of the ballast water transiting in the area arrives in the Caspian Sea. In addition, 95% of this ballast water originated or transited in the

Black Sea. Dr. Baumler reminded that the Black Sea water causes a very high risk because of its similarities with the Caspian Sea conditions.

In short, IAS are an established threat for regional ecosystems and ballast water control is a must for the region because:

- The Caspian Region is highly vulnerable (particularly to Black Sea & Sea of Azov species);
- The risk of invasion is high since the opening of the Black Sea and Caspian connection and the growing flows of trade;
- Ships constitute a major vector of Alien Species (ballast water & Biofouling);
- Present fleet was not designed to manage ballast water and control HAOP; and
- Most of the ballast water released in the Caspian Sea originates from or transits through the Black Sea.

Second part of the presentation

The second part of the presentation focused on the BWM techniques and particularly on the D-2 standard. Dr. Baumler reminded that D-2 standards set Goals to reach for the ships and system manufacturers. The equipment designed to reach D-2 standards must achieve “biological effectiveness” (G-5) and “[...] must be safe in terms of the ship, its equipment, and the crew.” (G-8)

Consequently, D-2 standards are demanding for ships because of onboard limitations (available space, power, piping, etc.) and variability of external conditions (water salinity, temperature, etc.) the ship may encounter.

33 BWM systems have been type approved (May 2013) and several are under testing or approval process. However, none reaches the double G8/USCG-ETV certification for the time being.

Thereafter, Dr. Baumler presented the tendencies in BWM system. He focused on the drawbacks and advantages of the most common systems: filtering, UV systems, electrolyze. To complete this part of the presentation, Dr. Baumler highlighted the main factors influencing the treatment efficiency:

- Temperature;
- Salinity;
- Turbidity;
- UV-Transmittance;
- Total Suspended Solids (TSS);
- Dissolved Organic Carbon (DOC);
- Particulate Organic Carbon (POC); and
- Organic Material Concentration.

Third part of the presentation

In the final part of his presentation, Dr. Baumler recalled the importance to develop ballast water strategies according to regional contexts. In this respect, the Caspian Sea and the Black Sea could benefit from their geographic uniqueness to develop a

tailor-made solution to maximize BWM efficiency and minimize implementation expenses.

The speaker highlighted that both the Black Sea and Caspian Regions share physical, biological and geographical similarities. An important geographical similarity of both water basins is the narrowness of the entrances passages, which makes them easy to control:

- The Black Sea opens to the Mediterranean Sea via two narrow doors. Bosphorus and Dardanelle straits concentrate all the shipping traffic entering and leaving the Black Sea.
- The Volga-Don lock system forms a set of man-made gates connecting the Black Sea and the Caspian Sea. The locks are gates under human control. Therefore, ships transiting between the Black Sea and the Caspian Sea depend on the properties of these gates and have to adapt. Therefore, such locations could host shore-based systems. In short, **supported by a shore-based system and appropriate control system, locks may restore the Black Sea and Caspian's natural isolation without compromising marine trade.**

The implementation of such shore-based BWM system in the Volga-Don waterway was supported and considered as the best option in the 2006 study.

The advantages of such installation in the context of the Volga-Don waterway are:

- Locks and canal create easy and controllable entry/exit points;
- Strict control of ships and BWM option available;
- Restore natural barriers (at least for ballast water risk);
- Continuous assessment and review of BWM system efficiency;
- Trained and dedicated staff to manage BWM systems and control ships;
- No space nor power limitations unlike ships;
- One single investment/location – pay-back period to determine;
- Control point can also provide portable devices between locks – e.g. Chlorine distributor.

This shore-based solution has several drawbacks:

- Ships operating outside the region still need to be equipped;
- Installation cost / space & land required / location and fittings (berth, barge, piping, power, etc.);
- Safety devices to avoid contamination;
- Ballast water delivery and upload rates;
- Economic and technical impacts for ships and shipowners who need to install adaptors (cost / time / retrofitting);
- Seasonal traffic (avoid queuing).

Because the Black Sea and Caspian share geographical, physical and ecosystem similarities, they are vulnerable to the same hazards. Therefore, these regions have to work closely together.

In conclusion, Dr. Baumler recalled that the regional specificities (controllable access to both water basins through narrow passages) should drive the determination of an integrated BWM strategy. In this respect, the narrow accesses to both water basins may constitute an opportunity to develop and establish an efficient BWM control system.

Presentation on Novorossiysk research project

Before the next session, Ms. Selifonova, senior researcher at the Admiral Ushakov State Maritime University, presented her work in Novorossiysk waters on IAS and ballast water.

The monitoring of invasive species in the port of Novorossiysk began in 2004 and constitutes the most advanced port monitoring study in the Russian Federation. Offshore testing and regular monitoring of the same locations are organized to assess the evolution of species distribution. According to the research, most of the ballast water discharged in Novorossiysk originates from the Black Sea and the Mediterranean. The monitoring integrates a sampling programme on ships followed by species taxonomy.

Novorossiysk presents a high level of non-native species, 66 of them were found during the monitoring programme. In conclusion, the researcher emphasized the need to reduce obstacles to ships access for scientific purposes.

3.4. Afternoon – Countries presentation and discussion on the issue and needs related to the BWMC and IAS

The aim of this session was to review the needs of the countries. Each country had to reply several questions and identified the weaknesses in the implementation process.

3.5. Session three: Update and plenary discussion on present developments by countries in the Black Sea and Caspian Regions

The discussions were facilitated by Dr. Raphaël Baumler. The objectives of the session were to:

- Identify the needs of each country;
- Discuss the specific challenges that the countries in the region may face;
- Review the areas requiring regional cooperation and support.

This session left the floor to the countries. Its purpose was to discuss the issues related to IAS after the short review performed during the morning session. Each country representative briefly presented the issue related to its national situation and highlighted some needs as well as areas to promote the issue at the regional level:

Azerbaijan:

- Reports on IAS exist in the country

- Ratification of the BWM Convention is under discussion but several challenges exist
- The maritime administration is interested in the ratification and supports capacity building
- Because ballast water exchange cannot be a solution in the Caspian, the best identified solution is to comply with D-2 Standards
- The installation of BWM Systems on board ships remain an issue for national fleet which is most composed of old ships inside which such systems may be difficult and costly to install
- Study of the economic consequences of the ratification should be considered
- The development of new pipelines reduces the use of tankers
- Assistance from the Tehran Convention (interim) Secretariat and the IMO are welcomed
- The development of a common risk assessment and exemption regime could initiate regional cooperation

Bulgaria:

- The development of a risk assessment regime in the Black Sea could join the development of such a tool in the Caspian Sea
- Bulgaria has specific commitment because the country is integrated in the Paris MoU
- The identification of the organization in charge of inspections has to be solved
- PSCO need training on the Convention and even may not be qualified to take samples
- No National Task Force (NTF) on ballast water in the country
- Lack of information and awareness on the topic
- Consider the ratification with reservation like Sweden did
- D-2 Standards are considered as the next target. All ships in the region should be equipped with BWM systems
- Is there enough data in the region? The dynamics of species should be monitored

Islamic Republic of Iran:

- Baseline survey expertise is available
- A National Steering Committee serves as a NTF dealing with the issue and is particularly involved in the fight against *M.leidy*
- Oceanographic vessel support research programmes

- Data base under development by research institute to develop risk assessment tools
- Guidelines are developed by the Ministry of Environment
- A Ballast Water Reporting Form (BWRF) is available but on a voluntary basis
- Guidelines for the PSC need final approval
- Work with other MoU can be helpful
- I.R. Iran is conducting special actions to introduce *Beroe ovata* to control *M.leidy* in its waters
- Difficulties in sharing data at national level, problem in flow of information
- Need for a regional MoU covering the Caspian Sea
- Many old and small ships sail in the region
- How to manage emergencies at a regional level
- Black Sea and Caspian Sea possess a natural link

Romania:

- Wait for final ratification
- No ballast water sampling programme / no monitoring study
- No risk assessment
- The creation of a NTF should include other ministries as well as numerous stakeholders
- No national project, expect EMSA support
- No BWRF available / No requirements in ports

Russian Federation:

- Since 2012, the Russian Federation is a party to the BWM Convention
- A National Strategy has been developed to support the implementation of the Convention. This strategy clarifies the roles and liabilities of each partner
- A programme of data collection has been launched
- For the time being, ballast water exchange is deemed acceptable in the Black Sea
- Ships are required to submit BWRF before entering ports. The RF uses the IMO BWRF
- PSCO may test ballast water salinity. If the sample does not meet the requirement, the ship is required to exchange its ballast water or cannot complete its full loading

- In case of violation, port authority prohibit ballast water discharge and send the vessel away for ballast water exchange
- 100% of ships are checked and 70% controlled by PSCO

Turkey:

- After serious invasions, Turkey initiated stringent ballast water control policy and research programme
- Tubitak developed a geographical information system but only available in Turkish. Thousands of ports are recorded which constitute the basis for pre-arrival risk assessment of ships in Turkish ports

Turkmenistan:

- Various institute monitor the ports and coastal areas
- Because the issue of IAS is a regional one, the country aims to ratify the Convention
- The ports must be upgraded and the fleet renewed progressively to meet the requirements of the BWM Convention. Ship building bases are required to upgrade ships
- Risk evaluation and risk assessment to issue exemption have to be considered

Ukraine:

- Various institutes are involved in port monitoring
- The monitoring is continuous
- National legislation to implement the BWM Convention is ready but not yet ratified
- The implementation should not be an issue in Ukraine because the issue is already under scrutiny
- Certification and analysis protocols have to be determined
- The issue of sediment management / acceptance in ports have to be reviewed
- Difficulties in managing ballast water onboard ships should not be omitted or neglected
- Onshore facility should be supported by international funds

Here is a summary of all the national presentations, compiled by themes by the IMO-GloBallast consultant:

Research support:

Baseline study, port monitoring and onboard ballast water sampling should be promoted. Countries having on-going programmes are invited to share their data and experience with neighboring countries. Countries and locations without proper research programmes should launch research projects in order to assess the environment and the impacts of shipping on coastal areas. Data collection should be continuous in order to consider the dynamics of species and the modifications in their distribution. Port authorities and maritime administration should promote research and suppress inadequate obstacles to scientists. In addition, the mitigation methods to control invasive species should be assessed regionally. For example, the question of the introduction of the *Beroe ovata* in the Caspian Sea to control *Mnemiopsis leidyi* has to be rapidly solved by scientists and administrations of the Caspian Sea region with the support of the Black Sea where this introduction already occurred.

Shipping and fleet:

The evolution of shipping in the region has to be considered. The installation of pipelines tends to modify the present shipping movements. The implementation of Ballast Water Reporting Form (BWRF) in all countries should be fostered to enhance shipping and ballast water discharge data reliability. In addition, the BWRF supports the risk assessment of ballast water to be discharged in the port. The fleet quality is another issue to consider when implementing the Convention requirements. The Caspian Sea fleet is old and mostly unsuitable to integrate BWMS onboard. A clear distinction between local shipping and international shipping should be established during the development of the Convention requirements in the region.

Risk assessment and exemption:

Several countries have highlighted the need to develop a regional risk assessment tool in order to assess the arriving ships and to issue exemption certificates. To promote such tools, knowledge and data sharing are paramount among the regions. Some countries already possess large amount of data and software but are presently unfortunately unable to share them because of language barriers. These difficulties of knowledge sharing and language have to be overcome through an appropriate regional cooperation. The countries hosting information centers and risk assessment software developers are encouraged to grant data access to neighboring countries.

Emergency management and contingency planning:

One country raised the issue of the development of a regional emergency management and contingency plan. It is obvious that in the Caspian Sea as well as in the Black Sea, regional plans are a must. So, the development of cooperation in this domain should be initiated soonest by listing, detailing and harmonizing national response systems.

National Task Force and awareness:

The countries possessing NTF, committees or national strategies developed adequate awareness campaigns. So, in these countries numerous stakeholders promote and support national strategies. On the other hand, the countries without NTF suffer a serious lack of information on the topic and the awareness level remains low.

Port State Control issues:

The development of a regional cooperation on PSC guidelines and eventually a Caspian Sea MoU should be areas of cooperation. In addition, PSC cooperation should also encompass the experiences of other MoUs. In this respect, some countries of the region belong to several MoUs and could support the development of regional guidelines. In addition, the countries with extensive PSC experience should support capacity building in the region through bilateral or regional cooperation. The clear definition of the inspection regime should be established in each country. The issues related to sampling should be clarified. The institutes able to conduct detail sampling and analysis have to be nationally and regionally determined.

Sediments management:

In addition to international guidance, the management of sediments have to be considered nationally or regionally.

Onshore facility to manage ballast water:

Feasibility studies for the installation of shore-based system should be launched. In addition, the funding of such system could be international.

3.6. Session four: Presentation on the establishment of a new project to enhance the Black Sea and Caspian Regions cooperation

The presentations and discussions were led by Mr. Mahir Aliyev and Dr. Yegor Volovik. The objectives of the discussion were to:

- Debate the relevance of strengthening the relationships between the Black Sea and the Caspian Regions; and
- Develop a joint project to strengthen regional cooperation.

Mr. Mahir Aliyev introduced Dr. Yegor Volovik, UNEP-Consultant in charge of developing a joint Black Sea and Caspian Regions cooperation project.

Dr. Volovik highlighted that one of the expected outcome of the present session was to determine the relevance to launch a joint project on the topic of IAS control in the Ponto-Caspian region. He recognized that such project might be difficult to develop because in addition to the number of countries, many ministries are not used to working together.

He recalled that both regions are united through the Volga-Don canal and share numerous similarities and concerns. In addition, he recalled the key position of the

Russian Federation, which links both water basins. In this context, a joint project has its relevance in “hot spot” areas.

He mentioned that the participants have to share their thoughts about the development of such an idea because the framework of the project as well as its form should be defined in this unique meeting gathering countries from both regions. The means, objectives, organization, structure and forms of cooperation should be considered – e.g. group work or permanent secretariat.

Dr. Volovik recommended the participants to identify the areas of collaboration as well as to propose their specific ideas or projects. For example, research on a technological solution to create an onshore facility may be discussed through the joint project.

After this short presentation, several countries supported the idea and shared some proposals and remarks:

- **Turkmenistan** supports knowledge sharing between both regions;
- **The Russian Federation** recalled that enhanced European cooperation is a successful way to reduce environmental footprint of transport systems;
- **The Islamic Republic of Iran** informed that such project could help to update the national laws. In addition, the delegate expressed its interest to benefit from other countries’ experience through data exchange programmes. Finally, he proposed that several guidelines should be developed at the regional level.

These discussions closed the first day.

Dr. Baumler shortly presented the content of the second day. After morning presentations, the next afternoon is dedicated, first, to group discussions on the 2012 strategy and action plan developed, and, second, to discussions on the creation of a possible joint project.

4. Day two: Risk management and biosecurity principles, risk assessment and contingency plan, action plan review and joint project discussion

4.1. Morning: Risk management and biosecurity principles, risk assessment and contingency plan

The goals of this morning session were to:

- Enlighten the participants with important dimensions of BWM;
- Present them with a framework of analysis and demonstrate that biosecurity measures already exist in shipping;
- Discuss the risk-based exemption regime as per the Convention and the BWRP as a risk assessment tool; and

- Introduce alternatives to shipboard systems, particularly in the context of contingency.

