

Subject

Introduction to the Outcomes of MEPC63

ClassNK

Technical Information

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To whom it may concern

A summary of the decisions taken at the sixty-third session of the Marine Environment Protection Committee (MEPC 63) held from 27 February 2012 to 2 March 2012 is provided below for your information.

1. Mandatory requirements adopted

Key mandatory requirements adopted during this session are summarized below.

(1) Amendments to MARPOL Annexes relating to Small Islands Developing States (Attachment 1)

Amendments to MARPOL Annexes I, II, IV, V, and VI were adopted, aimed at enabling Small Islands Developing States*¹ to comply with requirements regarding reception facilities for ship waste through regional arrangements.

The amendments are expected to enter into force on 1 August 2013.

Note*1: Refers to small island states in the Pacific, the West Indies, the Indian Ocean, and elsewhere that are considered to have difficulty in continuous development due to scarce population and resources.

(2) Amendments to NOx Technical Code enabling separate certification of SCR and diesel engine (Attachment 2)

MARPOL Annex VI requires ships with keels laid after 1 January 2016 to comply with the NOx Tier III regulations in the Emission Control Areas (ECA). Amendments were adopted to the NOx Technical Code permitting separate certification of the diesel engine and the Selective Catalytic Reduction (SCR) System, a technology that makes it possible to comply with the above Tier III requirements.

The amendments are expected to enter into force on 1 August 2013.

(To be continued)

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2. Ballast Water Management Convention

Adopted in 2004, the Ballast Water Management Convention will enter into force 12 months after ratification by 30 states, representing thirty-five percent (35%) of the aggregate global merchant shipping tonnage. As of the end of May 2012, it has not come into effect with ratification of thirty three (35) countries, representing 27.95% of the world's merchant shipping tonnage.

Ballast Water Management Systems specified in the said convention should be type approved by the Administration based on IMO Guidelines. In cases where "active substances" are used to sterilize harmful aquatic organisms and pathogens, the approval of the active substances itself by the IMO (Basic Approval) and the comprehensive approval of the systems by the IMO (Final Approval) are needed prior to the type approval by the Administration.

(1) Approval of Ballast Water Management Systems using active substances

During this session, three basic approvals and six final approvals were granted to Ballast Water Management Systems using active substances. Consequently, the number of systems given final approval by the IMO has reached twenty-six in total.

At the moment, the number of systems that can be actually installed onboard ship, i.e. which have been type approved by the Administration, amounts to twenty-two, including systems not using active substances (Attachment 3).

(2) Assessment of impact of entry into force of Ballast Water Management Convention

The Ballast Water Management Convention requires ships of over 400 GT to undergo surveys and carry required certifications onboard. In addition, all ships are required to carry an approved Ballast Water Management Plan (hereinafter referred to as the "Management Plan") and a Ballast Water record book onboard, as well.

Ships constructed before the convention comes into effect are to be equipped with a Management Plan in conjunction with the entry into force, since the stepwise implementation of the survey and issuance of certifications is not allowed. Also the installation of an approved Ballast Water Management System is required by the first intermediate survey or renewal survey after the Convention enters into force.

At this session, IACS and the International Chamber of Shipping (ICS), amongst others, submitted a document that raised questions about the feasibility of the said requirements and countermeasures were discussed. As a result, a number of countries have supported the establishment of a framework enabling the issuance of certificates even before the Convention enters into force. Discussions will continue this matter.

(3) Validity of Ballast Water Management Plans

In anticipation of the adoption of Ballast Water Management Convention, many classification societies have already begun to offer Ballast Water Management Plan approval services in accordance with IMO Resolution A.868(20) "Guidelines for control and management of ships' ballast water to minimize the transfer of harmful aquatic organisms and pathogens". On the other hand, Ballast Water Management Plans have also been approved in accordance with Resolution MEPC.127(53) (G4 Guideline) after was adopted.

