



**ANNEX 9**

**RESOLUTION MEPC.288(71)  
(adopted on 7 July 2017)**

**2017 GUIDELINES FOR BALLAST WATER EXCHANGE (G6)**

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 from ships,

RECALLING ALSO that the International Conference on Ballast Water Management for Ships held in February 2004 adopted the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (the Convention) together with four Conference resolutions,

NOTING that regulation A-2 of the Convention requires that discharge of ballast water shall only be conducted through ballast water management in accordance with the provisions of the Annex to the Convention,

NOTING ALSO that regulation B-4 of the Annex to the Convention addresses the conditions under which ballast water exchange should be conducted, taking into account Guidelines developed by the Organization,

NOTING FURTHER resolution MEPC.124(53) by which the Committee adopted the *Guidelines for ballast water exchange (G6)* and resolved to keep them under review,

HAVING AGREED, at its seventieth session, to revise the Guidelines (G6) to incorporate the ballast water reporting form set out in appendix 1 of the *Guidelines for the control and management of ships' ballast water to minimize the transfer of harmful aquatic organisms and pathogens* (resolution A.868(20)),

HAVING CONSIDERED, at its seventy-first session, draft revised *Guidelines for ballast water exchange (G6)*,

1 ADOPTS the *2017 Guidelines for ballast water exchange (G6)* (the 2017 Guidelines (G6)), as set out in the annex to this resolution;

2 INVITES Governments to apply the 2017 Guidelines (G6) as soon as possible, or when the Convention becomes applicable to them;

3 AGREES to keep the 2017 Guidelines (G6) under review in light of experience gained with their application;

4 REVOKES the Guidelines adopted by resolution MEPC.124(53).

## ANNEX

### 2017 GUIDELINES FOR BALLAST WATER EXCHANGE (G6)

#### 1 INTRODUCTION

1.1 The purpose of these Guidelines is to provide shipowners and operators with general guidance on the development of ship specific procedures for conducting ballast water exchange. Whenever possible shipowners and operators should enlist the assistance of classification societies or qualified marine surveyors in tailoring ballast exchange practices for various conditions of weather, cargo and stability. The application of processes and procedures concerning ballast water management are at the core of the solution to prevent, minimize and ultimately eliminate the introduction of harmful aquatic organisms and pathogens. Ballast water exchange offers a means, when used in conjunction with good ballast water management practices, to assist in achieving this solution.

1.2 Ballast water exchange introduces a number of safety issues, which affect both the ship and its crew. These Guidelines are intended to provide guidance on the safety and operational aspects of ballast water exchange at sea.

1.3 Given that there are different types of ships which may be required to undertake ballast water exchange at sea, it is impractical to provide specific guidelines for each ship type. Shipowners are cautioned that they should consider the many variables that apply to their ships. Some of these variables include type and size of ship, ballast tank configurations and associated pumping systems, trading routes and associated weather conditions, port State requirements and manning.

#### Application

1.4 The Guidelines apply to all those involved with ballast water exchange, including shipowners and operators, designers, classification societies and shipbuilders. Operational procedures and guidance reflecting the issues raised in these Guidelines should be reflected in the ship's ballast water management plan.

#### 2 DEFINITIONS

For the purposes of these Guidelines, the definitions in the International Convention for the Control and Management of Ships' Ballast Water and Sediments (the Convention) apply and "ballast water tank" means any tank, hold or space used for the carriage of ballast water.

#### 3 RESPONSIBILITIES

3.1 Shipowners and operators should ensure, prior to undertaking ballast water exchange, that all the safety aspects associated with the ballast water exchange method or methods used on board have been considered and that suitably trained personnel are on board. A review of the safety aspects, the suitability of the exchange methods being used and the aspects of crew training should be undertaken at regular intervals.

3.2 The ballast water management plan should include the duties of key shipboard control personnel undertaking ballast water exchange at sea. Such personnel should be fully conversant with the safety aspects of ballast water exchange and in particular the method of exchange used on board their ship and the particular safety aspects associated with the method used.

3.3 In accordance with regulation B-4.4 of the Convention, if the master reasonably decides that to perform ballast water exchange would threaten the safety or stability of the ship, its crew or its passengers, because of adverse weather, the ship's design, stress, equipment failure, or any other extraordinary condition, a ship shall not be required to comply with regulations B-4.1 and B-4.2.