4.2. Session one: Risk management principles and biosecurity approach

The presentations were done by Dr. Raphaël Baumler, IMO-GloBallast consultant. The objectives of the presentations were to:

- Identify risk management principles and relate them to BWM Convention;
- Introduce biosecurity approach and its relevance in shipping; and
- Discuss the relevance of a comprehensive biosecurity policy.

Before discussing each notion, Dr. Baumler highlighted the link between them by recalling that biosecurity is a strategic approach driving policies aiming to control biological threat and using risk management techniques.

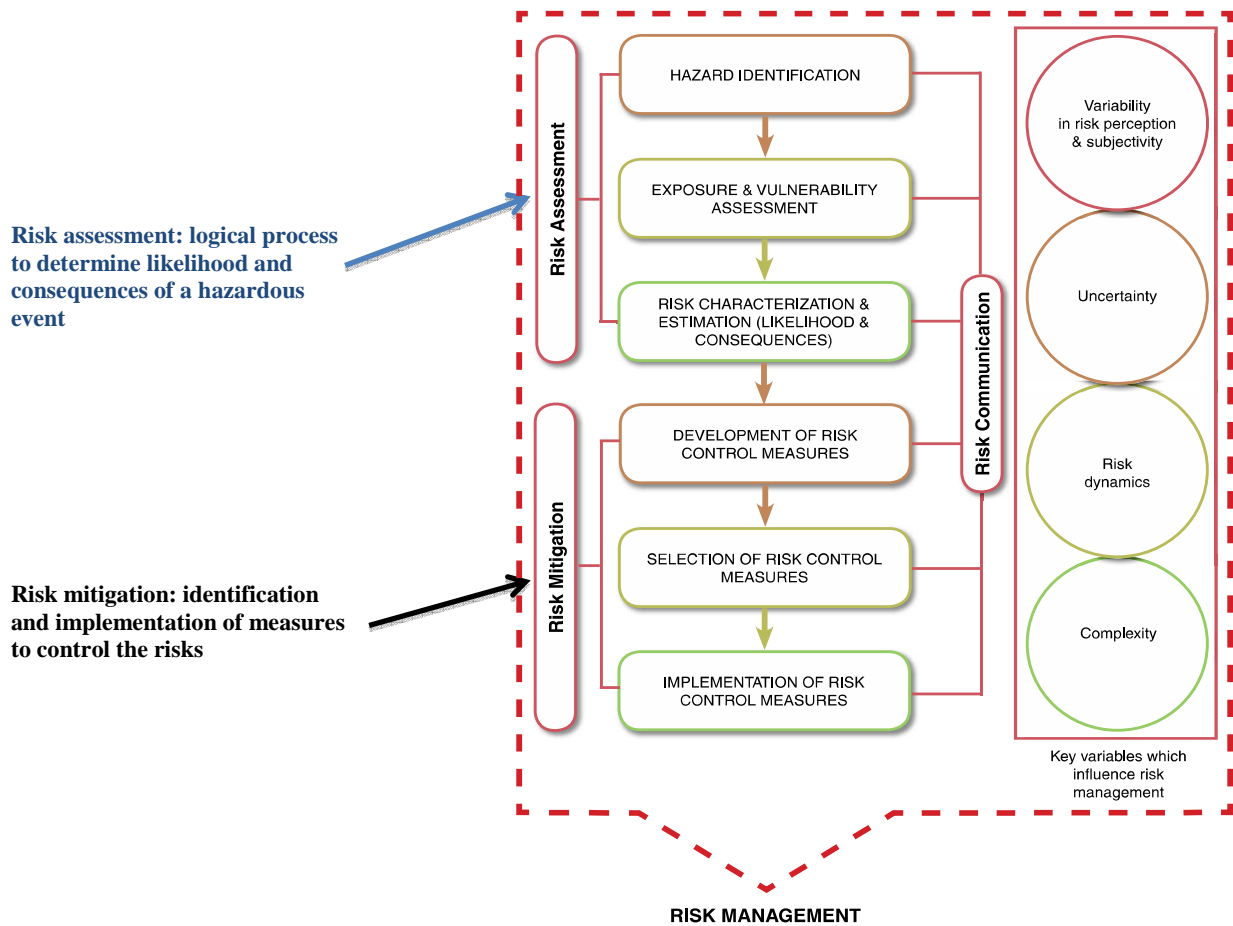
First part of the presentation

It is important to differentiate risk eradication and risk management. In the context of BWM, the impossibility to suppress ballast water on board existing fleet hinders risk eradication. Therefore, because the present fleet has to be operated with ballast water, the control strategy aims to manage the risks to keep it at tolerable levels. These acceptable or conventional levels are defined in D-1 and more precisely in D-2 standards of the Convention.

Risk management approach in the context of the BWM Convention should consider the following elements:

- Find effective measures to contain hazard (i.e. BWM techniques complying with regulations);
- Reduce to an acceptable level the HAOP risks (i.e. standards defined in the Convention);
- Assess the risks related to each system – ecosystem & shipping (e.g. precaution during the development of BWMS through G8 & G9 in order to ensure biological effectiveness and ship safety);
- Develop control measures – FSI & PSC (i.e. art. 9 & 10 and related regulations);
- Develop protective measures – adequate facilities, contingency plan and emergency procedures.

After recalling these principles, Dr. Baumler discussed the risk approach as defined in the IMO-GloBallast Monograph number 21:



Then, the presentation placed the risk management principles in the context of the BWM Convention and the administrative control through the roles of the Flag/Coastal/Port State responsibilities.

Second part of the presentation

The second part of this presentation aimed to introduce the concept of Biosecurity and to discuss it in the context of the BWM Convention. The UN bodies and particularly the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) now broadly use this concept. It means that most of the

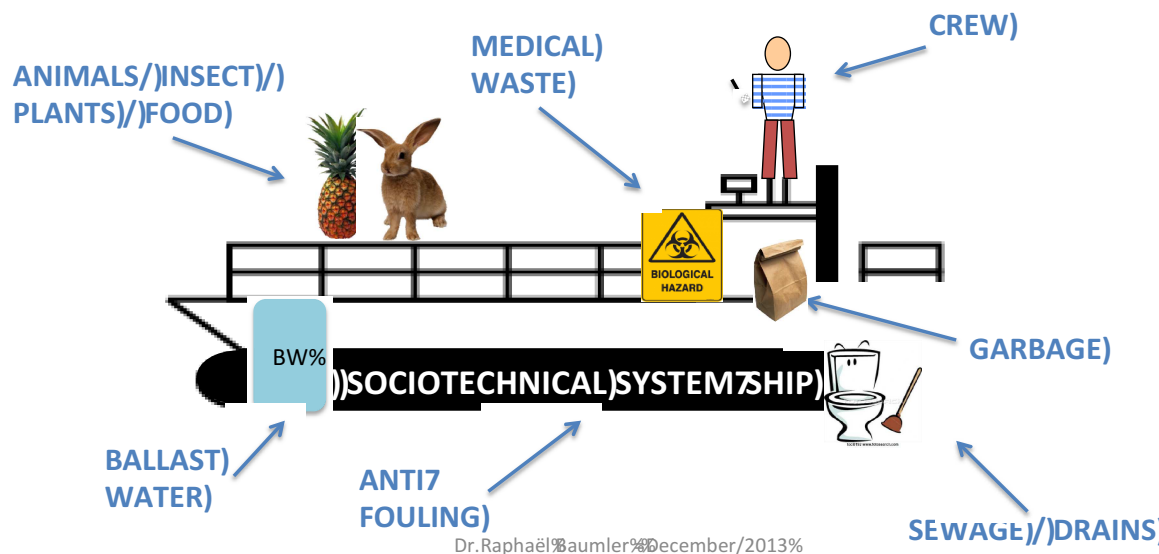
countries already possess legislation related to this issue, but often those regulations are disseminated among various administrations (e.g. health department, food and agriculture, sanitary, defense, transport, customs, etc.).

The main idea behind the introduction of this notion is to promote discussions among administrations using the biosecurity approach as a common ground.

In this respect, the presentation recalled that two types of biosecurity policy exist. The traditional policy spreads biosecurity duties among various departments and ministries; while the integrated approach aims to build up a unified force aiming to address all the dimensions of biosecurity. Both policy approaches possess their relevance as long as they are coordinated and determined to cope with the national structures.

After introducing these approaches, Dr. Baumler highlighted the usefulness of biosecurity in the context of the BWM Convention by presenting its practice, which integrates three steps: pre-entry, entry and post-entry policy and controls.

Biosecurity related policies have an old history in shipping. These policies and related controls address various aspects of the ship's biological threat.



The health department, through the quarantine office, often controls ships on arrival and verifies the harmlessness of most of the pathways previously identified on ships (e.g. seafarer's health, animal and insects, plants, medical wastes, garbage, sewage – traditional biological risks). To broaden the context of biological threats, ballast water and bio-fouling represent the latest biological risks conveyed by ships.

To assess and control traditional biological risk of each vessel, a three-stage policy has been implemented in each port:

- Before arrival, the ships send a quarantine message detailing crew health and other related information. This message serves as a risk assessment tool for the quarantine officers to identify the high-risk ships prior to their arrival.
- On arrival, ships hoist the Q-Flag (i.e. representing Quarantine) and health department and/or quarantine inspect the ships.
- As post control operation, and as per WHO requirements, each country possesses health-monitoring systems in place to track and control outbreaks.

In short, control techniques covering pre-arrival, on arrival and post arrival of ships already exist. However, most of the control regimes in place focus on traditional biological risks (crew, animals, plants, etc.) but do not encompass ballast water risks despite the integration of ballast water in the “International Health Regulation handbook for inspection of ships and issuance of ship sanitation certificates” made by the WHO in 2005.

In conclusion, the instances able to assess biological threats in shipping already exist but they need to incorporate additional biosecurity issues – i.e. ballast water, sediments and bio-fouling, and distribute them among the appropriate control agencies.

4.3. Session two: Risk assessment - Exemption and BWRF

This presentation was done by Dr. Raphaël Baumler. The objectives of the presentation were to:

- Present the notion of risk assessment;
- Introduce the notion of risk assessment in the context of exemption as per regulation A-4; and
- Discuss the BWRF as a risk assessment tool.

The need for risk assessment is either explicitly required by the BWM Convention, for example prior to the granting of exemptions, or implied in the light of the Convention requirements. The risk assessment initiates processes, which aims to define risk acceptability and triggers adequate measures. The risk assessment technique provides scientific support to make informed decisions in order to mitigate the risks with efficiency in limited resource environments.

The risk assessment techniques tend to identify and evaluate hazards related to particular situations or states. Quantitative and/or qualitative evaluation techniques both exist and can be mixed to enhance assessment accuracy.

After this short introduction, Dr. Baumler axed the presentation on two elements related to the topic: the risk-based exemption regime and the Ballast Water Reporting Form (BWRF).

First part of the presentation

The risk-based exemption regime is a requirement of the BWM Convention. Regulation A-4 recalls that an exemption can only be “granted based in the

guidelines on risk assessment developed by the Organization.” Before discussing the methods introduced in the guideline G7, the rationale and principles of exemption were shortly introduced.

To comply with G7, the risk assessment process has to:

- Collect and gather “best available scientific data”;
- Use qualitative and/or quantitative analysis;
- Remain under permanent review and improvement;
- Reach a sufficient level of effectiveness in order to achieve an appropriate level of protection;
- Be transparent (evidences, uncertainties and supporting documents must be available for decision-makers);
- Be consistent by following common and appropriate methods;
- Be comprehensive and cover environmental, social & cultural and economic data;
- Determine low risk– acceptable risk scenarios;
- Be precautionary: uncertainty, unreliability, inadequate information, limitations, methods restrictions, etc. have to be reported and acknowledged.

The guideline G7 of the BWM Convention details three risk assessment methods:

- Environmental matching risk assessment which investigates “the degree of similarity between the locations” in order to provide “an indication of the likelihood of survival and the establishment of any species transferred between those locations” (6.2.1 – G7). In short, this method documents and compares water abiotic conditions and considers their variations.
- “Species’ biogeographical risk assessment compares the biogeographical distributions of non-indigenous, cryptogenic and harmful native species that presently exist in the donor and recipient ports and biogeographical regions” (6.3.1 – G7). In short, records of native and non-indigenous species that have spread history and harmful potential are collected and their presence evaluated and compared.
- Species-specific risk assessment uses “information on life history and physiological tolerances to define a species’ physiological limits and thereby estimate its potential to survive or complete its life cycle in the recipient environment.” (6.4.1 – G7). In short, a list of target species detailing their physiological tolerance is established and investigated according to identified locations.

Thereafter, the “*Joint HELCOM/OSPAR Guidelines for the Contracting Parties of OSPAR and HELCOM on the granting of exemptions under International Convention for the Control and Management of Ships’ Ballast Water and Sediments, Regulation A-4*” were briefly discussed. These guidelines identify three steps in the risk-based exemption system:

- Data Collection (centralization/sharing of data);

- Risk assessment matrix established with adequate methods (regional guidelines); and
- Decision making with a decision support tool (automated, harmonized or not).

The third step reviews all data and the matrix developed during the two first phases of the risk assessment process. The decision process is made up of several stages:

- Review all data collected;
- Evaluate uncertainty level;
- Peer review process to enhance decision support credibility;
- Justify the decision and keep transparency;
- Provide high/moderate/low risk scenario based on risk matrix; and
- Issue (or not) the exemption (with or without restrictions).

Second part of the presentation

The second part of the presentation described the BWRF as a pre-arrival risk assessment tool developed to evaluate ballast water quality prior-ship's arrival.

The BWRF aims to anticipate and safeguard the port or terminal from unmanaged ballast water discharge by identifying high-risk ballast water in advance in order to determine mitigation strategies to implement before arrival, on arrival or after arrival.

The advantages to implement a BWRF, despite not being included in the BWM Convention are:

- To push ships to manage/consider ballast water;
- The simplicity of this tool to pre-assess BWM by ships;
- The low cost of implementation and relative administrative burden;
- Easy to implement. The IMO proposes a specific form to harmonize the practice;
- Useful tool to collect large amount of data to analyse the ballast water transit in the Port or in the region. Such data are useful for scientific purpose, identification of vulnerable areas and resource deployment;
- To target ships and to focus the limited resources of port authority on high-risk ballast water and ships;
- To support the training of inspectors in charge of BW control (Capacity building / training); and
- Efficient tool to make informed decision and plan mitigation strategies (anticipate and prevent) as well as support BWM preparedness.

During the presentation, several countries highlighted that this tool is already available in their ports, often on voluntary basis. In addition, it was recalled that the Turkish administration developed a risk assessment tool, which helps to analyze the BWRF and to identify high-risk ballast water sources.

4.4. Session three: Port- or Location-Based Ballast Water Treatment as contingency system

The presentation was done by Dr. Mario Tamburri. The objectives of the presentation were to:

- Identify the alternative methods to shipboard management systems; and
- Present some of the existing devices available to manage ballast water in case of emergency.

The presentation highlighted the possibilities to manage ballast water without onboard system. This management can be required as per national or local regulation and may be used as contingency systems available in ports.

Three options are available:

- Traditional onshore water treatment facilities;
- Barge-based mobile treatment facilities;
- Temporary portable treatment onboard vessels.