At this session, discussions took place on the handling of Management Plans approved in accordance with the previous resolutions (A.868(20)). Consequently, it was confirmed that those Management Plans are also valid.

(To be continued)

(4) Review of the availability of the ballast water management technology

At MEPC 62, the Committee agreed that a review of the availability of the ballast water management technology should be conducted within 12 months after the Convention achieves its ratification requirements for entering into force.

At this session, Japan provided documents on the current installation status of ballast water management systems and proposed that an appropriate review, as noted above, should be conducted based on the understanding that the ballast water management systems are not smoothly installed. As a result, it was agreed to put forward the collection and analysis of the data collected from Member States based on the proposal of Japan.

3. Ship Recycling Convention

Adopted in May 2009, Ship Recycling Convention will enter into force 24 months after ratification by 15 countries, representing 40% of the world's merchant shipping tonnage, and their combined maximum annual ship recycling volume exceeds 3% of their combined merchant shipping tonnage. As of the end of February 2012, five countries (France, Italy, the Netherlands, Turkey, and Saint Kitts and Nevis) have expressed (signed) that they are preparing to ratify the convention, while the actual ratification has not been achieved.

Currently, the IMO is developing necessary guidelines for the implementation of the convention. At this session, the guidelines relating to ship recycling facilities were discussed.

(1) Examination of details of guidelines for ship recycling facilities

At this session, four draft guidelines including "Guidelines for safe and environmentally sound ship recycling" and "Guidelines for the authorization of ship recycling facilities" were discussed. The results are as follows:

- (i) "Guidelines for safe and environmentally sound ship recycling": Adopted
- (ii) "Guidelines for the authorization of ship recycling facilities": Adopted
- (iii) "Guidelines for survey and certification": Ongoing
- (iv) "Guidelines for PSC": Ongoing

The draft guidelines of items (iii) and (iv) above will be discussed by the correspondence group and submitted to MEPC 64.

4. Greenhouse Gases (GHG)

Kyoto Protocol, a protocol to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at the global reduction of greenhouse gas (GHG) emissions, excludes ocean going vessels from its scope and stipulates that the IMO should examine the countermeasures to be taken to reduce GHG emissions from international shipping.

At its previous session (MEPC 62), the MEPC adopted amendments to MARPOL Annex VI that make the Energy Efficiency Design Index (EEDI) and the Ship Energy Efficiency Management Plan (SEEMP) mandatory. In addition, guidelines necessary for the implementation of the regulations were discussed and finalized at the second intercessional meeting of the Working Group on Energy Efficiency Measures for Ships (EE-WG2) which was held in January 2012.

At this session (MEPC 63), in addition to discussions on the adoption of those guidelines, discussions were also held on the introduction of market based measures (MBM) to further reduce GHG emissions from international shipping.

(To be continued)

(1) Examination of each Guideline

The following four guidelines, finalized at EE-WG2, were adopted at this session.

- (i) Guidelines on the calculation of the EEDI
- (ii) Guidelines on the survey and certification of the EEDI
- (iii) Guidelines on the development of a SEEMP
- (iv) Guidelines on the calculation of the reference line for the EEDI

In accordance with the implementation of the EEDI, "Guidelines for determining minimum propulsive propulsion power", aimed at maintaining manoeuvrability of the ship under adverse conditions, will be discussed at MEPC64.

(2) Unified interpretations relating to GHG regulations

(i) Major Conversion

Regulation 2.24 of the amended MARPOL Annex VI stipulates the definition of the "Major Conversion" of ships.

The interpretation of "Major Conversion" was also discussed at the session. Consequently, the interpretation proposed by IACS that "Major Conversion" includes conversions that result in the life extension of ships, changes in the size of ships or in the capacity of main engine output, or an increase in the EEDI was supported and to be taken under the further consideration.