- .1 When a ship does not undertake ballast water exchange for the reasons stated above, the reasons shall be entered in the ballast water record book.
- .2 The port or coastal State concerned may require that the discharge of ballast water must be in accordance with procedures determined by them, taking into account the *Guidelines for additional measures including emergency situations (G13)*.

3.4 Where a port State requires specific information regarding the management of ballast water on a ship bound for a port, offshore terminal or anchorage area in that port State, a completed ballast water reporting form as set out in the appendix may be submitted prior to entry into that port State in a timeframe required by that port State.

#### 4 BALLAST WATER EXCHANGE REQUIREMENTS

4.1 Exchange of ballast water in deep ocean areas or open seas offers a means of limiting the probability that harmful aquatic organisms and pathogens be transferred in ships' ballast water.

4.2 Regulation D-1 of the Convention requires that:

- .1 ships performing ballast water exchange in accordance with this regulation shall do so with an efficiency of at least 95% volumetric exchange of ballast water; and
- .2 for ships exchanging ballast water by the pumping-through method, pumping through three times the volume of each ballast water tank shall be considered to meet the standard described in paragraph 1. Pumping through less than three times the volume may be accepted provided the ship can demonstrate that at least 95% volumetric exchange is met.

4.3 There are three methods of ballast water exchange which have been evaluated and accepted by the Organization. The three methods are the sequential method, the flow-through method and the dilution method. The flow-through method and the dilution method are considered as "pump through" methods.

4.4 The three accepted methods can be described as follows:

- .1 **Sequential method** – a process by which a ballast tank intended for the carriage of ballast water is first emptied and then refilled with replacement ballast water to achieve at least a 95% volumetric exchange.
- .2 **Flow-through method** – a process by which replacement ballast water is pumped into a ballast tank intended for the carriage of ballast water, allowing water to flow through overflow or other arrangements.
- .3 **Dilution method** – a process by which replacement ballast water is filled through the top of the ballast tank intended for the carriage of ballast water

with simultaneous discharge from the bottom at the same flow rate and maintaining a constant level in the tank throughout the ballast exchange operation.

## **5 SAFETY PRECAUTIONS ASSOCIATED WITH BALLAST WATER EXCHANGE**

5.1 Three methods of carrying out ballast water exchange at sea have been identified as acceptable by the Organization. Each has particular safety aspects associated with it that should be considered when selecting the method(s) to be used on a particular ship.

5.2 When identifying the ballast water exchange method(s) for the first time for a particular ship, an evaluation should be made which should include:

- .1 the safety margins for stability and strength contained in allowable seagoing conditions, as specified in the approved trim and stability booklet and the loading manual relevant to individual types of ships. Account should also be taken of the loading conditions and the envisaged ballast water exchange method or methods to be used;
- .2 the ballast pumping and piping system taking account of the number of ballast pumps and their capacities, size and arrangements of ballast water tanks; and
- .3 the availability and capacity of tank vents and overflow arrangements, for the flow through method, the availability and capacity of tank overflow points, prevention of under and over pressurization of the ballast tanks.

5.3 Particular account should be taken of the following:

- .1 stability which is to be maintained at all times and not less than those values recommended by the Organization or required by the Administration;
- .2 longitudinal stress, and where applicable torsional stress values, not to exceed permitted values with regard to prevailing sea conditions;
- .3 exchange of ballast in tanks where significant structural loads may be generated by sloshing action in the partially filled tank to be carried out in favourable sea and swell conditions such that the risk of structural damage is minimized;
- .4 wave-induced hull vibrations when carrying out ballast water exchange;
- .5 limitations of the available methods of ballast water exchange in respect of sea and weather conditions;
- .6 forward and aft draughts and trim, with particular reference to bridge visibility, slamming, propeller immersion and minimum forward draft; and
- .7 additional workloads on the master and crew.