Each of these options possesses advantages and drawbacks. Therefore, their finality has to be clarified and each option properly assessed in terms of biological efficiency, social and economic impacts.

4.5. Afternoon: action plan review and joint project discussion

The goals of the afternoon were to enhance dialogue by organizing group work discussions on two topics:

- Topic 1: review of the outcome of the REGIONAL STRATEGY AND ACTION PLAN TO IMPLEMENT THE BALLAST WATER MANAGEMENT CONVENTION defined in Moscow in 2012; and
- Topic 2: discuss the relevance and propose foundations to develop a joint project.

The participants were divided in three groups: two Russian-speaking groups and one English-speaking group. Each group mixed Black Sea country representatives with Caspian Region country representatives. The IMO and UNEP experts facilitated the debates between the regions during the session.

Each topic was discussed for an hour and each group presented a 10-minute wrap-up in plenary.

4.6. Session four: topic 1 - action plan and strategic review

In general, the three groups confirm their full support to the 2012 strategy and action plan. However, the countries clarified and emphasized several points during their discussions.

- Despite being ratified by several countries, the promotion of the BWM Convention in both regions remains paramount. Some countries informed the audience that they are facing the final phase of the ratification process.
- Each group praised international cooperation and considered it relevant for the implementation of the BWM Convention. One group proposed the creation of joint working groups merging national experts. The countries confirmed their support to harmonized activities. They considered the risk-based exemption regime as one of the first tools to develop jointly.
- The establishment of a solid CME programme constitutes an important step towards a regional enforcement of the Convention. Despite the involvement of several countries in MoUs, a unified PSC regime could be developed to encompass regional specificities and needs. In this respect, the existing PSC could support the elaboration of an adequate CME. Before any guidelines are developed, a PSC gap analysis should be organized at national and regional level. However, PSCO training sessions supported by international experts would form opportunities to harmonize the CME practices and enhance multilateral cooperation. Training programme should encompass Flag State Inspectors and not be restricted to PSCO. A leading regional force could be created to circulate information, data and knowledge in the region. In this respect, some countries possess high expertise and could support the region by sharing their knowledge.
- The countries highlighted the need to enhance monitoring programmes in the region. Knowledge sharing of research activities could benefit the whole region. In addition, there is a need for international coordination to develop a systemic and proficient monitoring and research system. Several projects requiring regional cooperation were considered during the discussions:
 - The definition of a regional risk-based exemption;
 - The identification and definition of special zones for the release and exchange of ballast water;
 - The definition of a decision-making system to issue exemption as determined by the Helcom-OSPAR;
 - The creation of a common BWRF between the Black Sea and Caspian Regions to support data collection and risk assessment of ballast water prior to ships' arrival. Such form should be easy to implement on ships and similar to the IMO form.
- Capacity building and knowledge sharing are important to enhance cooperation and harmonize national practice. In this respect, regional seminars should be promoted and regularly organized. The regional action plan and strategy should promote the upgrade of the national rules.
- Divergent opinions emerged from the discussion on public awareness. Several representatives considered that the available information should

remain in the scope of the administration and experts. Information to the public should be controlled. However, the final decision to support or not public awareness remains a political choice. In parallel, one group encouraged the development of joint programmes for administration and seafarers.

- Some web-based instruments are already available in the region and remain easy to develop. Database sharing and computer-based system integration should be reinforced through the creation of an Information Center and portal. While data collection on ballast water and IAS remains under the national umbrella, a common database merging all sources should emerge from this cooperation. In addition, cooperation with other region would be beneficial to increase available data. However, the financing of cooperation and integration programmes remains an issue, particularly, when language adjustments are required.
- The Tehran Convention remains a good forum for regional discussion. Periodical reviews of the action plan and activities should be enhanced. The Tehran Convention, the Black Sea Commission and UNEP should support and finance such projects.

In short, the countries supported the present action plan and strategy. They also demonstrated a strong willingness to enhance cooperation with other regions and benefit from their expertise.

4.7. Session five: topic 2 - discussions on a possible joint project

In this session, the groups presented their various positions on the development of a joint project. During the presentation, Dr. Yegor Volovik and Mr. Mahir Aliyev shared their views and highlighted additional considerations.

Group 1 began its presentation by investigating the various options for cooperation. The group presented several possibilities to support such collaboration:

- The creation of a Memorandum of Understanding;
- The implementation through the Tehran and Bucharest Conventions;
- Identify commonalities between existing instruments to unite them.

Dr. Volovik recalled that mechanisms exist between those regional Conventions and acknowledged that it is difficult to develop something new instead of organizing cooperation between existing entities.

Mr. Aliyev laid down additional options or frameworks for cooperation: MoU and letter of intention (which exists between both regional Conventions). He highlighted that before defining a proper framework, lists of questions about the project have to be established. Such lists constitute concrete elements to distribute and discuss among the countries involved.

To bounce on Mr. Aliyev's remarks, group 1 listed some of the propositions to be inserted in a joint project:

- The existence of risk assessment software and experts in the Black Sea could support the development of a harmonized instrument covering both water basins.
- The Black Sea experience in the topic of BWM and IAS could be shared with the Caspian Region littoral states and initiate an exchange of knowledge.
- Organize a joint programme to locate the safe areas to upload and/or discharge ballast water.
- The implementation of a regional CME regime appears to be a good option to cooperate but it requires first creating harmonized programmes to train inspectors. Countries with PSCO and MoU experience could share their experience and support the other countries.
- Develop a regional framework for the development of a risk-based exemption regime. In this respect, the support of other regions could be helpful.
- Investigate the development of an onshore BWM facility.
- Create a database available for all the countries in order to support ballast water control and research programmes.

Dr. Tamara Shiganova added that:

- The monitoring of the area should be coordinated at the regional level.
- A complete list of targeted species should be determined and shared in both regions.
- The development of a joint database inventorying IAS could enhance the research and decision-making work.

Group 1 recalled that the implementation of a risk assessment system means understanding and knowing the port situation. In addition, group 1 raised the issue of funding for such monitoring programme.

Dr. Volovik reminded that national monitoring programmes are in place but the collection of data should be organized and shared at the regional level. A Ukrainian representative supported data sharing and the creation of a regional monitoring center.

Group 1 highlighted that a review of existing data should initiate such cooperation in order to avoid launching overlapping programmes because monitoring requires expensive resources.

To conclude group 1's presentation, Dr. Volovik underlined that an important aim of such project is to identify financing resources.

Group 2 began its presentation by recalling that the issue of IAS in both regions is related to shipping. Therefore, the primary objective of this kind of project should be to investigate the options to minimize the risks of shipping. The ratification of the

BWM Convention among Caspian countries constitutes a must and should be sped up.

This group recommended that the BSC PS and TCIS should sign an agreement and create joint working groups.

Several actions could be developed:

- A unified reporting form;
- Mechanisms to collect data at the national level;
- Development of a decision-making mechanism on the monitoring and management of ballast water;
- Create a harmonized approach to violations;
- Designate special areas to discharge high-risk ballast water;
- Training of PSCO;
- Develop mutual projects.

Group 2 also considered monitoring as a significant issue. The group promoted systematic and continuous monitoring in order to:

- Identify existing biodiversity and ecosystems;
- Prevent invasion and prepare contingency measures;
- Assess the impacts of invasions.

In this respect, the most vulnerable areas of both regions should be recorded and protected. The proper identification of vulnerable areas offers the opportunity to efficiently allocate the limited resources of each country.

Dr. Volovik concluded the presentation recalling the importance of harmonizing the monitoring systems in both regions.

Group 3 reminded that before any action or training of inspectors, the identification of the agencies in charge of the various CME processes has to be elucidated and the scope of responsibility of each agency clearly established.

This group emphasized the need to work with scientists particularly in the development of a risk-based exemption regime. Guidelines detailing the risk-based methods should be harmonized between both regions as well as a unified BWRP created.

Group 3 considered that guidelines and protocols have to be defined before launching further programmes in order for each country to work on harmonized foundations. In this respect, group 3 emphasized that, before exchanging data, collection methods and typology of data have to be determined in advance.

Therefore, this group considered the development of common protocols and guidelines paramount as a preliminary step to any further actions.

A representative of Azerbaijan recalled that stakeholders should participate in the various steps of the BWM strategy and in the data exchange system.

Dr. Tamara Shiganova concluded the session by reminding that a database must cover species but also routes of the ships and donor areas. These databases must be available and sufficiently elaborate to support risk assessment.

4.8. Closing ceremony

The closing ceremony was held on time. The rector of the Admiral Ushakov State Maritime University, Dr. Sergey Kondratiev handed the certificates of attendance to each participant as well as a GloBallast USB stick containing all presentations of the week and all relevant data. The organizers thanked the rector for his hospitality and the participants for their involvement during this meeting.

5. Meeting conclusion and assessment

The participants appreciated the meeting and enjoyed its content. The countries demonstrated their support to the present regional organizations and their agendas. They also praised the development of an enhanced cooperation programme. The participants presented numerous ideas and proposals to promote cooperation.

Among the most relevant, several deserve to be recalled:

- The development of common protocols and guidelines;
- The designation of a coordinated monitoring programme;
- The creation of a unified BWRF to assess ballast water prior arrival;
- The development of a joint database through the integration of existing national data;
- The elaboration of a harmonized CME regime with a consistent training module;
- The development of a procedure to coordinate emergency response;
- The definition and implementation of a regional risk-based exemption regime.

These ideas constituted the core of the discussions but are not the only ones. It shows that there is room for a joint Black Sea and Caspian Regions project. However, several countries highlighted that a plan for funding should be clearly defined.

The assessment of the meeting can be found in the annexes. In summary, the meeting was successful and met its objectives. The risk approach and its various components (risk management, risk assessment and biosecurity) were particularly valued.

According to the participants, the most interesting and relevant topics were (in brackets: number of comments related to the topic):

- Risk assessment & implementation of a risk-based exemption system (IMO G7) & Risk assessment by using BWRP (5);
- Risk based-approach (risk management tool) & BWM Convention as a risk control mechanism (5);
- Biosecurity approach in BWM context (3);
- Marine bio-invasion and countermeasures (2);
- Ballast water treatment Plant & BWM options (2);
- Topics of Raphaël Baumler (2);
- Implementation of the Convention in RF (2);
- Scientific investigation, results and forecast;
- Explanation of the application of standards D-1 and D-2 in different countries of the BS-CS region;
- Fleet movements between BS and CS region and limitation to control ships in compliance with the BWM Convention;
- Practical examples of the countries;
- FSC and PSC.

The participants considered that the following topics should be emphasized, developed or added to the schedule:

- Additional practical example (2);
- To add economic approach and cost estimation of the implementation (2);
- Ballast water and sediments management risk control.

Annex 1 – List of Participants

Organizers	Name, country	Institution, position	Contact details
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7.	Mr. Elchin Mammadov, Azerbaijan	Ministry of Ecology and Natural Resources, Senior Scientist	evmamedov@mail.ru, (0099412) 4962280, (0099450) 4939262
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25.	Mr. Nikolay Lysenko, The Russian Federation	PSC Officer, Tuapse Maritime Port Administration	map@tuapseport.ru (86167) 76400, Tuapse
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27.	Ms. Olga Yasakova, The Russian Federation	Institute of arid zones, Academy of Sciences of Russian Federation	ssc-ras@ssc-ras.ru, тел. (863) 263-77-51, тел/факс (863) 266-56-77, Rostov-on-Don
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32.	Mr. Anastas Boran-Keshishyan, The Russian Federation	Head of navigation department. Admiral Ushakov Maritime State University	93 Lenina av., Novorossiysk, Russia Telephone: +79181144443 e-mail: bk.anastas@gmail.com
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35.	Mr. Evgeny Khekert, The Russian Federation	Deputy Head of Admiral Ushakov Maritime State University	93 Lenina av., Novorossiysk, Russia Telephone: +79887693996 e-mail: Zheny71@mail.ru

Annex 2 – Programme of the meeting

DAY ONE: THURSDAY 12 DECEMBER 2013

0830-0900 *Registration*

0900-1230 – REGIONAL UPDATE: PAST AND PRESENT SITUATION OF IAS IN THE REGION

0900-0930 Welcome words

- Dr. Sergey Kondratiev, Rector of the Admiral Ushakov Maritime State University;
- Mr. Mahir ALIYEV, Regional Coordinator, Tehran Convention (interim) Secretariat, UNEP; and
- Mr. Antoine Blonce, Technical Adviser, IMO-GloBallast.

0930-1030 Marine Bio-invasion and counter-measures in place and under development in Russian Federation and in the Region - Latest developments/ data collection methodology, monitoring programme / research in the region with particular focus on Caspian Sea
Dr. Tamara Shiganova (IMO-GloBallast Consultant)

1030-1100 *Coffee Break*

1100-1145 Review of the Study on ship-borne transfer of invasive species to and from the Caspian Sea - introduction to geography of the region and identification of main risks
Dr. Tamara Shiganova (IMO-GloBallast Consultant)

1145-1230 Fleet movement between Caspian and Black Sea regions and limitations to certain ships in complying with BWM Convention requirements
Capt. Raphael Baumler (IMO-GloBallast Consultant)

1230-1400 *Lunch*

1400-1700 - REVIEW OF THE STUDY ON SHIP-BORNE TRANSFER OF INVASIVE SPECIES TO AND FROM THE CASPIAN SEA

1400-1530 Short update on present developments by countries in Caspian and Black Sea regions:

Implementation of the BWMC in RF: National / local regulations in place, their implementation and practices – followed by participating countries:

1530-1600 *Coffee Break*

1600-1700 Plenary Discussion on the review and any other issue related to the implementation of the BWMC

DAY TWO: FRIDAY 13 DECEMBER 2013**0900-1230 – APPLICATION OF BIOSECURITY RISK APPROACH FOR EXEMPTIONS AND TARGETED CME: PRE-ENTRY (RISK ASSESSMENT AND TARGETING)/ ON ARRIVAL (PSC – BWM EFFICIENCY VERIFICATION AND/OR CONTINGENCY MEASURES)**

0900-0945 Practical application of risk-based approaches to biosecurity, management for Caspian-Black Sea inter-regional shipping: Introduction of the concept of risk-based approaches to manage marine biosecurity and its relevance in shipping / case study on traditional or integrated policy
Capt. Raphael Baumler (IMO-GloBallast Consultant)

0945-1030 Feasibility of implementing a risk-based exemption system (IMO G7 guideline) for Caspian-Black Sea traffic – Information needs, specific actions that need inter-regional cooperation and possible next steps
Capt. Raphael Baumler (IMO-GloBallast Consultant)

1030-1100 Coffee Break

1100-1145 Application of risk assessment to facilitate and optimize compliance monitoring and enforcement for ships sailing between the regions that are not exempt – information needs, need for regional cooperation and possible next steps for information collection
Capt. Raphael Baumler (IMO-GloBallast Consultant)

1145-1230 Port-based contingency plans for ships that are neither exempt nor met the Convention requirements (barge based BW reception/treatment, ballast discharge in designated areas etc.)
Capt. Raphael Baumler (IMO-GloBallast Consultant)

1230-1400 Lunch

1400-1700 – GROUP DISCUSSIONS AND WAY FORWARD

1400-1430 Plenary Discussion on present practice and existing PSC regime and need for inter-regional cooperation on PSC – next steps

1430-1530 Group discussions on:

- Identification of high-priority needs for information collection to apply risk-based approaches and contingency measures discussed above
- Institutionalizing inter-regional cooperation (establishment of an inter-regional task force) and its connection to regional arrangements/strategy and existing regional environmental convention frameworks
- Developing a Terms of Reference and key areas to focus for such Inter-regional Task Force
- BWRF & unification of targeting system

1530-1600 Coffee Break

1600-1700 Review of the group discussions and the next tasks to develop a roadmap for future actions and resource mobilization
Dr. Tamara Shiganova and Capt. Raphael Baumler
(IMO-GloBallast Consultants)

1700-1730 – CLOSING CEREMONY

Annex 3 – Opening remarks

1- IMO-GloBallast – Mr. Antoine BLONCE

Dear Participants,

I am glad to welcome you again for this second activity of the week back-to-back with our first training we just had on Compliance Monitoring and Enforcement of the Ballast Water Management Convention.