(ii) Validity of the International Air Pollution Prevention Certificate (IAPP Certificate)

The amended MARPOL Annex VI requires ships to carry an International Energy Efficiency Certificate (IEE Certificate) in addition to an International Air Pollution Prevention Certificate (IAPP Certificate).

At this session, the case where the IEE Certificate could not be issued due to the inability to confirm the possession of the SEEMP, etc. was discussed. In this regard, the interpretation that the lack of the IEE Certificate does not affect the validity of the IAPP Certificate, proposed by IACS, was supported by the committee. MEPC requested IACS to submit the draft unified interpretation to MEPC 64.

(3) Market Based Measures

IMO is working on Market Based Measures (MBM), such as the introduction of special bunker levies and emissions trading schemes, etc., to supplement the technical and operational measures for achieving the GHG emission reductions required by the amended MARPOL Annex VI.

The Secretary General of the IMO expressed his strong intention to complete the examination of Market Based Measures at the IMO by 2015 in his keynote speech at the start of this session.

In order to narrow down the number of Market Based Measures proposed by member states, the Chairman of the MEPC suggested carrying out assessments of the impact of such measures on developing countries with respect to the implementation of these measures. The MEPC agreed to consider further the items to be investigated and methods of such assessments.

(To be continued)

5. Guideline on implementation of MARPOL Annex V (Control of Pollution by Garbage from Ship) MEPC 62 adopted amendments to MARPOL Annex V (Control of Pollution by Garbage from Ship) which are expected to enter into force on 1 January 2013. The amendments allow cargo residues "only when the garbage does not include any substances harmful to the marine environment in accordance with the guidelines", which are under on-going discussions.

At this session, the MEPC adopted guidelines that include "acute and chronic aquatic toxicity, toxicity harmful to health in the long term, such as carcinogenicity, mutagenicity, etc. and plastics" into the harmful garbage from cargo tanks.

It was pointed out that toxicity harmful to health in the long term is difficult to evaluate in a short time, and MEPC 63 agreed to discuss the draft circular and postpone the applicable dates for the said material at the next session.

6. Discussions on IOPP and IAPP Certificates

- (1) Supplement to IOPP Certificates

The capacity of incinerators installed onboard ship is to be described in item 3.2.1 of the supplement to the International Oil Pollution Prevention Certificate (IOPP Certificate) as "l/h". However, MEPC 59, which was held in 2009, adopted amendments to MARPOL Annex I which state that capacity should be described as "kW" or "kcal/h".

On the other hand, the format of the type approval certificate for incinerators requires capacity to be described in terms of "kW or kcal/h" or "kg/h".

IACS noted that the above different units often cause confusion among seafarers. Similar concerns were also raised by member states. Consequently, the Committee, recognizing that the proposal by IACS would entail an amendment to MARPOL Annex VI, decided not to pursue this matter further unless a proposal for an amendment to MARPOL Annex VI is received in the future.

- (2) Supplement to IAPP Certificates

There is a possibility to be interpreted that item 2.3 in the supplement to the International Air Pollution Prevention Certificate (IAPP Certificate) requires confirming that the fuel oil provided onboard at the time of issuance of the said certificate satisfies the specified value of sulfur content based on bunker delivery note and checking the applicable box, accordingly. However, at this session, IACS pointed out that while the sulfur restriction would be gradually strengthened, it is impossible to confirm the sulfur content restriction at the time of issuance of the certificate.

In this regard, IACS asked the MEPC for confirmation that the checkbox would be regarded as a declaration to use the prescribed fuel oil, which was supported by member states. Consequently, IACS will submit a draft unified interpretation to MEPC 64 on this matter.