5.4 Having undertaken an evaluation for a particular ship and the exchange method or methods to be used, the ship should be provided with procedures, advice and information appropriate to the exchange method(s) identified and ship type in the ballast water management plan. The procedures, advice and information in the ballast water management plan may include but are not limited to the following:

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- .1 avoidance of over and under-pressurization of ballast tanks;
  - .2 free surface effects on stability and sloshing loads in tanks that may be slack at any one time;
  - .3 maintain adequate intact stability in accordance with an approved trim and stability booklet;
  - .4 permissible seagoing strength limits of shear forces and bending moments in accordance with an approved loading manual;
  - .5 torsional forces;
  - .6 forward and aft draughts and trim, with particular reference to bridge visibility, propeller immersion and minimum forward draft;
  - .7 wave-induced hull vibrations when performing ballast water exchange;
  - .8 watertight and weather-tight closures (e.g. manholes) which may have to be opened during ballast exchange must be re-secured;
  - .9 maximum pumping/flow rates – to ensure the tank is not subjected to a pressure greater than that for which it has been designed;
  - .10 internal transfers of ballast;
  - .11 admissible weather conditions;
  - .12 weather routeing in areas seasonably affected by cyclones, typhoons, hurricanes, or heavy icing conditions;
  - .13 documented records of ballasting and/or de-ballasting and/or internal transfers of ballast;
  - .14 contingency procedures for situations which may affect ballast water exchange at sea, including deteriorating weather conditions, pump failure and loss of power;
  - .15 time to complete the ballast water exchange for each tank or an appropriate sequence thereof;
  - .16 continual monitoring of the ballast water operation; monitoring should include pumps, levels in tanks, line and pump pressures, stability and stresses;
  - .17 a list of circumstances in which ballast water exchange should not be undertaken. These circumstances may result from critical situations of an exceptional nature or force majeure due to stress of weather, known equipment failures or defects, or any other circumstances in which human life or safety of the ship is threatened;
  - .18 ballast water exchange at sea should be avoided in freezing weather conditions. However, when it is deemed absolutely necessary, particular attention should be paid to the hazards associated with the freezing of overboard discharge arrangements, air pipes, ballast system valves together with their means of control, and the build-up of ice on deck; and

- .19 personnel safety, including precautions which may be required when personnel are required to work on deck at night, in heavy weather, when ballast water overflows the deck, and in freezing conditions. These concerns may be related to the risks to the personnel of falling and injury, due to the slippery wet surface of the deck plate, when water is overflowing on deck, and to the direct contact with the ballast water, in terms of occupational health and safety.

5.5 During ballast water exchange sequences there may be times when, for a transitory period, one or more of the following criteria cannot be fully met or are found to be difficult to maintain:

- .1 bridge visibility standards (SOLAS regulation V/22);
- .2 propeller immersion; and
- .3 minimum draft forward.

5.6 As the choice of acceptable ballast water exchange sequences is limited for most ships, it is not always practicable to dismiss from consideration those sequences where transitory non-compliance may occur. The practical alternative would be to accept such sequences provided an appropriate note is placed in the ballast water management plan to alert the ship's master. The note would advise the master of the nature of the transitory non-compliance, that additional planning may be required and that adequate precautions need to be taken when using such sequences.

5.7 In planning a ballast water exchange operation that includes sequences which involve periods when the criteria for propeller immersion, minimum draft and/or trim and bridge visibility cannot be met, the master should assess:

- .1 the duration(s) and time(s) during the operation that any of the criteria will not be met;
- .2 the effect(s) on the navigational and manoeuvring capabilities of the ship; and
- .3 the time to complete the operation.

5.8 A decision to proceed with the operation should only be taken when it is anticipated that:

- .1 the ship will be in open water;
- .2 the traffic density will be low;
- .3 an enhanced navigational watch will be maintained including if necessary an additional look out forward with adequate communications with the navigation bridge;
- .4 the manoeuvrability of the vessel will not be unduly impaired by the draft and trim and or propeller immersion during the transitory period; and
- .5 the general weather and sea-state conditions will be suitable and unlikely to deteriorate.

5.9 On oil tankers, segregated ballast and clean ballast may be discharged below the water line at sea by pumps if the ballast water exchange is performed under the provisions of regulation D-1.1 of the Convention, provided that the surface of the ballast water has been examined either visually or by other means immediately before the discharge to ensure that no contamination with oil has taken place.

## **6 CREW TRAINING AND FAMILIARIZATION**

6.1 Appropriate training for ships' masters and crews should include instructions on the safety issues associated with ballast water exchange based upon the information contained in these Guidelines. Instruction should be provided on the ships' ballast water management plan including the completion of required records.