The topic for the upcoming meeting, today and tomorrow, will be the Harmonization of the implementation of the Ballast Water Management Convention between the Black Sea and the Caspian Sea Regions.

This Inter-Regional meeting dedicated to address the transfer of invasive species between your 2 regions was made possible with the support of the Government of the Russian Federation, the Admiral Ushakov Maritime State University, the GEF-UNDP-IMO GloBallast Partnerships Programme, the Black Sea Commission and the United Nations Environment Programme through the Interim Secretariat of the Teheran Convention.

I hope you will be able to use the knowledge you just acquired on the BWM Convention in order to have very fruitful discussions on how to address this issue in your specific Regions. For this you will have the help of 2 new consultants, Dr. Tamara Shiganova and Captain Raphael Baumler, we have a very busy schedule for the upcoming 2 days so without further do I will leave the floor to the experts to start the presentations and discussions.

Thank you very much.

Antoine Blonce
Technical Adviser
GloBallast Partnerships Programme
International Maritime Organization (IMO)

2- UNEP – Mr. Mahir ALIYEV

Distinguished Delegates, Dear Colleagues,

Let me start by saying how excited and happy I am to see the collaboration of countries of the Black Sea and the Caspian Sea basins at this important event, which unites the two Conventions – The Bucharest Convention on the Protection of the

Black Sea against Pollution and the Tehran Convention on the Protection of the Marine Environment of the Caspian Sea.

The Black Sea basin accounts for over 20 years of collaboration among the littoral states for addressing environmental issues of common concern. This year, we are celebrating the 10th Anniversary of the Tehran Convention which sets legal frameworks for collaboration over the environmental issues in the Caspian Sea. Long years and a lot of effort have been put by the littoral states and international partners into the protection and improvement of the environment within these two water bodies.

Today, we are witnessing the inception of a new form of cooperation, the one that brings together the Black Sea and the Caspian Sea basins in a collaborative effort to address the environmental challenge which concerns them both – elimination of environmental risks of ballast water carried by the shipping transport between the Black Sea and the Caspian Sea through the Volga-Don Canal.

It is not by chance that this event is organised in the Russian Federation, on this beautiful coast of Novorossiysk. Russia's Volga-Don Canal links the two basins and the port of Novorossiysk is an important hub for the administration of issues related to the ballast water management.

I would like to join the previous speakers in thanking the Russian Federation as the host country and the Admiral Ushakov Maritime State University for the excellent organisation of this meeting under the leadership of its Rector, Dr. Sergey Kondratiev.

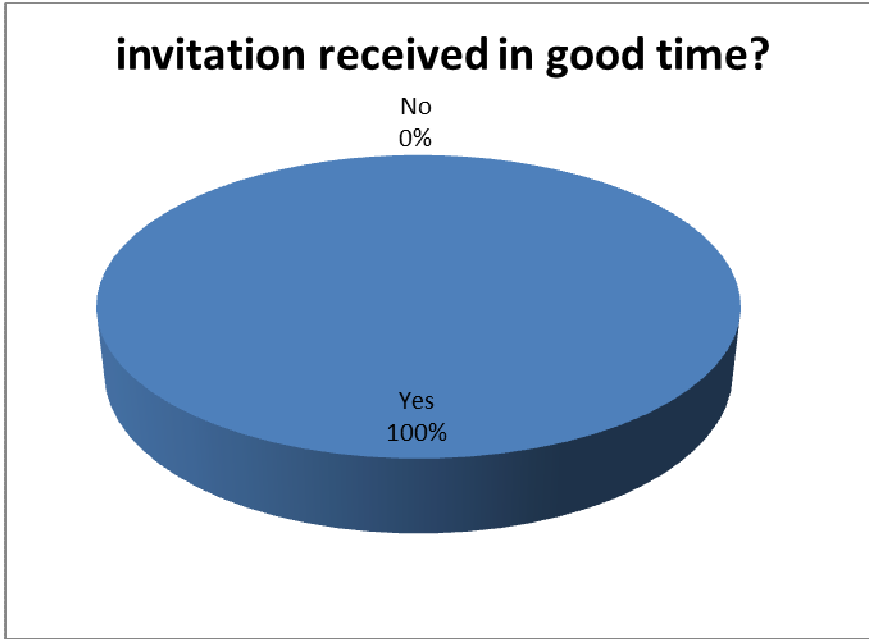
The United Nations Environment Programme, the International Maritime Organisation, the Black Sea Commission and the Tehran Convention Interim Secretariat, which have initiated this meeting, place great hopes with the continuation of this cooperation and look forward to its outcomes translated into a better management of aquatic bioresources in the Black Sea and the Caspian Sea basins. I wish you a successful meeting!

Thank you

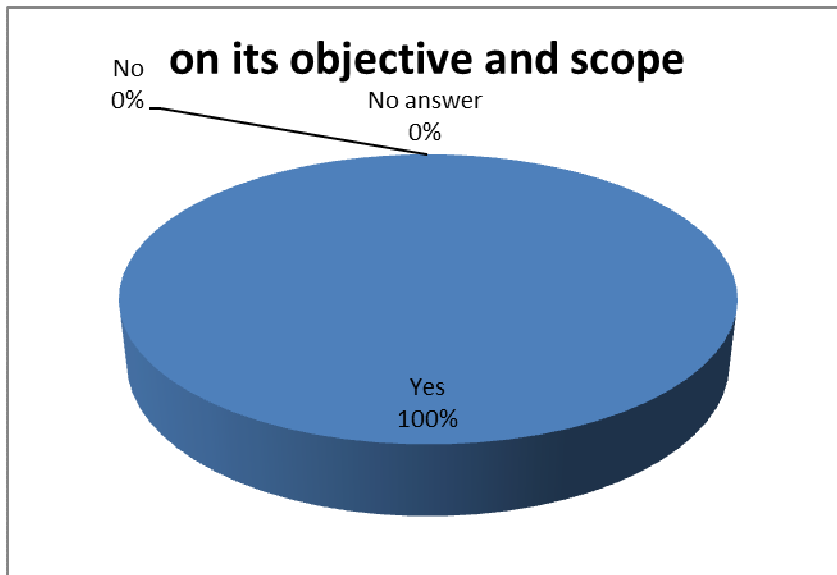
Mahir Aliyev
Regional Coordinator
Tehran Convention Interim Secretariat
United Nations Environment Programme

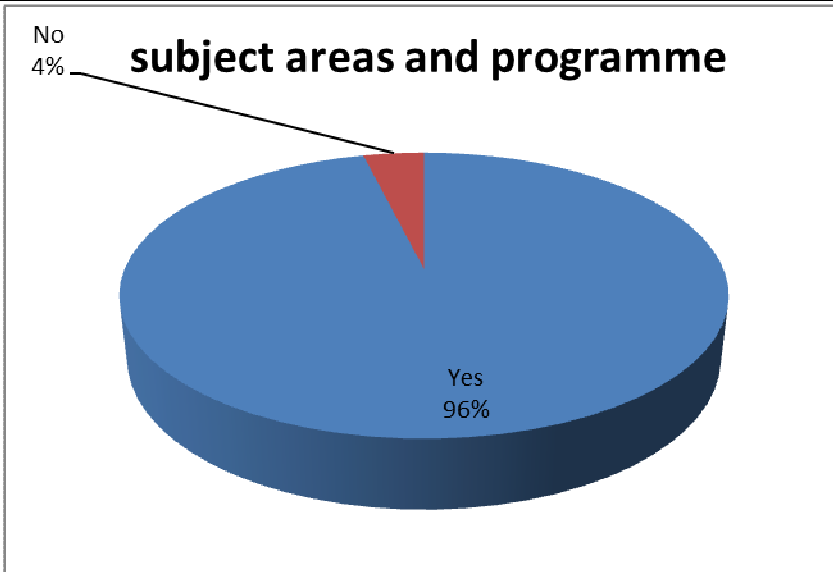
Annex 4 – Assessment

1 Was the invitation received in good time?

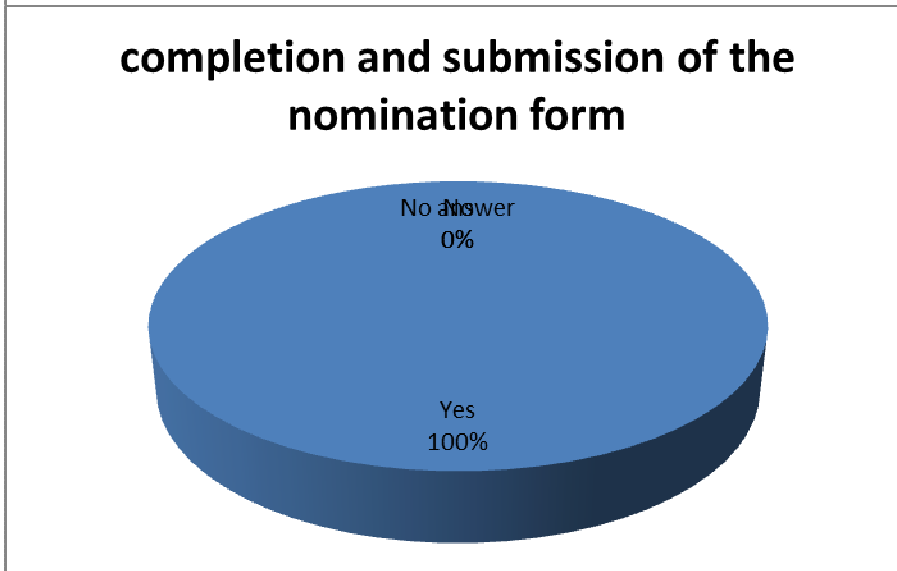
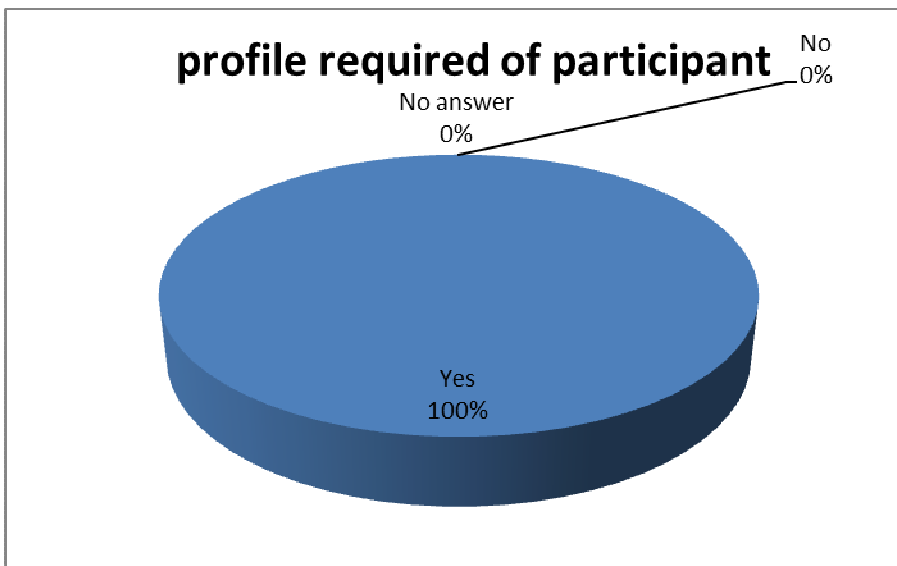


2 Did you receive the information listed below about the event before your participation





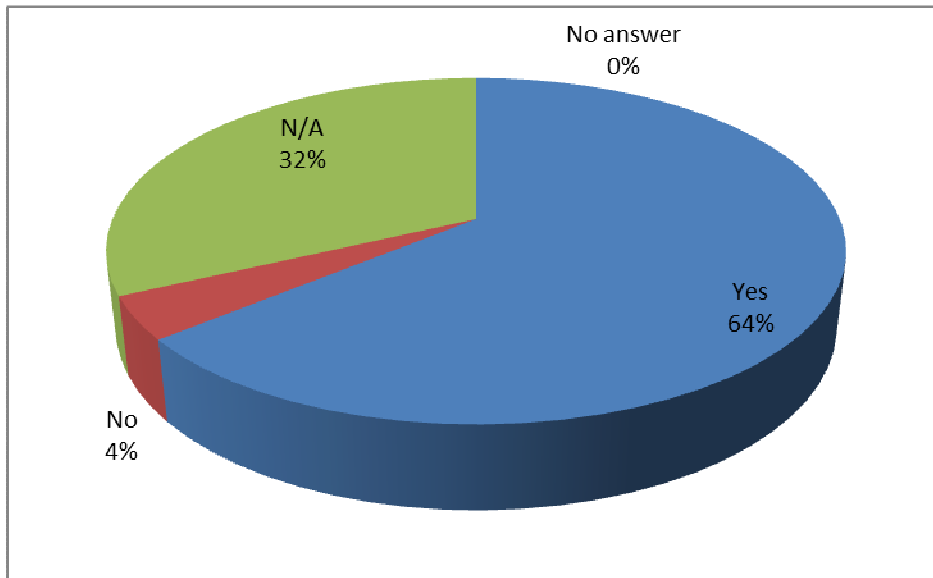
3 Were the instructions on the following clear and easy to understand?