(To be continued)

7. Draft amendments to MARPOL regarding Regulation 12.2.2 (sludge tank discharge piping)
- MEPC 62 found that the requirement that "the discharge piping of the sludge tank and that of bilge system can be led to a discharge facility via common piping" was unintentionally deleted during the revision of the amendments to MARPOL Annex I adopted at MEPC 59, which was held in July 2009. Accordingly, MEPC 62 issued a unified interpretation to clarify the above point as a temporary measure and requested IACS to submit further considerations and comments taking into consideration of the possible amendments to MARPOL Annex I to formalize the interpretation.
- At this session (MEPC 63), the MEPC discussed the draft amendments to MARPOL submitted by IACS in accordance with the request made at MEPC 62. However, since opinions were split on the applicable dates, the MEPC agreed to task the DE Subcommittee to consider this issue in detail.

A summary of the outcomes of MEPC 63 is also available on the IMO web-site (<http://www.imo.org>).

For any questions about the above, please contact:

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Attachment:

1. Amendments to MARPOL Annexes relating to Small Islands Developing States (Resolution MEPC.216(63))
2. Discharge requirements of sewage treatment in Special Area (Resolution MEPC.217(63))
3. Status of BWMS approval

ANNEX 20

**RESOLUTION MEPC.216(63)
Adopted on 2 March 2012**

**AMENDMENTS TO THE ANNEX OF THE PROTOCOL OF 1978 RELATING TO
THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF
POLLUTION FROM SHIPS, 1973**

**(Regional arrangements for port reception facilities under
MARPOL Annexes I, II, IV and V)**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution,

NOTING article 16 of the International Convention for the Prevention of Pollution from Ships, 1973 (hereinafter referred to as the "1973 Convention") and article VI of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973 (hereinafter referred to as the "1978 Protocol") which together specify the amendment procedure of the 1978 Protocol and confer upon the appropriate body of the Organization the function of considering and adopting amendments to the 1973 Convention, as modified by the 1978 Protocol (MARPOL 73/78),

HAVING CONSIDERED draft amendments to Annexes I, II, IV and V of MARPOL 73/78,

1. ADOPTS, in accordance with article 16(2)(d) of the 1973 Convention, the amendments to Annexes I, II, IV and V of MARPOL 73/78, the text of which is set out in the annex to the present resolution;
2. DETERMINES, in accordance with article 16(2)(f)(iii) of the 1973 Convention, that the amendments shall be deemed to have been accepted on 1 February 2013 unless, prior to that date, not less than one third of the Parties or Parties the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have communicated to the Organization their objection to the amendments;
3. INVITES the Parties to note that, in accordance with article 16(2)(g)(ii) of the 1973 Convention, the said amendments shall enter into force on 1 August 2013 upon their acceptance in accordance with paragraph 2 above;
4. REQUESTS the Secretary-General, in conformity with article 16(2)(e) of the 1973 Convention, to transmit to all Parties to MARPOL 73/78 certified copies of the present resolution and the text of the amendments contained in the annex;
5. REQUESTS FURTHER the Secretary-General to transmit to the Members of the Organization which are not Parties to MARPOL 73/78 copies of the present resolution and its annex.

ANNEX

AMENDMENTS TO MARPOL ANNEXES I, II, IV AND V

1 *New paragraphs 3bis and 4bis are added to regulation 38 of Annex I:*

3bis Small Island Developing States may satisfy the requirements in paragraphs 1 to 3 of this regulation through regional arrangements when, because of those States' unique circumstances, such arrangements are the only practical means to satisfy these requirements. Parties participating in a regional arrangement shall develop a Regional Reception Facilities Plan, taking into account the guidelines developed by the Organization.

The Government of each Party participating in the arrangement shall consult with the Organization, for circulation to the Parties of the present Convention:

- .1 how the Regional Reception Facilities Plan takes into account the Guidelines;
- .2 particulars of the identified Regional Ships Waste Reception Centres; and
- .3 particulars of those ports with only limited facilities.

4bis Small Island Developing States may satisfy the requirements in paragraph 4 of this regulation through regional arrangements when, because of those States' unique circumstances, such arrangements are the only practical means to satisfy these requirements. Parties participating in a regional arrangement shall develop a Regional Reception Facilities Plan, taking into account the guidelines developed by the Organization.