6.2 Ships' officers and crew engaged in ballast water exchange at sea should be trained in and be familiar with the following as appropriate:

- .1 the ship's ballast pumping and piping arrangements, positions of associated air and sounding pipes, positions of all compartment and tank suction and pipelines connecting them to ship's ballast pumps and, in the case of use of the flow through method of ballast water exchange, the openings used for release of water from the top of the tank together with overboard discharge arrangements;
- .2 the method of ensuring that sounding pipes are clear, and that air pipes and their non-return devices are in good order;
- .3 the different times required to undertake the various ballast water exchange operations including the time to complete individual tanks;
- .4 the method(s) in use for ballast water exchange at sea if applicable with particular reference to required safety precautions; and
- .5 the need to continually monitor ballast water exchange operations.

## **7 FUTURE CONSIDERATIONS IN RELATION TO BALLAST WATER EXCHANGE**

These Guidelines may be revised and updated in the light of possible technical evolutions with the ballast water exchange methods and of new ballast water management options.



APPENDIX

**EXAMPLE BALLAST WATER REPORTING FORM**

Date of Submission (DD/MM/YYYY): \_\_\_\_\_ Time of Submission (24:00 GST): \_\_\_\_\_

**AMENDED FORM: Yes  No**

1. SHIP INFORMATION	2. VOYAGE INFORMATION	3. BALLAST WATER USAGE AND CAPACITY		
Ship Name:	Arrival Port:			
IMO Number:	Arrival Date (DD/MM/YYYY):	Total Ballast Water on Board:		
Owner:	Agent:	Volume	Units	No. of Tanks and Holds in Ballast
Type:	Last Port: Country:		m <sup>3</sup>	
GT:	Next Port: Country:	Total Ballast Water Capacity:		
Date of Construction (DD/MM/YYYY):	Next Port (2): Country:	Volume	Units	Total No. of Ballast Tanks and Holds on Ship
Flag:	Next Port (3): Country:		m <sup>3</sup>	

**4. BALLAST WATER MANAGEMENT**

Total No. Ballast Water Tanks to be discharged:

Of tanks to be discharged, how many:  underwent exchange:  were treated using a Ballast Water Management System:

Please specify Ballast Water Management System used, if any (Manufacturer, Model): \_\_\_\_\_

If no Ballast Water Management conducted, state reason why not: \_\_\_\_\_

Approved Ballast Water Management plan on board? YES  NO

Management plan implemented? YES  NO

Ballast water record book on board? YES  NO

Does ship carry an International Ballast Water Management Certificate: YES  NO

Date of issue (DD/MM/YYYY): \_\_\_\_\_ Expiry Date (DD/MM/YYYY): \_\_\_\_\_

Authority that issued Certificate: \_\_\_\_\_ Place of issue: \_\_\_\_\_

Date Required to Meet Regulation D-2 (DD/MM/YYYY): \_\_\_\_\_

5. **BALLAST WATER HISTORY: RECORD ALL TANKS/ HOLDS** containing water taken on board to control trim, list, draught, stability or stresses of the ship, regardless of ballast water discharge intentions, on page 2. Note: BW Sources are the last BW uptakes prior to any Ballast Water Management practices.

6. **RESPONSIBLE OFFICER'S NAME AND TITLE:**

Ship Name \_\_\_\_\_ IMO Number \_\_\_\_\_ Arrival Date: \_\_\_\_\_

Tanks/Holds <small>List multiple sources/ tanks separately</small>	TANK CAPACITY	BW SOURCES		CURRENT VOLUME (m <sup>3</sup> )	BW MANAGEMENT PRACTICES							PROPOSED BW DISCHARGE					
		DATE DD/MM/YYYY	PORT or LAT. LONG.		DATE DD/MM/Y YYY	Start Point* Lat. & Long.	End Point* Lat. & Long.	VOLUME Used* (m <sup>3</sup> )	% Exch*	METHOD (DM/SM/ FM, T)	SALINITY (PSU)	DATE DD/MM/YYYY	PORT or LAT. LONG.	VOLUME (m <sup>3</sup> )	SALINITY (PSU)		

Ballast Water Tank Codes: Forepeak = FP, Aftpeak = AP, Double Bottom = DB, Wing = WT, Topside = TS, Cargo Hold = CH, Other = O.  
 Methods: DM= Dilution, SM=Sequential, FM= Flow Through , T=Treatment.  
 Complete columns with (\*) only if exchange was conducted.

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