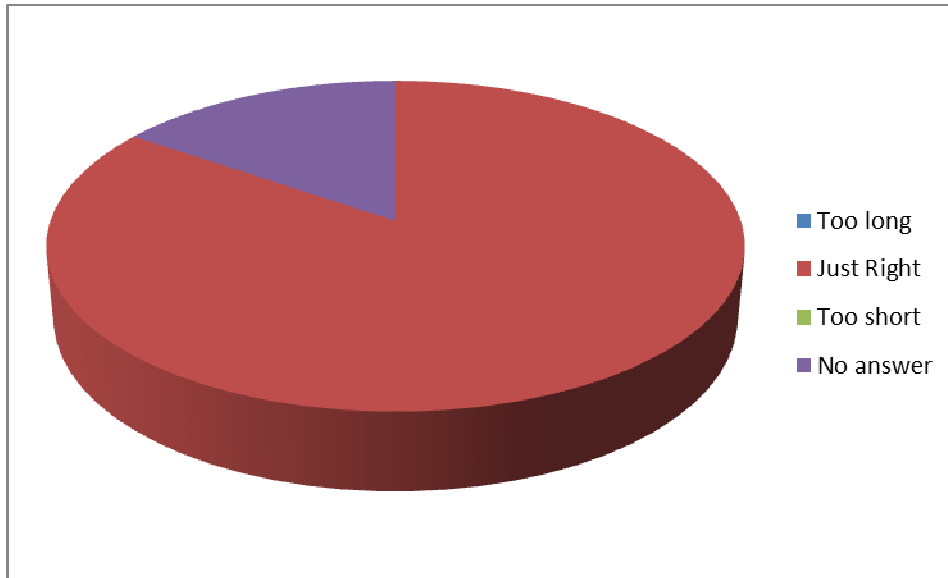
4 Did you receive logistical information on time



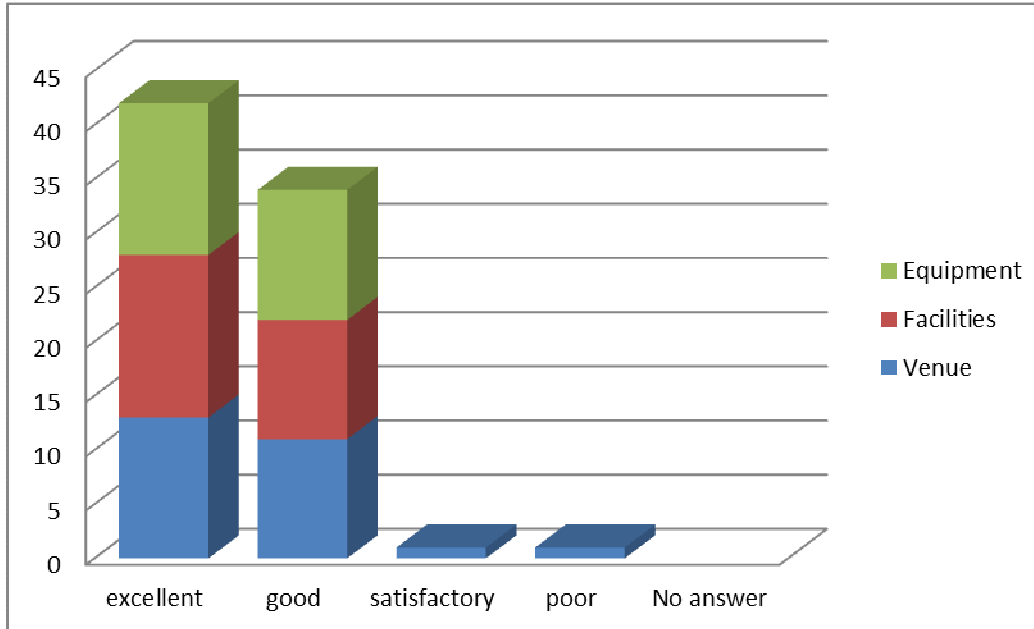
5 If you were given any pre-event assignment, was it useful?



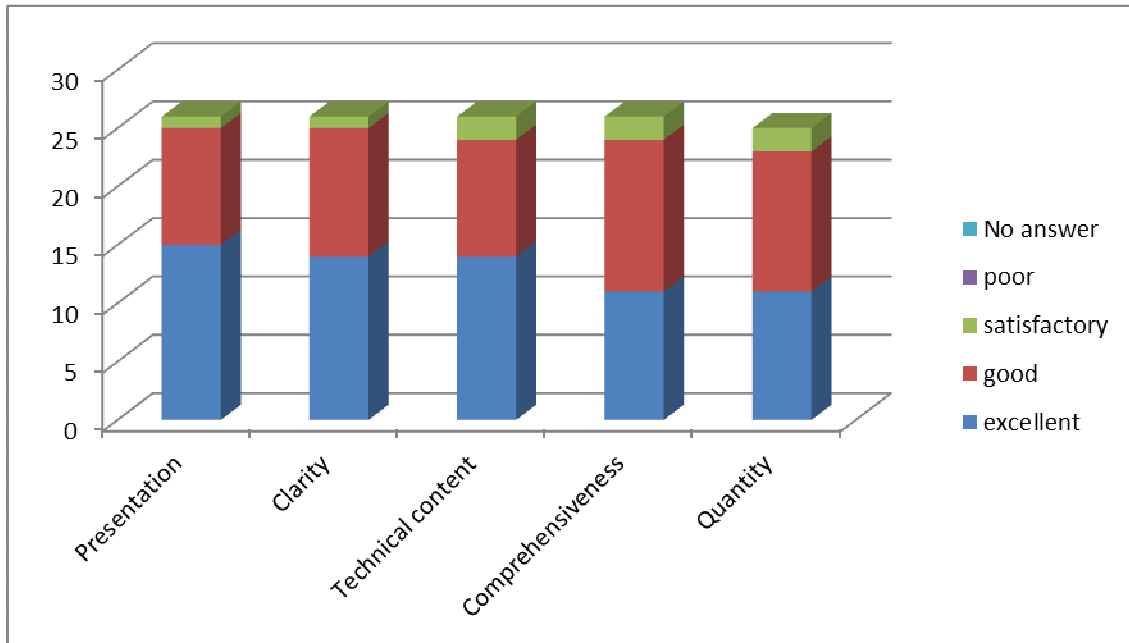
6 To cover the topics fully, was the event (please check the appropriate box)



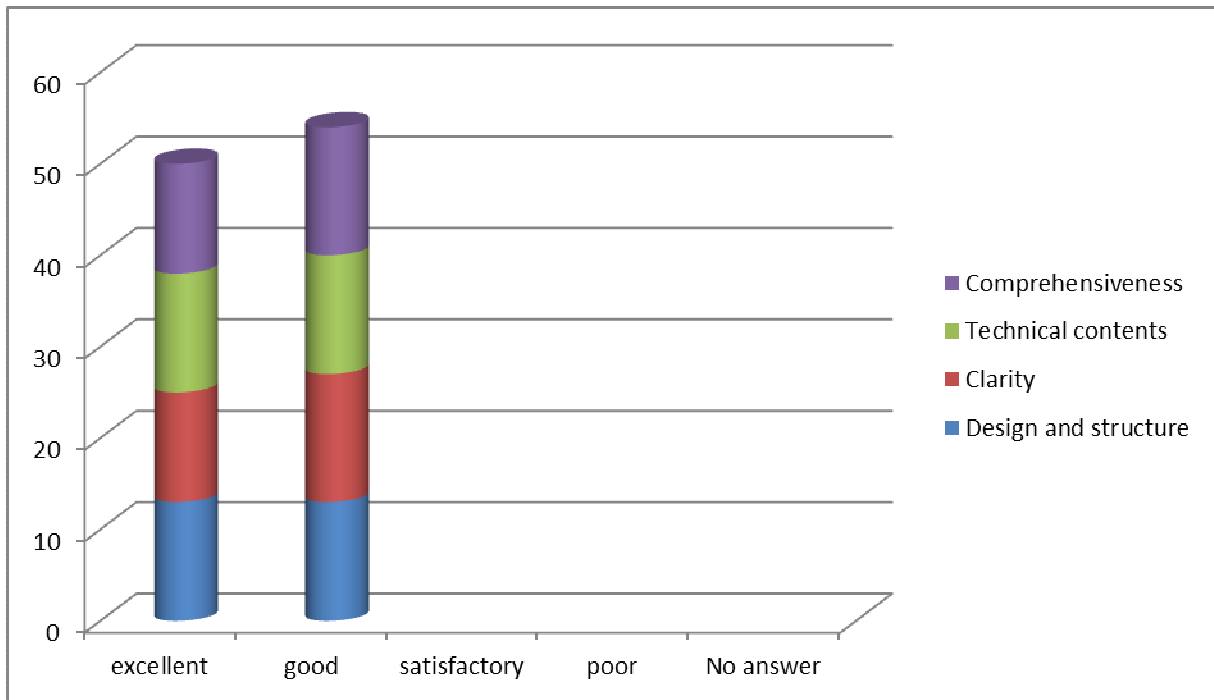
7 How do you rate the event with regard to the following?



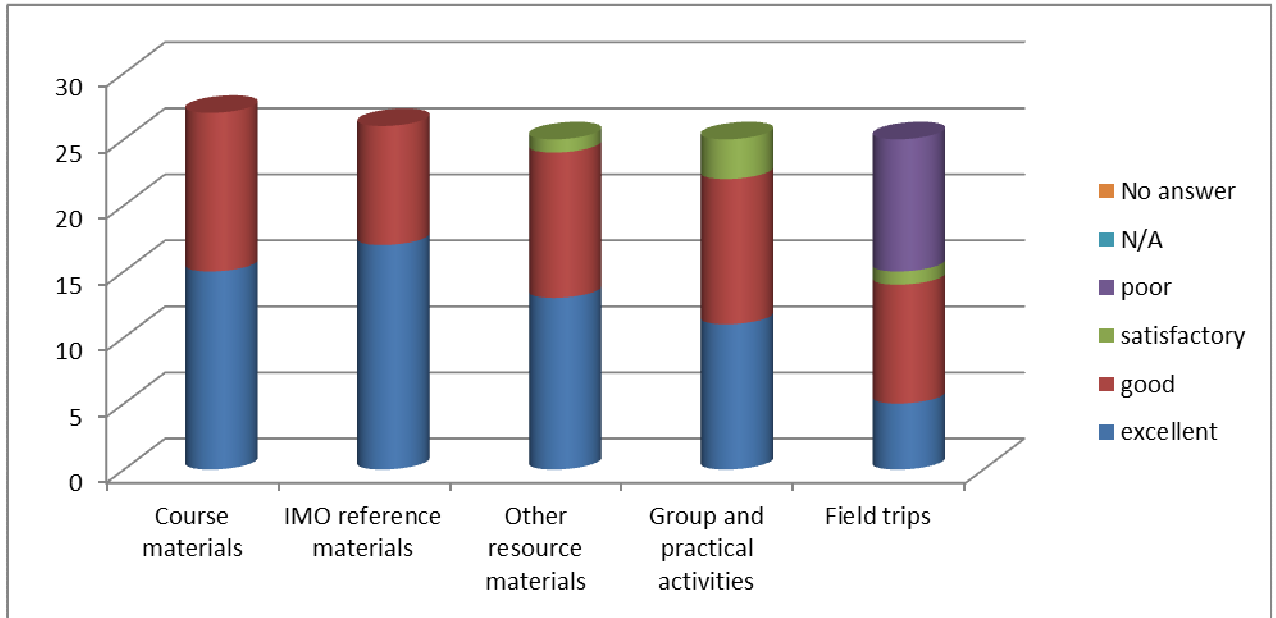
8 How do you rate the following aspects of the materials?