The Government of each Party participating in the arrangement shall consult with the Organization for circulation to the Parties of the present Convention:

- .1 how the Regional Reception Facilities Plan takes into account the Guidelines;
- .2 particulars of the identified Regional Ships Waste Reception Centres; and
- .3 particulars of those ports with only limited facilities.

2 *New paragraphs 2bis and 2ter are added to regulation 18 of Annex II:*

2bis Small Island Developing States may satisfy the requirements in paragraphs 1, 2 and 4 of this regulation through regional arrangements when, because of those States' unique circumstances, such arrangements are the only practical means to satisfy these requirements. Parties participating in a regional arrangement shall develop a Regional Reception Facilities Plan, taking into account the guidelines developed by the Organization.

The Government of each Party participating in the arrangement shall consult with the Organization for circulation to the Parties of the present Convention:

- .1 how the Regional Reception Facilities Plan takes into account the Guidelines;
- .2 particulars of the identified Regional Ships Waste Reception Centres; and
- .3 particulars of those ports with only limited facilities.

2ter Where regulation 13 of this annex requires a prewash and the Regional Reception Facility Plan is applicable to the port of unloading, the prewash and subsequent discharge to a reception facility shall be carried out as prescribed in regulation 13 of this annex or at a Regional Ship Waste Reception Centre specified in the applicable Regional Reception Facility Plan.

3 *New paragraph 1bis is added to regulation 12 of Annex IV:*

1bis Small Island Developing States may satisfy the requirements in paragraph 1 of this regulation through regional arrangements when, because of those States' unique circumstances, such arrangements are the only practical means to satisfy these requirements. Parties participating in a regional arrangement shall develop a Regional Reception Facilities Plan, taking into account the guidelines developed by the Organization.

The Government of each Party participating in the arrangement shall consult with the Organization for circulation to the Parties of the present Convention:

- .1 how the Regional Reception Facilities Plan takes into account the Guidelines;
- .2 particulars of the identified Regional Ships Waste Reception Centres; and
- .3 particulars of those ports with only limited facilities.

4 *New paragraph 2bis is added to regulation 8 of Annex V¹:*

2bis Small Island Developing States may satisfy the requirements in paragraphs 1 and 2.1 of this regulation through regional arrangements when, because of those States' unique circumstances, such arrangements are the only practical means to satisfy these requirements. Parties participating in a regional arrangement shall develop a Regional Reception Facilities Plan, taking into account the guidelines developed by the Organization.

The Government of each Party participating in the Arrangement shall consult with the Organization for circulation to the Parties of the present Convention:

- .1 how the Regional Reception Facilities Plan takes into account the Guidelines;
- .2 particulars of the identified Regional Ships Waste Reception Centres; and
- .3 particulars of those ports with only limited facilities.

¹ Text of revised Annex V, adopted by resolution MEPC.201(62).

ANNEX 21

**RESOLUTION MEPC.217(63)
Adopted on 2 March 2012**

**AMENDMENTS TO THE ANNEX OF THE PROTOCOL OF 1997 TO AMEND THE
INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM
SHIPS, 1973, AS MODIFIED BY THE PROTOCOL OF 1978 RELATING THERETO**

**(Regional arrangements for port reception facilities under MARPOL Annex VI and
Certification of marine diesel engines fitted with Selective Catalytic Reduction
systems under the NO_x Technical Code 2008)**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution,

NOTING article 16 of the International Convention for the Prevention of Pollution from Ships, 1973 (hereinafter referred to as the "1973 Convention"), article VI of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973 (hereinafter referred to as the "1978 Protocol") and article 4 of the Protocol of 1997 to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (hereinafter referred to as the "1997 Protocol"), which together specify the amendment procedure of the 1997 Protocol and confer upon the appropriate body of the Organization the function of considering and adopting amendments to the 1973 Convention, as modified by the 1978 and 1997 Protocols,

NOTING that, by the 1997 Protocol, Annex VI entitled Regulations for the Prevention of Air Pollution from Ships was added to the 1973 Convention (hereinafter referred to as "Annex VI"),

NOTING FURTHER regulation 13 of MARPOL Annex VI which makes the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (NO_x Technical Code) mandatory under that Annex,

NOTING ALSO that both the revised Annex VI adopted by resolution MEPC.176(58) and the NO_x Technical Code 2008 adopted by resolution MEPC.177(58) entered into force on 1 July 2010,

HAVING CONSIDERED draft amendments to the revised Annex VI and the NO_x Technical Code 2008,

1. ADOPTS, in accordance with article 16(2)(d) of the 1973 Convention, the amendments to Annex VI and the NO_x Technical Code 2008, the text of which is set out in the annex to the present resolution;
2. DETERMINES, in accordance with article 16(2)(f)(iii) of the 1973 Convention, that the amendments shall be deemed to have been accepted on 1 February 2013, unless prior to that date, not less than one third of the Parties or Parties the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have communicated to the Organization their objection to the amendments;

3. INVITES the Parties to note that, in accordance with article 16(2)(g)(ii) of the 1973 Convention, the said amendments shall enter into force on 1 August 2013 upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article 16(2)(e) of the 1973 Convention, to transmit to all Parties to the 1973 Convention, as modified by the 1978 and 1997 Protocols, certified copies of the present resolution and the text of the amendments contained in the annex;

5. REQUESTS FURTHER the Secretary-General to transmit to the Members of the Organization which are not Parties to the 1973 Convention, as modified by the 1978 and 1997 Protocols, copies of the present resolution and its annex.

ANNEX

AMENDMENTS TO MARPOL ANNEX VI AND THE NO_x TECHNICAL CODE 2008

Amendments to MARPOL Annex VI

1 *New paragraph 1bis is added to regulation 17:*

1bis Small Island Developing States may satisfy the requirements in paragraph 1 of this regulation through regional arrangements when, because of those States' unique circumstances, such arrangements are the only practical means to satisfy these requirements. Parties participating in a regional arrangement shall develop a Regional Reception Facilities Plan, taking into account the guidelines developed by the Organization.

The Government of each Party participating in the arrangement shall consult with the Organization for circulation to the Parties of the present Convention:

- .1 how the Regional Reception Facilities Plan takes into account the Guidelines;
- .2 particulars of the identified Regional Ships Waste Reception Centres; and
- .3 particulars of those ports with only limited facilities.

Amendments to the NO_x Technical Code 2008

2 *Existing paragraph 2.2.4 is replaced by the following:*

"2.2.4 *Engines not pre-certified on a test-bed*

- .1 There are engines which, due to their size, construction and delivery schedule, cannot be pre-certified on a test-bed. In such cases, the engine manufacturer, shipowner or shipbuilder shall make application to the Administration requesting an onboard test (see 2.1.2.2). The applicant must demonstrate to the Administration that the onboard test fully meets all of the requirements of a test-bed procedure as specified in chapter 5 of this Code. In no case shall an allowance be granted for possible deviations of measurements if an initial survey is carried out on board a ship without any valid pre-certification test. For engines undergoing an onboard certification test, in order to be issued with an EIAPP Certificate, the same procedures apply as if the engine had been pre-certified on a test-bed, subject to the limitations given in paragraph 2.2.4.2.
- .2 This pre-certification survey procedure may be accepted for an Individual Engine or for an Engine Group represented by the Parent Engine only, but it shall not be accepted for an Engine Family certification."