9 How would you rate the following aspects of the presentations?

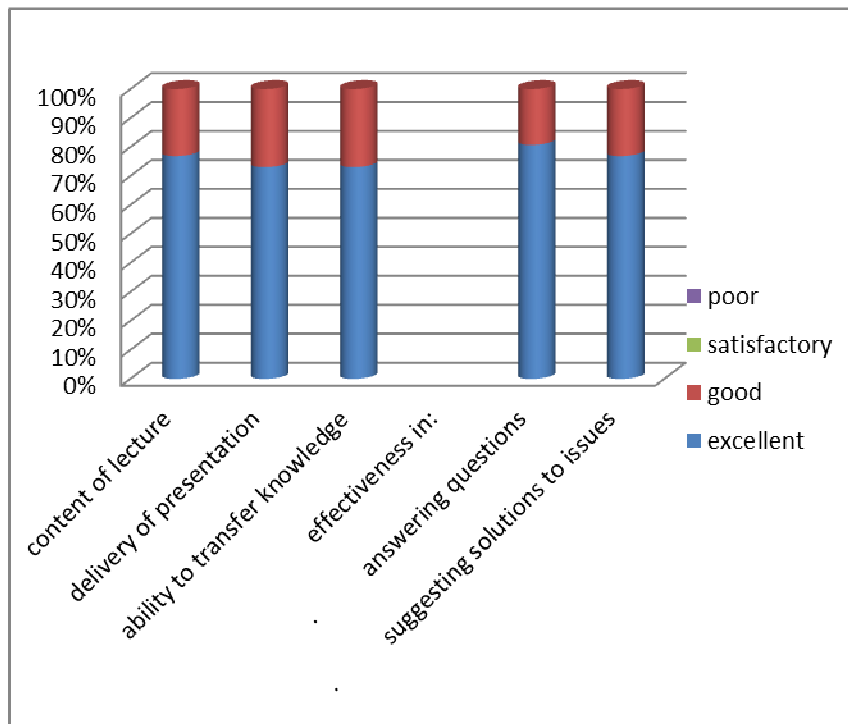


10 How would you rate the use of the following?

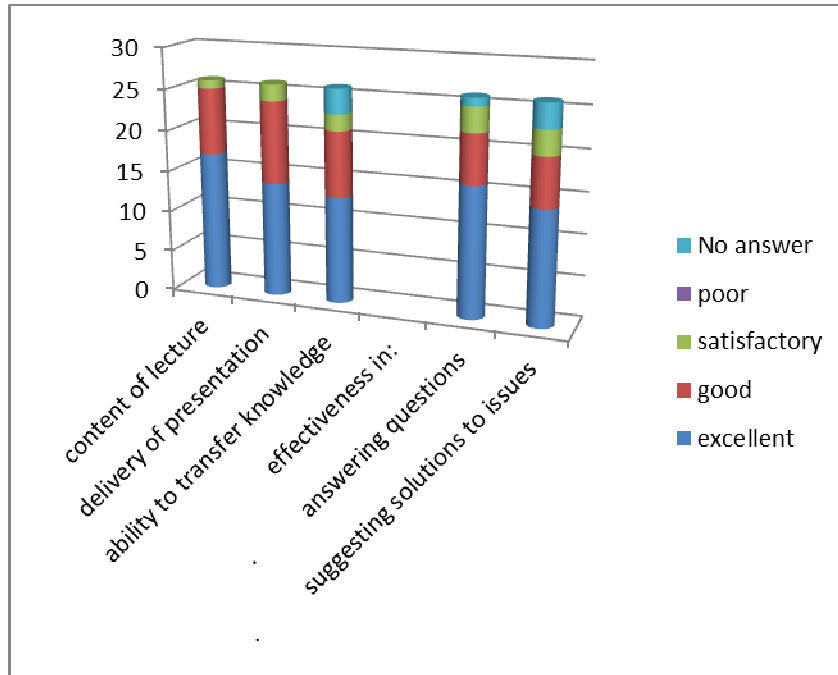


11 Please rate each lecturer with regard to the following

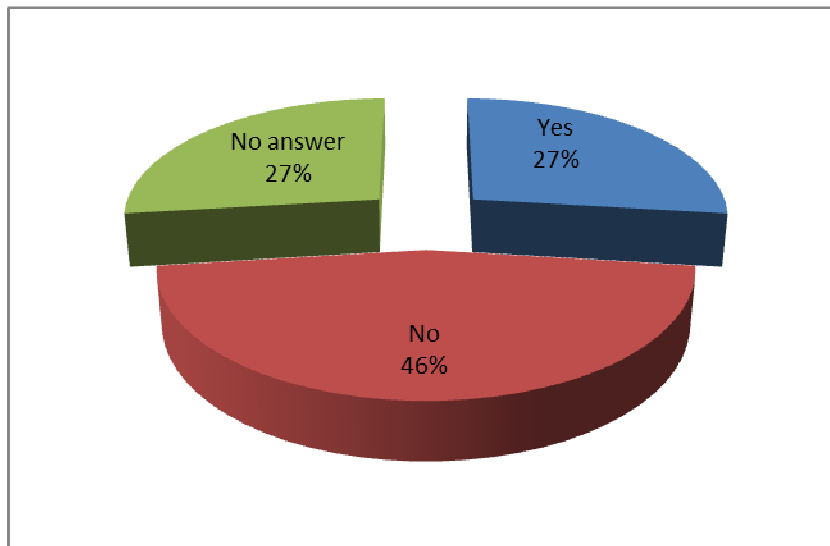
11.1 Name of lecturer : BAUMLER



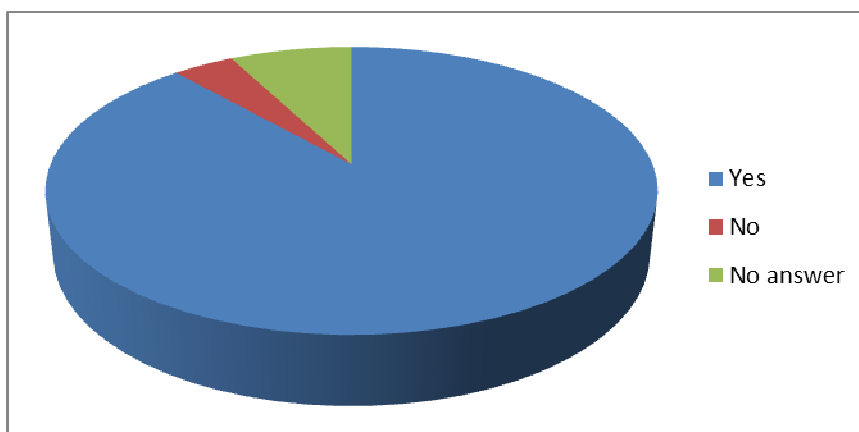
11.2 Name of lecturer : SHIGANOVA



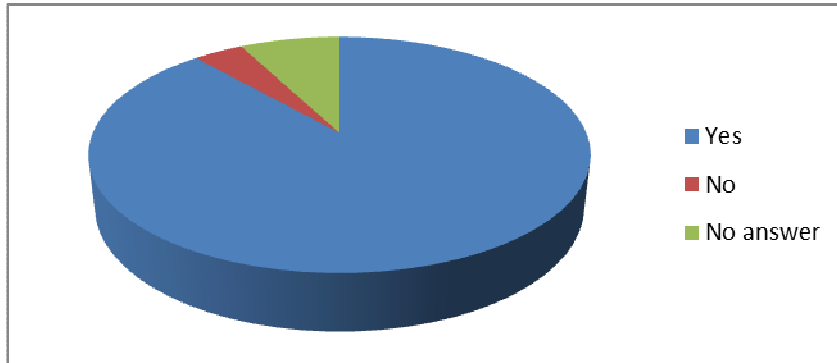
13 Are there any topics which should be added?



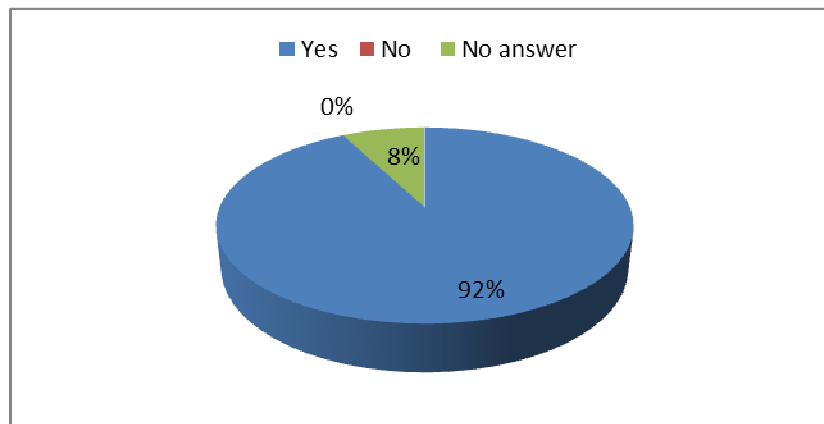
14 Do you consider that the objective of the event was met?



Are you likely to use the information you gained on the course when you return 15 to your work?



Will you have the opportunity to transfer the knowledge gained to 16 your colleagues at work?



Annex 5 – Pictures

Pictures of the meeting at the Admiral Ushakov Maritime State University are available on:

<http://fotki.yandex.ru/users/brav-vmf/album/207411/?>



Annex 6 – Review document of the 2006-Study on ship-borne transfer of invasive species to and from the Caspian Sea

Aims of the present working document:

- Set the context of the Ballast Water Management Convention
- Review and update of the document “Study on ship-borne transfer of invasive alien species to and from the Caspian sea” (2006)

1. Introduction – the context

In addition to unsustainable fishing, climate change, great river discharge, pollution and waste, the loss of biodiversity and habitats related to the introduction of Invasive Alien Species (IAS) is considered as one of the four greatest threats to semi-closed and closed seas.

Man activities have drastically modified the dynamics of species interactions since he colonized and related all parts of the world. In short, humankind through its activities possesses the power to interfere inside ecosystem mechanisms. This intrusion destabilizes ancient eco-systemic adjustments of species and jeopardizes local ecosystems functioning.

Whatever the root cause of introduction (intentional or non-intentional), IAS endangers environments by modifying local pseudo-equilibrium and ecosystem functioning. Over time, IAS may damage essential biodiversity benefits, which, for several of them, support important human activities. Consequently and beyond environmental damages, human activities and health as well as food security are seriously threatened.

While shipping is an essential human activity in our present world, ships are also major vectors of un-intentional introduction of IAS. Consequently, biosecurity threats, as consequences of shipping, are negative externalities of this activity. Among the various pathways contained by vector-ship, two of the major ones are ballast water (BW) and biofouling.

In order to address the risks related to BW transfer, the international community adopted the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004. This Ballast Water Management Convention (BWMC) is under its final ratification stage. Thirty-seven States ratified the Convention representing more than 30% of world feet. Today, the influence of less than 5% of the world tonnage is expected to trigger the entry into force.

The ratification of the Convention is an important step to address the issue of IAS in the marine environment and ultimately to protect world waters from the biological threats of ships. The international nature of this Convention highlights the need for multilateral cooperation. In this respect, the regional level of cooperation is particularly relevant in the Black and Caspian seas region.

A man-made canal relates these seas and therefore opens invasion gates between the seas, which possess similarities in their physical and natural conditions. Therefore, invasion may spread rapidly and impact the whole area. The catastrophic damages related to the introduction of the *Mnemiopsis leidyi* represent an emblematic example.

In this respect, regional cooperation is paramount to enhance tight control of BW movement, identify and manage major risks and develop adequate control measures without affecting the economic benefits of trade.

The review of the Study on ship-borne transfer of invasive species to and from the Caspian Sea constitutes an opportunity to re-assess the regional situation and discuss the action plan to move forward and ultimately protect regional ecosystem and livelihood of its inhabitants.

2. Review of the document “Study on ship-borne transfer of invasive alien species to and from the Caspian sea” (2006)

Original document Commissioned by
International Maritime Organization (IMO)
Caspian Environment Project (CEP)
UN Office for Project Services (UNOPS)

Study on ship-borne transfer of invasive alien species to and from the Caspian Sea.

ASSESSMENT OF SHIPPING TRAFFIC AND BALLAST WATER MOVEMENTS TO AND FROM CASPIAN SEA, AND PRELIMINARY APPRAISAL OF POSSIBLE BALLAST WATER MANAGEMENT OPTIONS

Objectives of the study:

- Study the passages of ship borne invasion to/from Caspian Sea (CS)
- Identify effective measures to address AIS transit from Black Sea (BS) – Caspian Sea (CS) waterway (BS-CS waterway)
- Raise awareness on the issues to develop adequate strategy

In order to fulfill these objectives, the study is divided in three parts:

- Description of the waterway to the Caspian sea

- Shipping activity and Ballast Water movements
- Appraisal of practical BW management options

Limitation of the study:

- Desk-top review and does not intent to be an 'executable' BW management strategy
- BW management system are under development and technology at the time of the report was not consider mature
- Inherent methodology limitations
- New information and data may obsolete elements of the report
- Cannot constitute legal advices

Black Sea / Caspian connection and specificities

Before and lastly during the Pliocene (5.3 to 3.6 Million years ago), the Black, Azov, and Caspian Seas (Ponto-Caspian) were united as a single basin several times. They were connected in the almost freshwater Pontian Lake-Sea. The freshwater environment affected the marine biota and a brackish-water biota then formed. Its representatives still dwell in the Caspian Sea, the Sea of Azov, and in desalinated regions of the northwestern Black Sea; these are referred to as Pontian-Caspian species.

Now, the Ponto-Caspian seas are inland semi-closed or closed seas. They have limited exchange with the oceans (the Black Sea) or with no such exchange (the Caspian Sea).

After being naturally isolated, in 1952, the Volga-Don man-made canal created an artificial connection between these seas. Thus, through the Black Sea, the Caspian Sea is related to the Mediterranean Sea via the Bosphorus/ Marmara/ Dardanelles way. This recent connection opens the Caspian Sea to world shipping and its related environmental consequences. Despite relatively low diversity of species, the seas have high productivity. These unique features have made them vulnerable to invasions.

The Black Sea is a non-tidal, miromictic basin with a thin (60–200 m) surface layer of oxygenated layer. Beyond this layer, the water column is a virtually lifeless, hydrogen sulfide environment.

The narrowness of the active layer renders the ecosystem of the Black Sea extremely vulnerable to climatic changes and anthropogenic impacts. The present flora and fauna, which were formed under conditions of relatively low salinity (17–22‰) and the existence of an anoxic zone beneath the upper oxygen-containing layer are distinguished by low species diversity of most taxonomic groups and complete absence of many of them. However, the biota is highly productive, especially in near-shore regions, because of a high abundance of key planktonic and benthic species and large populations of commercial fish species.

The Black Sea biota is 80% of Atlantic-Mediterranean origin, 10.4% of freshwater origin, 9.6% of Ponto-Caspian origin and a small Arctic assemblage.

The Caspian Sea is the largest inland water body; its shelf zone (< 100 m depth) occupies 62% of its surface area. Physical geography and bottom topography divide the Caspian into Northern, Middle, and Southern regions. Sea-level oscillation is one of the main factors that determine the status of its ecosystems. During the 20th century, environmental conditions deteriorated significantly, mainly owing to sea-level changes, river runoff, and pollution from multiple sources including petroleum hydrocarbons and phenols.

The most ancient and abundant species are autochthonous (Ponto-Caspian) species (84%). Freshwater species (13%), arctic species (3%), and Atlantic-Mediterranean species (1%) compose the remaining part of the ecosystem species. Over time, these species have become full members of Caspian communities, and evolved considerably.

The principal causes of the high degree of faunal endemism lies in the long-term isolation of the basin and its salinity regime. The low salinity and its native biota restricted colonization by many marine species and, at the same time, constrained access by freshwater species. In spite of low biodiversity, the Caspian Sea has high productivity, particularly in the Northern Caspian, and rich fish stocks.

Invasions in Black Sea and Caspian Sea

Since the late 20th century, numerous marine and brackish water species have arrived in Black Sea harbours in ballast water and on fouled hulls. Biotic changes have also been caused by other human activities: release by aquarists, deliberate stocking of commercial species and release of species that accompany them, penetration via canal systems connecting previously isolated basins. During recent decades a new vector has accelerated introductions – expansion of warm-water species from the Sea of Marmara and Mediterranean Sea owing to rising upper layer temperatures. Main pathways of species penetration to the Black Sea based on an analysis of established non-native species and their donor regions are shown in Figs. 1 and 2.

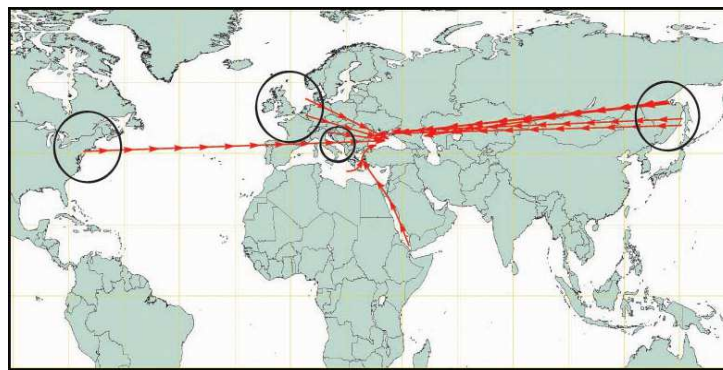


Fig.1: The main regions-donors of invasions into the Black Sea (Shiganova, 2010).

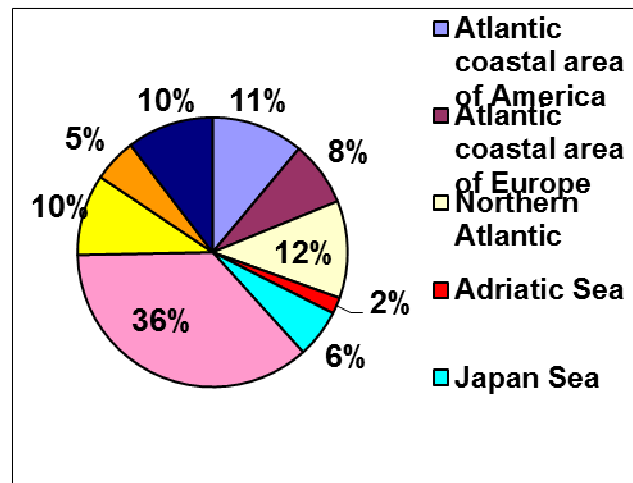


Fig. 2: Donor areas of the non-native species and their percentage in the Black Sea (Shiganova, 2010).

Increased shipping and construction of Volga-Don Canal caused the Black Sea to become a recipient and donor area for marine and brackish water species. It serves as a hub for species that then spread further to the Sea of Azov and the Caspian Sea, and also to the Sea of Marmara and in some cases to the eastern Mediterranean Sea. The location of the Black Sea is crucial. Situated between the species-rich Mediterranean Sea and the species-poor Azov and Caspian seas, the Black Sea is also intermediate between these seas in abiotic conditions: much lower salinity than the Mediterranean but higher than the Sea of Azov and the Caspian Sea. Anthropogenic disturbance of the Black Sea has also increased vulnerability; for example, eutrophication and overfishing of top fish.

The Caspian Sea ecosystem was the most vulnerable to invaders because of its long isolation and high level of endemism.

A non-natural introduction phase started when the Volga-Don Canal opened the Caspian environment to the Black Sea threats. First most of benthic and macrophytes species were carried from the Black Sea by ships as fouling organisms. The second phase began in the early 1980s with the release of ballast water.

All established non-native species, which arrived with the ship, were brought from the Black Sea. Among invaders some species arrived from other regions through the Black Sea – e.g. *Mnemiopsis leidyi* arrived from North America.

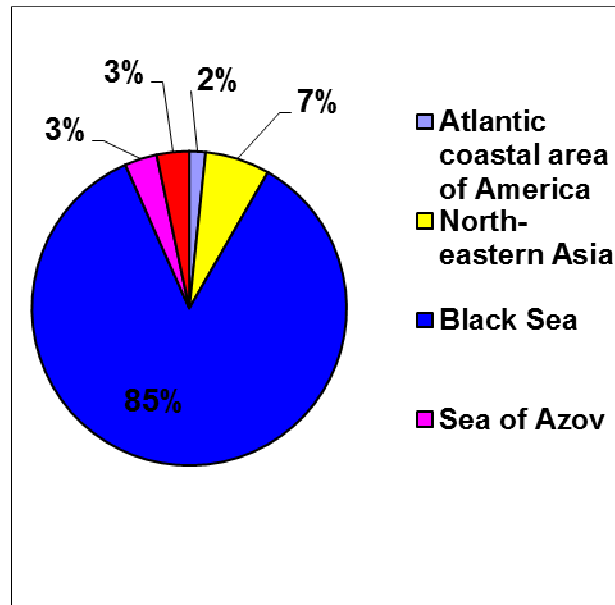


Fig.3: Donor areas of the non-native species and their percentage in the Caspian Sea (Shiganova, 2010).

In addition to intentionally introduced species such as the Black and Azov Seas fish, forage organisms and freshwater commercial fish, other species were introduced with fouling communities and ballast water.

Investigations (Shiganova, 2010) showed that there is no way back to the Black Sea from the Caspian Sea. Caspian biota was formed under specific conditions of closed basin and low salinity and these species cannot survive in the Black Sea where salinity is higher and conditions closer to marine environment. So, if Black seas species are clear threats to Caspian ecosystem, the contrary is not valid.

Short description of the waterway to the Black and Caspian seas

While Caspian Volga system and Black Sea Don system were separated for geological times, the Unified Deep Waterway System (UDWS) of the Russian Federation connected them. The Caspian Sea is not anymore isolated but related to the Black Sea via the Volga-Don Waterway and to the Baltic Sea via the Volga-Baltic Waterway.

These man-made connections open the Caspian Sea to the world shipping networks. Consequently, the waterways and the ships carry numerous unexpected and unwanted species which never been in contact before. Some of the species spread naturally through the waterways while ships are vectors with pathways carrying unwanted biological threats. So, isolated one from another, ecosystems met and collide. This recent relationship constitutes a shock, which modifies ancient equilibrium. Today, opened to the Black Sea species, vulnerable Caspian ecosystems are jeopardized.

The Volga-Don Waterway (VDW) is a 1670km long water system combining rivers, dredged channels, locks, canals, an artificial reservoir and coastal areas. In this system, the transfer of unmanaged Black Sea BW to Caspian region represents a major risk for the recipient environment.

The researchers studied the water system connecting both seas and identified a location that could support a regional BW strategy. They determined that the locks between Lower Don and Tsymlyanskoye Water Reservoir form a human-operated barrier against natural invasion. This man-made barrier may unplug the link between the Black Sea and Caspian Sea. If only managed BW could cross this barrier, the Caspian Sea could be re-isolated from Black Sea and preserved from invasions. In short, a proper management control system should ascertain that ships crossing the locks carry only managed waters. So, the research suggested that BW management solutions and ship controls should be done before the ships pass the locks.

Shipping and BW movement in the region

This part aimed to establish the main Ballast Water transfers in the region by studying ships characteristics and trade patterns. Supported by a Ballast Water Reporting Forms created for the study, numerous data were collected and analyzed. The study identified the area and practices of loading and discharging ballast water by ships in the region. In addition, it provided an estimate of BW movements to and from the Caspian region.

By focusing on ships and their routes, the study identified the main trends for invasions and particularly vulnerable areas as well as determined preliminary principles to address the issue of BW management on board ships.

Several factors influence ships' design and operation in the sector.

- Physical conditions of the area impose strict limits on ships. Draft (3.5m) and air draft (max.14m) limitations as well as locks constraints reduce ships' size able to transit in the area. Designed to maximize cargo capacity, ships reach limits and reduce non-cargo spaces. Ships operate close to maximum permitted draft; under keel clearance is small, which influences the quality of the water taken. Therefore, the ships load large amount of sediments in turbid waters. The sediments accumulate and may become a permanent source of contamination. In addition, ship size influence space distribution. Non-cargo spaces are reduced to maximize cargo carrying capacity and to reduce Gross Tonnage for the ship operating on international trade. So, space optimization restricts possibilities to easily install new equipment on board.
- Natural constraints, which limit ships' operations during winter period, divide ships in two main classes: river-ship and river-sea ships. While the first class of ship cannot operate during canal freezing, the second class, more particularly with the recent units, has the ability to trade in European water when the river system freezes. Therefore, in spite of higher costs, new building programs foster modern river-sea ships able to operate anywhere.
- Ship age is another important factor to consider. Numerous vessels built between the 1960s-1980s still navigate. Owners of old ships may be reluctant to invest in BW system because these vessels are reaching their end of operational life. On the other hand, the whole fleet is under renewal. So, the next generation, which will probably have the capacity to operate outside

- national waters, will have to comply with the international regulatory regime, including the upcoming BWMC.
- The inland waterway system has always been a key component of the Russian and regional transportation network. The majority of ships are operated under the Russian Federation (RF) flag and interest. Additionally, as an active shipbuilding industry with the capability to design ships particularly adapted to the regional constraints, the industry in the region possesses the capacity to construct, repair, modify and retrofit ships as well as install new equipment and piping systems. So, ship modification or equipment fitting can be conducted in the area.

Identified as the main source of BW transfer, cargo ships demonstrate various BW practices and release patterns.

Tanker ships and general cargo ships represent the vast majority of ships transiting between Black Sea and Caspian Sea. Some other types of cargo ships transit in the region including bulk carriers. However, the study does not consider special ships like icebreaker, tugs dredge or passenger ships.

It is particularly important to focus on tankers and bulk carriers because such ships usually proceed to loading their ports without cargo but “on ballast”. So, to transit safely when empty, these ships must carry large amount of BW in their tanks, which will be released at their destination.

General cargo ship, container ships and other ships’ types usually load and discharge smaller quantities of BW on a regular basis in order to compensate weight distribution on board.

Ballast movements: main trends

Present regulatory framework in the RF requires ship to exchange BW 14 km before entering Azov-Don Sea Canal and outer Astrakhan Road. In the Caspian Sea side, a prescribed area is designated and for vessels unable to complete their exchange, they expect to discharge BW into an onshore facility or specialized vessel. However, BW exchange as a method to manage BW remains unsatisfactory for numerous reasons, *inter alia*, un-pumpable volumes, sediment contamination, ship safety, time and energy, etc. In short, this method is particularly uncertain in achieving efficient IAS risk control and raises serious safety concerns. Moreover, according to the study, it seems that some ships are recording BW operations, which has never been.

Port State Control officers appear to restrict their control to documents and do not take indicative sample to verify BW compliance. Only in cases of established biohazard do Port Sanitary Inspectors conduct detailed analysis.

To assess volumes and patterns of BW transiting the area, researchers developed a voluntary Ballast Water Reporting Form (BWRF). This tool offers the possibility to gather, monitor, track, and analyze BW movement in the region. Despite some inconstancies due to input errors or misunderstanding, data collected underpinned the estimated of BW movement in the region. By showing broad trends, data collection fosters the identification of highly vulnerable areas, which require

enhanced attention. It also constitutes a learning process of present BW practices and to advance management or control options.

The BWRf analysis revealed relevant information. First, approximately 10% of ships undertake BW movements during the transit. So, an adequate BW adjustment before transiting should avoid mixing of water and contamination during navigation if no cargo operation occurs during the transit. Second, the main threat has been identified for Caspian Sea. Numerous vessels navigate on ballast eastward in order to load in the region. At their destination, ships release large quantities of BW during cargo operations, which constitute a high risk of contamination to the local environment. Few ships only transit westward with large amounts of BW.

The study concluded that 81% of total BW transiting in the region reaches the Caspian Sea while 10% proceeding westwards and the rest northward and southward.

The oil trade largely influences this tendency. Despite the multiplication and recent opening of pipelines connections westward, the flexibility of shipping combined with the increase of regional oil and gas production should keep tankers as non-negligible vehicles of Caspian hydrocarbon trade.

In short, key features influencing ships' BWM:

- Age of ships may refrain costly investment in BW Treatment systems;
- Restricted available volumes on board for non-cargo spaces;
- Restricted underkeel clearance leads to uptake of turbid water full of sediments, which accumulates inside BW tanks and may impact BW treatment system options;
- New generation of river-sea ship will need to comply with BWMC in order to participate to international trade during winter season;
- Ship design expertise and shipyard capacities available in the region.

In short, BW movements in the area:

- Most BW moves eastward which represents high risks for the Caspian Sea;
- Tanker ships carry large volumes of BW;
- Ballast water exchange options lack of efficient and reliability;
- Present compliance monitoring and enforcement require enhancement.

BW management options

Objectives of this part

As previously detailed, ballast water moves species from one location to another. This transfer of organisms may cause deleterious impacts on the recipient region. Because the present world fleet cannot be operated with BW to safeguard ships' integrity, the solution to avoid the transfer of Harmful Aquatic Organisms and Pathogens is the management of BW. This management aims to process the water and eradicate its biological risks. The management of the BW on board ships is the core of the BWM Convention. The Convention defines two options: exchange (D-1)

and release standard to achieve (D-2). While the first possibility is an interim solution, the second option constitutes the main solution. To achieve D-2 Standard, the treatment solution is left to system manufacturers. Consequently, numerous systems have been developed around the world. While some of them already operate, others follow the approval process required by the Convention and its guidelines (G8 & G9).

Despite being the main trend, onboard treatment system plant is not the only solution. Indeed, the Convention (B-3.6) and its guideline G5 suggest an alternative proposition: shore base facilities able to collect untreated BW and to provide “clean” or managed water.

The study ranked the various options according to regional specificities. The present available onboard treatment systems are reviewed as well as the shore based solution.

Ship-based option

The world tendency is towards shipboard installations. Three main reasons explain this tendency:

- The Rio principle: “polluter pays”;
- Flexibility of operation when having an onboard system;
- Difficulties to develop onshore treatment system in ports or terminals (politics, finances-costs, spaces, geography, piping systems, etc.).

Onboard solutions require all ships to be equipped regardless of their age and investment costs. In this respect shore based system could represent a smaller number of system to install worldwide and may be a better option in some regions.

Today, 66 systems have been developed or are under development. 36 systems have their G8 approval and among them two possess the double G8-USCG/ETV approval. Two systems have seen their final approval withdrawn due to lack of performance related to real ship operation diversity.

Three main processes categorize the BW treatment systems: mechanical, physical, and chemical. Often, the BWM systems cumulate processes to enhance biological efficiency.

Three processes dominate the market: filtration (screen or disc), Ultra Violet and electrolyze:

- The mechanical filtration hinders particulates larger than 25-50 μm to penetrate the system. It forms barriers to large organisms. But despite backwash systems, the filters impact the BW flow rate which may disturb upload and discharge of BW particularly in areas of high turbidity.
- Ultra Violet (UV) affects organisms’ DNA. Consequently, organisms are destroyed or inactivated. The UV systems require high energy and their efficiency depends on water conditions and quality.
- Electrolyze generates hypochlorite which have biocide effects. No chemical injection is required but energy and water containing sufficient ions are a

must. Efficient in sea water, such systems seriously declines in freshwater. In addition, the biocide must be neutralized before the discharge of the BW in the seas to avoid detrimental effects on environment.

The researchers established a matrix to evaluate each technology as well as shore-based facility as one of them. Sixteen factors are reviewed. The factors relate to the ships constraints as well as the water system conditions. The result of this analysis presents a ranking of the various technologies. Fig.4 presents an extract of this ranking focusing on the top systems.

BW Management Option	% of Maximum Score	Preliminary Ranking
Land-based reception facility	88.5%	1
Injection of a non-oxidising biocide (such as <i>SeaKleen</i> [®])	84.6%	2
Cavitation / shear force mixing	80.8%	3
Mechanical filters (self-cleaning screen or disc filters)	80.8%	3
Medium pressure UV units	80.8%	3

Fig. 4: Summary outcome of the preliminary ranking exercise (Hilliard & Kazansky, 2006)

Since the study, other systems and tests have been developed and a new analysis would probably have different results for the classification of the onboard system. However, according to the region and fleet specificities, the land-based reception facility would likely remain at the top position because this solution presents the unique opportunity to virtually re-isolated the Caspian Sea from the BW originated from Black Sea.

Land-based option

In order to address the issue, the study proposes to envisage the creation of a land-based facility able to capture the high risk BW before the ships penetrate the Tsymlyanskoye Water Reservoir and enter the Volga-Caspian water system.

In addition to establishing a clear barrier between both seas, the land-based option presents other interesting advantages:

- BW transiting can be fully controlled/renewed by the establishment of a clear barrier. The precise BW management location has to be determined but should be before the locks;
- BW management does not depend on ships and the equipment variability. Dedicated equipment with water treatment expert teams would offer a secured system;
- Ships in the area do not need to invest in large BWM system which can be difficult or unpractical to install and operate;
- Shipyards can provide piping modification as well as a common connection equivalent to what already exist in oil industry or for fire main system.

The shore-based facility was the preferred option for the 2006 study. Despite the BW Treatment system evolution, this solution still makes sense today because of the specificities of the region and its fleet.

3. Conclusion

While transfer of species from one location to another has always existed, the magnitude, rhythm, speed, distance and volumes of such transfers have never been as high as today. They are directly related to human activities and transportation systems. In the Black Sea/Caspian Sea region, the man-made connection of separated systems created a novel situation in terms of invasions. The integration of the Caspian Sea in the world shipping network through the Black Sea and Baltic Sea modifies the situation of this former isolated sea. Directly opened to ecosystems, which may be harmful for the ecosystem, the Caspian Sea is at risk. Its unique rich commercial resources ecosystem is particularly vulnerable position and requires prompt actions from the regional partners to preserve it.

While the end of the trade is not an option, the strict implementation of BW management solution remains a must. It is an urgent matter because this sea sees its resilience impacted years after years by continuous invasions mostly transiting through the Black Sea and the Sea of Azov. The solution proposed in the 2006 study remains an option to consider because it creates barriers and re-isolated the Caspian Sea from the Black Sea threats.

Annex 7 – Concept Note: on a possible inter-regional Black Sea-Caspian GEF project (Dr. Yegor Volovik)

1. Introduction

There have been a number of activities implemented in the Black and Caspian seas related to Ballast Water Management (BWM) and prevention of introduction of invasive species (GloBallast, CaspEco, etc.). This is why it is believed that another proposal on neither invasive species nor on BWM would be supported by the GEF. However, the GEF might be interested in a project, which would encompass the Black and Caspian seas together. Such an inter-regional project (further in text - the Project) would have the following features:

- Currently, the threat of invasion of alien aquatic organisms remains high in the entire geographical area covering the Black and Caspian seas¹. This threat extends far beyond the Black and Caspian seas region only because of the connection to the Mediterranean through the Bosphorus and Dardanelle straights in the south-west and to the Baltic Sea through the Volga-Baltic waterway in the north. Addressing the issue of uncontrolled invasion at the earliest time possible would certainly represent global benefits.
- The Project would represent a unique set up. It would include in the focus area of 10 countries.
 - The Black Sea - Bulgaria, Georgia, Romania, Russia, Ukraine and Turkey;
 - The Caspian Sea - Azerbaijan, Iran, Kazakhstan, Russia, Turkmenistan.
- Overall, the following specificities could be emphasised:
 - The Russian Federation - The Volga-Don River Canal (internal waterway within Russia) and Volga-Baltic River Canal (this will be used mainly as boundary conditions for the Project)².
 - The Bucharest and Teheran Conventions and corresponding Secretariats constitute the required regional legal framework and institutional platforms for cooperation within the Project.
 - The Project would allow establishing an effective inter-regional coordination mechanism, which could in future serve much wider cooperation than just on invasive species and BWM related activities. Experience of such cooperation exists in the region. For instance, a Black Sea - Danube Working Group established by a MoU between the Danube and Bucharest Commissions on the establishment of a joint monitoring system and reporting.
These specific features of the future Project could be a good argument in discussions with both the countries and GEFSEC.