3 *Paragraph 2.2.5.1 is replaced by the following:*

- ".1 Where a NO_x-reducing device is to be included within the EIAPP certification, it must be recognized as a component of the engine, and its presence shall be recorded in the engine's Technical File. The engine shall be tested with the NO_x-reducing device fitted unless, due to technical and practical reasons, the combined testing is not appropriate and the procedures specified in paragraph 2.2.4.1 cannot be applied, subject to approval by the Administration. In the latter case, the applicable test procedure shall be performed and the combined engine/NO_x-reducing device shall be approved and pre-certified by the Administration taking into account guidelines developed by the Organization*. However, this pre-certification is subject to the limitations given in paragraph 2.2.4.2."

* Refer to the 2011 Guidelines addressing additional aspects to the NO_x Technical Code 2008 with regard to particular requirements related to marine diesel engines fitted with selective catalytic reduction (SCR) systems adopted by resolution MEPC.198(62).

Status of BWMS Approval

2012.03.09

BWMS Manufacture	BWMS Name	Country	Process	Approval of Active Substances G9		Approval of BWMS G8
				Basic Approval	Final Approval	Country
Alfa-Laval Tumba AG	PureBallast	Sweden	Filtration + UV/TiO2	Approved	Approved	Norway
Ocean Saver AS	OceanSaver	Norway	Filtration + Cavitation + Deoxygenation + Electrolysis	Approved	Approved	Norway
TECHCROSS INC	Electro-Clean	Korea	Electrolysis	Approved	Approved	Korea
Hitachi Plant Technologies, Ltd.	Clear Ballast	Japan	Pre-coagulant(enhanced flocculation)+ Filtration	Approved	Approved	Japan
Mitsui Engineering & Shipbuilding Co.,LTD.	FineBallast OZ	Japan	Filtration+ Ozonation + Cavitation	Approved	Approved	Japan
JFE Engineering Corporation	JFE Ballast Ace	Japan	Filtration+ Chlorination + venturi	Approved	Approved	Japan
RWO	CleanBallast (Ectosys)	Sweden	Filtration+Electrolysis	Approved	Approved	Germany
Resource Ballast Technologies Pty*	Resource Ballast Water Technologies System	South Africa	Cavitation+ Electrolysis + Ozonation + Filtration	Approved	Approved	South Africa
PANASIA CO., LTD.	GloEn-Patrol	Korea	Filtration + UV	Approved	Approved	Korea
NK CO., LTD.,	NK O3 Blue Ballast System	Korea	Ozonation	Approved	Approved	Korea
Hamworthy Greenship B.V.	Greenship's Sedinox Ballast Water Management System	Netherlands	Hydrocyclone + Electrolysis	Approved	Approved	
Ecochlor Inc.	Ecochlor Ballast Water Treatment System	USA	Filtration + Chlorine dioxide	Approved	Approved	Germany
Hyundai Heavy Industries Co., Ltd	HHI BWMS (EcoBallast)	Korea	Filtration + UV	Approved	Approved	Korea
Aquaworx ATC GmbH	AquaTriComb Ballast Water treatment system	Germany	Filtration + UV + Ultrasonic wave	Approved		
SIEMENS	SiCURE BWMS	Germany	Filtration+ Electrolysis	Approved	Approved	
SunRui Marine Environment Engineering Company	BalClor BWMS	China	Filtration+ Electrolysis	Approved	Approved	China