¹ According to Dr. T. Shiganova, IMO Consultant (see a separate paper).

² It is believed that Volga-Baltic River Canal should not be directly addressed within the Project to insure a more focused interventions, which would mainly concentrate its activities on the Black and Caspian Seas.

- At the moment three of the ten countries concerned have already ratified the BWM Convention³ (further in the text - the Convention). Other countries of both basins are in the process of ratification. If the Convention enters into force before the countries are jointly prepared to meet the requirements and obligations under the Convention, this could disturb the current level of trade and cooperation in the region. For instance, according to country representatives⁴ a large number of ships from Azerbaijan would not be able to enter territorial waters of the Russian Federation.
- The countries explicitly expressed that such an inter-regional Project is highly relevant and they would support such a project both within the countries and at international level.
- Role of Russia in this Project would be critical, since the Project could only be successful if Russia is fully engaged and bought-in into the project starting from the earliest stages:
 - The Russian Federation has ratified the Convention, and at the moment if it enters into force Russia will have to follow all obligations under the Convention.
 - Both Volga-Don and Volga-Baltic canals go through the territory of internal jurisdiction of Russia.
 - The above canals connect the Black and Caspian seas to the ocean through 3 seas: the Black Sea, the Baltic Sea and the Caspian Sea.

A possible structure for the Project is shown below:

³ Russia, Iran, and Turkey.

⁴ Expressed at an inter-regional meeting of the Black Sea and Caspian countries in Novorossiysk on 12-13 Dec 2013.

Component 1: Systems of monitoring, data collection, storage and reporting	<ul style="list-style-type: none"> • Focuses on inventories of the existing systems of monitoring, data/information collection, processing and reporting. Individual systems in each of the countries concerned need to be analysed as per requirements and recommendations of the Convention. Gaps are to be identified and recommendation prepared to bridge these gaps in the context of the inter-regional cooperation being established. Could be piloted within Component 3.
Component 2: Institutional arrangements required to support inter-regional cooperation on BWM and prevention of introduction of alien to the basins species	<ul style="list-style-type: none"> • Focuses on legal and institutional arrangements required to formalise the inter-regional cooperation. Legal basis for such cooperation would be formed by the Bucharest and Tehran Conventions. However, a number of additional adjustments required at the inter-regional level. There are a number of possible options to be evaluated and the chosen ones to be set up within the Project activities.
Component 3: Targeted research, assessments, studies, and pilot activities directly related to BWM	<ul style="list-style-type: none"> • Focuses on targeted (e.g. risk assessments), studies (e.g. feasibility studies), and pilot activities directly related to invasive species and BWM. Pilots could also cover alternative technical solutions and management options to be developed to minimise risks of further invasion.
Component 4: Mainstreaming of BWM measures into national legal and regulatory systems of the countries	<ul style="list-style-type: none"> • Focuses on the analysis and recommendations to mainstream measures to be proposed within the Project into the existing national legal and regulatory systems. An inter-sectoral approach would allow to ensure improvements/strengthening of inter-ministerial coordination mechanisms in each of the countries concerned.
Component 5: Financial mechanisms and economic instruments required to effectively implement the BWM Convention	<ul style="list-style-type: none"> • Focuses on the optimisation of existing and developing and testing (within Component 3) of alternative financial mechanisms and economic instruments (including innovative). Measures proposed could also represent risk transfer measures (e.g. new insurance schemes, etc.).
Component 6: Capacity building, public awareness, and knowledge management	<ul style="list-style-type: none"> • A cross-cutting set of activities to support all dimensions of the project. A Capacity Development strategy to be developed will concentrate on strengthening of capacity in BWM of the key groups of government stakeholders and wider public (including NGOs). In addition, a system of data/info exchange and/or a web-based knowledge management platform supported inter-regionally will provide a technical means of cooperation.

A more detailed discussion on each of the aforementioned components is presented below.

2. Improvement of monitoring, data collection, storage and reporting

All countries concerned have their own systems of monitoring, data collection/assessment, and reporting. The Convention represents the need to harmonise these systems basin-wide, and in the case of the Black and Caspian seas together – inter-regionally. At an inter-regional meeting held in Novorossiysk on 12-13 December 2013, the countries emphasised the need for a harmonised approach to data/information collection and processing. A number of studies implemented so far can form a good basis for a regional assessment; however, they had not been fine-tuned to the information needs of the risk assessments required at both national and regional levels in accordance with the BMW Convention.

It was proposed at the inter-regional meeting to organise joint monitoring survey(s) with participation of all countries. Such surveys could serve two purposes: (1) to harmonise methods, parameters and corresponding sampling techniques and sample analysis, and (2) to provide a snap-shot of the current situation with the key invasive species. A common list of invasive species of regional importance could also be a target of the future Black Sea - Caspian Inter-

Regional Monitoring System (BCIRMS). Such a system could be firmly embedded in the current monitoring efforts of the countries within their territorial waters. Experience in the development of such systems exists in the region, e.g. the Black Sea Integrated Monitoring and Assessment Programme (BSIMAP) and Trans-National Monitoring System (TNMS) for the Danube River.

The development of such a system would require the development of unified database formats (e.g. ships, species, vectors, port facilities, etc.). Coordination of the Black Sea and Caspian sectors of BCIRMS will be coordinated by the Secretariats of the Bucharest and Teheran Conventions.

Cooperation modalities between the Secretariats will be further discussed below.

3. Institutional arrangements to support inter-regional cooperation

Currently, cooperation between the two Secretariats on BWM and prevention of introduction of alien species to the basins is formalised through the exchanged letters of intentions. This serves as a good start for an intensified cooperation between the two regions. Modalities of such cooperation could vary a great deal. During the Project, this inter-regional cooperation needs to be institutionalised and strengthened. It is far too early to give the exact format of a joint institutional cooperation platform as it should include not only inter-regional but also regional and national inter-sectoral dimensions. Structure of such a platform will be prepared and agreed upon during the Project. For instance, it could be one of the following:

1. A joint Task-Force (TF) established by a MoU between the Secretariats. The TF would meet on a regular basis, say, twice a year, to develop and further report on joint activities.
2. A virtual platform - inter-regional meeting/conference/sessions organised on a rotational basis by the participating countries. Secretariats of both Conventions could play coordination role and support logistically activities between the sessions.
3. Establish the inter-regional working group(s) under TF to support participation of national experts (a network could be set up within Component 6).

Whatever format of cooperation will be proposed after a detailed analysis, the joint TF could be responsible for the following inter-regional activities:


- Organisation of regular meetings to discuss issues of inter-regional nature. These meetings could also include reporting sessions and development of joint plans of actions;
- Reporting needs to be harmonised. Reporting and data exchange protocols to be developed will be based on IMO format and on the Convention;
- Supporting of BCIRMS, also in providing guidance for research to be carried out by individual institutions in each of the countries;
- Coordination of inter-regional studies and assessments (e.g. risk assessments within Component 3);
- Development of joint inter-regional reports and publication, also on a regular basis (e.g. a quarterly bulletin with presentation of results of invasive species monitoring);
- Harmonisation of capacity building activities and training across both regions;

- Supporting development of exceptions for ships both within Black Sea and Caspian individually and in inter-regional perspective;
- Establishment and supporting activities of a network of experts in related fields of expertise;
- Development of supporting operation of an inter-regional Knowledge Management Platform (KMP);
- Other tasks as required.

Activities above need to be implemented based on a TF workplan agreed on by the participating countries. If needed, specialised advisory groups (permanent or *ad-hoc*) could be established.

The table below helps to understand the level of national stakeholder involvement in the Project:

Stakeholders	BG	GE	RO	UA	TR	RU	AZ	IR	KZ	TM
Relevant Ministries										
GEF Operational FP										
GEF Political FP										
Ministry of Environment										
Ministry of Transport										
Other relevant ministries										
Academia										
University 1										
Research Institute 2										
Other academia ...										
NGO and Wider Public										
NGOs										
Wider Public										



HELCOM countries

4. Targeted research, assessments, studies, and pilot activities

Activities under this Component would include all inventories, assessments, studies and pilot activities to be implemented within the Project. Despite the fact that during previous interventions in the Black and Caspian Seas basins a number of studies and risk assessments have been completed, participants of the meeting in Novorossiysk pointed out that these studies need to cover the entire Black Sea - Caspian region. Risks of further introduction of invasive species are to be identified region-wide and take into account all countries concerned. It is impossible to develop an effective BWM system without all countries participating in the assessment. In addition, measures taken by some countries of the region will be much less effective if implemented by countries in isolation from others, since all key sources of invasion/introduction of alien species need to be addressed regardless of a country the source is located in order to ensure the effectiveness of BWM measures. This is why, a close cooperation at inter-regional level is paramount in the prioritisation exercise.

A suite of assessments and studies need to be prepared at later stages of Project development after close consultations with the countries. A tentative initial list would include the following:

- Risk assessment (as per requirements of the BWM Convention);
- Existing ways of introduction of different invasive species⁵;
- Identification of alternative management options for BWM in the Black and Caspian seas;
- Identification of modern or development of new technical solutions to BWM;
- Feasibility studies on the measures developed within other Components of the Project:
 - Exemption certificates under the Convention within the Black Sea, Caspian Sea and also between the Black and Caspian Seas,
 - Location of reception facilities for ballast water;
- Joint monitoring survey(s) (see Component 1), which would help to harmonise sampling and processing techniques, and also to provide a snap-shot along the survey(s) route;
- Other studies as required and identified during consultations with the countries.

Each of the studies would form lists of information and data to support such measures effectively across the entire region. The studies above need to be informed by and correspond to the Road Map and Strategy within implementation of the Convention.

Experience in conducting similar risk assessment exists in the region. A number of assessments were implemented for the Black Sea within the GloBallast Project (2004-2007). This experience needs to be extended to the Caspian basin. Such assessments need to address each port. The meeting representatives proposed to work more on identification of location of uptake and discharge of ballast water. In addition, identification of special (riverine or marine) zones designated for the release and exchange of ballast water with the high risk of toxicity needs to be undertaken.

5. Mainstreaming of BWM measures into national legal and regulatory systems

During the inter-regional meeting in Novorossiysk, the country representatives underlined the need of required amendments to a number of national legal and regulatory documents. This will be needed to effectively introduce required improvements and implement the Convention in the Black and Caspian Sea regions. A detailed analysis of the existing gaps is proposed to be implemented during earlier stages of the Project and required adjustments identified. Since timing of implementing legal and regulatory reforms in each of the countries usually takes much longer than any project's duration, the Project is to start these activities at the earliest stages of the Project in order to expedite the process of ratification and implementation of the Convention for the countries of the Black-Caspian region.

In addition, participants of the meeting recommended the following activities:

⁵ IMO Consultants participating in the meeting in Novorossiysk have already presented results of such studies.

- Development of unified approaches and recommendations over control of ballast water at Port States of the Black and Caspian Seas Region;
- Development of a common approach to the administrative and prevention measures, in the case of non-compliance the Port-State requirements by the ship's administration.

6. Financial mechanisms and economic instruments to effectively implement the BWM Convention

Since reforms required in the countries, financial mechanisms and economic instruments form an indispensable part of the governance systems to implement the Convention. Risk reduction and transfer measures, like innovative insurance schemes, can add to the management options available at the moment. To implement those, Public-Private Partnerships (PPPs) in this area needs to be established or strengthened if they exist. Also, innovative financial instruments and mechanisms need to be identified, developed, tested (within Component 3) and introduced, as part of Project interventions at the national level, to finance BWM activities at all scales (inter-regional, national, sub-national, and local) in the short- and long-term. Financing options will, during this process, be expanded and realigned from current practices to meet national costs and will complement resources emerging through donor assistance programmes and other channels. Capacity to design and implement financing options (being a part of management options) will be developed to ensure sustainability of innovative financing at all levels. It is critical that activities under this Component are coordinated regionally, however, the countries with better enabling environment could be focused on first. Implementation of innovative financing mechanism in one or more countries, and then replication and up-scaling of the schemes region-wide could help to form a longer term strategy of financing-related measures across the entire region.

However, development and implementation of innovative financing schemes require full buy-in from the country(ies) concerned. This is why the corresponding discussions need to be carried out with the countries during further negotiations on the Project. If the countries do not fully support such a reform, having this as a separate Component can put the entire Project at risk. In this case, some activities related to innovative financing schemes could be included into other Components (e.g. Component 3 or 4).

7. Capacity building, public awareness, and knowledge management

As indicated at the meeting, there is limited knowledge of the BWM Convention among key decision-makers and other stakeholders, particularly of roles to be played by each party after it enters into force. The cross-sectoral nature of the impacts of inadequate BWM, and, consequently, preventive measures to address uncontrolled introduction of alien species and potential management options have to be well understood by the main players within key stakeholders at national and sub-national levels.

Despite the fact that information is collected and various databases exist in all Black Sea and Caspian countries, their compatibility and correspondence with the requirements of the Convention (i.e. IMO format) is questionable. Separate efforts are required to analyse the current

state of data collection, information fluxes within the countries, and reporting protocols both nationally and internationally. Such efforts could result in the development of common database formats (recommended to be based on the IMO format).

Further, activities under this Component could also include the following:

- Data exchange protocols, adoption of common Ballast Water Reporting Forms (BWRF);
- Establishment and maintenance of the common information center or portal for surveillance and management of ballast water (this can also have national segments);
- PSC inspectors - training across the entire region;
- Establishment (and formalisation?) of a network of experts;
- Involvement of private sector and public-private partnerships;
- Web-based knowledge management platform.

8. General discussions and conclusions

To summarise, the following general points need to be made: the countries of both the Black Sea and Caspian are fully supportive of the idea of a new inter-regional project, particularly, in light of the implementation of the BWM Convention, however:

- More detailed consultations are required in the countries with a particular focus on inter-ministerial nature of activities;
- A number of systems to support management decisions exist in the region but their composition, technical realisation and maintenance are not clear at the moment. The need to harmonise efforts in bringing those systems together is quite clear;
- The countries of the Black Sea - Caspian region have various level of advancement in terms of moving towards full implementation of the Convention. The most advanced countries and those which have already ratified the Convention, could be used as platforms to strengthen the capacity of the less advanced countries;
- The scope of the future Project needs to be discussed with the countries and GEFSEC. Activities included in this paper could form a basis of a project of any scale. However, it is believed that a Medium-size project will not be enough to cover such a geographically vast region.