BWMS Manufacture	BWMS Name	Country	Process	Approval of Active Substances G9		Approval of BWMS G8
				Basic Approval	Final Approval	Country
DESMI Ocean Guard A/S	DESMI Ocean Guard BWMS	Denmark	Filtration + Ozone + Cavitation+UV	Approved	<u>Approved</u>	
21 st Century Shipbuilding Co., Ltd.	ARA Ballast	Korea	Filter + UV + Plasma	Approved	Approved	
Hyundai Heavy Industries Co., Ltd	HHI BWMS "HiBallast"	Korea	Filtration+Electrolysis	Approved	Approved	Korea
Kwang San Co., Ltd.	KS BWMS "En-Ballast"	Korea	Filtration+Electrolysis	Approved		
Qingdao Headway Technology Co., Ltd.	OceanGuard BWMS	China	Filter + Electro catalysis + Ultrasonic	Approved	Approved	China
China Ocean Shipping (Group) Company	Blue Ocean Shield	China	Filtration+UV	Approved	N.A.	China
Severn Trent DeNora	Severn Trent DeNora BalPure® BWMS	Germany	Filtration+Electrolysis	Approved	Approved	Germany
Hamann AG*	SEDNA system	Germany	Hydrocyclone + Filtration +Peraclean Ocean	Approved	Approved	Germany
Samsung Heavy Industries Co., Ltd	Purimar™ System	Korea	Filtration+Electrolysis	Approved	Approved	Korea
AQUA Eng. Co., Ltd.	AquaStar™ Ballast Water Management System	Korea	Filtration+Electrolysis	Approved	<u>Approved</u>	
Kuraray Co., Ltd	MICROFADE™ Ballast Water Management System	Japan	Filtration + Kuraray AS (calcium hypochlorite) + Kuraray NS (sodium sulfite (neutralizing agent))	Approved	<u>Approved</u>	
ERMA FIRST	ERMA FIRST Ballast Water Management System	Greece	Filtration + Hydrocyclone +Electrolysis	Approved	<u>Approved</u>	
Envirotech and Consultancy Pte. Ltd.	BlueSeas Ballast Water Management System	Singapore	Filtration+Electrolysis	Approved		
Katayama Chemical, Inc.	Ballast Water Management System with PERACLEAN® OCEAN (SKY-SYSTEM®)	Japan	Filtration+ acetic acid / hydrogen peroxide	Approved		
JFE Engineering Corporation	JFE Ballast Ace BallastWater Management System that makes use of NEO-CHLOP MARINE™	Japan	Filtration + Chemical Injection	Approved		
GEA Westfalia Separator Group GmbH	GEA Westfalia Separator BallastMaster Ballast Water Management System	Germany	Filtration+ sodium hypochlorite	Approved		

BWMS Manufacture	BWMS Name	Country	Process	Approval of Active Substances G9		Approval of BWMS G8
				Basic Approval	Final Approval	Country
Envirotech and Consultancy Pte. Ltd.	BlueWorld Ballast Water Management System	Singapore	Filtration + sodium hypochlorite	Approved		
Samsung Heavy Industries Co., Ltd.	Neo-Purimar™ Ballast Water Management System	Korea	Filtration + sodium hypochlorite	Approved	<u>Approved</u>	
Environment Engineering Institute of Dalian Maritime University	DMU .OH Ballast Water Management System	China	Filtration+ Sodium thiosulfate	<u>Approved</u>		
Hanla IMS Co., Ltd.	EcoGuardian™ Ballast Water Management System	Korea	Filtration + Electrolysis	<u>Approved</u>		
STX Metal Co., Ltd.	Smart Ballast Ballast Water Management System	Korea	Electrolysis	<u>Approved</u>		

(Underlined systems were approved or discussed at MEPC63)

* BWMS “Resource Ballast Water Technologies System” manufactured by Resource Ballast Technologies Pty and “SEDNA system” manufactured by Hamann AG have been withdrawn from the market and is no longer available.

(For reference)

BWMS that are not used active substances which have been type approved by Administrations in accordance with G8 guidelines

BWMS Manufacture	BWMS Name	Country	Process	Approval of Active Substances G9		Approval of BWMS G8
				Basic Approval	Final Approval	Country
OptiMarine AS	OptiMar Ballast Systems	Norway	Filtration + UV			Norway
NEI Treatment System	Venturi Oxygen Stripping	USA	Deoxygenation + Cavitation			Liberia
Hyde Marine Inc.	Hyde GURDIAN™	USA	Filtration + UV			UK
Wuxi Brightsky Electronic Co., Ltd.,	BSKY™ BWMS	China	Filtration + UV			China
MAHLE Industrial Filtration	Ocean Protection System	Germany	Filtration + UV			Germany