

RESOLUTION MEPC.150(55)  
Adopted on 13 October 2006  
GUIDELINES ON DESIGN AND CONSTRUCTION TO FACILITATE  
SEDIMENT CONTROL ON SHIPS (G12)

**ANNEX 2**

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**GUIDELINES ON DESIGN AND CONSTRUCTION TO FACILITATE  
SEDIMENT CONTROL ON SHIPS (G12)**

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 the international conventions for the prevention and control of marine pollution,

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 Ballast Water Management Convention) together with four Conference resolutions,

NOTING that Regulation A-2 of the Ballast Water Management 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 FURTHER that Regulation B-5.2 of the Ballast Water Management Convention provides that, ships constructed in or after 2009 should, without compromising safety or operational efficiency, be designed and constructed with a view to minimize the uptake and undesirable entrapment of sediments, facilitate removal of sediments, and provide safe access to allow for sediment removal and sampling taking into account Guidelines developed by the Organization,

NOTING ALSO that resolution 1 adopted by the International Conference on Ballast Water Management for Ships invited the Organization to develop these Guidelines as a matter of urgency,

HAVING CONSIDERED, at its fifty-fifth session, the draft Guidelines on design and construction to facilitate sediment control on ships developed by the Ballast Water Working Group, and the recommendation made by the Sub-Committee on Bulk Liquids and Gases at its tenth session,

1. ADOPTS the Guidelines on design and construction to facilitate sediment control on ships as set out in the Annex to this resolution;
2. INVITES Governments to apply the Guidelines as soon as possible, or when the Convention becomes applicable to them; and
3. AGREES to keep the Guidelines under review.

## ANNEX

### **GUIDELINES ON DESIGN AND CONSTRUCTION TO FACILITATE SEDIMENT CONTROL ON SHIPS (G12)**

#### **1 PURPOSE**

1.1 Regulation B-5.2 of the Convention requires that ships described in Regulations B-3.3 to B-3.5 should, without compromising safety or operational efficiency, be designed and constructed with a view to minimize the uptake and undesirable entrapment of sediments, facilitate removal of sediments and provide safe access to allow for sediment removal and sampling, taking into account these Guidelines. Ships described in Regulation B-3.1 of the Convention should, to the extent practicable, also comply with Regulation B-5.2 taking into account these Guidelines.

1.2 The purpose of these Guidelines is to provide guidance to ship designers, ship builders, owners and operators in the development of ship structures and equipment to achieve the objectives of paragraph 1.1 and thereby, reduce the possibility of introducing harmful aquatic organisms and pathogens.

1.3 There may be a conflict between preventing accumulation of sediments and preventing the discharge of harmful aquatic organisms and pathogens.

#### **2 INTRODUCTION**

2.1 Water taken up as ships' ballast can contain solid alluvial matter that, once the water is becalmed in a ship's ballast tank, will settle out onto the bottom of the tank and other internal structures.

2.2 Aquatic organisms can also settle out of the ballast water and can continue to exist within the sediment. These organisms can survive for long periods after the water they were originally in has been discharged. They may thereby be transported from their natural habitat and discharged in another port or area where they may cause injury or damage to the environment, human health, property and resources.

2.3 Regulation B-5.1 of the Convention requires that all ships remove and dispose of sediments from spaces designated to carry ballast water in accordance with the Ballast Water Management Plans. These Guidelines are to assist ship designers, ship builders, owners and operators to design ships to minimise the retention of sediment. Guidance on the management of sediment is contained in the Guidelines for Ballast Water Management and the Development of Ballast Water Management Plans (G4).

#### **3 DEFINITIONS**

3.1 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.

3.2 Ballast Water Tank – for the purposes of these Guidelines a ballast water tank is any tank, hold or space used for the carriage of ballast water as defined in Article 1 of the Convention.

#### **4 DESIGN FOR REDUCING ACCUMULATION OF SEDIMENT**

4.1 Ballast water tanks and their internal structure should be designed to avoid the accumulation of sediment in a ballast tank. The following should, as far as is practicable, be taken into account when designing ballast tanks:

- .1 horizontal surfaces to be avoided wherever possible;
- .2 where longitudinals are fitted with face bar stiffeners, consideration should be given to fit the face bar stiffeners below the horizontal surfaces to aid drain off from the stiffeners;
- .3 arrange for induced flows of water, either by pump forces or gravitational forces, to wash along horizontal or near horizontal surfaces so that it re-suspends already settled sediment;
- .4 where horizontal stringers or webs are required, drainage holes to be as large as possible, especially if edge toe-stops are fitted where horizontal stringers are used as walkways, to encourage rapid flow of water off them as the water level in the tank falls;
- .5 internal girders, longitudinals, stiffeners, intercostals and floors, where fitted should incorporate extra drain holes which allow water to flow with minimal restriction during discharge and stripping operations;
- .6 where inner members butt against bulkheads, their installation should be such as to prevent the formation of stagnant pools or sediment traps;
- .7 scallops should be located at the joints of the inner bottom (tank top) longitudinals or intercostals and floors to allow for good airflow, and thus drying out of an empty tank. This will also allow air to escape to the air pipe during filling so that minimum air is trapped within the tank;
- .8 pipeline systems should be designed such that, when deballasting, disturbance of the water in the tank is as powerful as possible, so that the turbulence re-suspends sediment; and
- .9 flow patterns in ballast water tanks should be studied (for example by the use of Computational Fluid Dynamics (CFD)) and considered, so that internal structure can be designed to provide effective flushing. The amount of internal structure in double bottom tanks will reduce the scope for improving flow patterns. The hydrodynamic performance of the ballast tank is crucial to ensure sediment scouring.

4.2 Any designs depending upon water flow to re-suspend sediment should, as far as possible be independent of human intervention, in order that the work load of ships' crews is minimal when operating the system.

4.3 The benefits of design concepts for reducing sediment accumulation are that there is likely to be good sediment removal while deballasting, with minimum retention of sediment in the tanks, and therefore a reduction or no need for removal by other means.

4.4 The design of all ships should provide safe access to allow for sediment removal and sampling.

4.5 The design of ballast water tanks should facilitate installation of high sea suction points on each side of the tank.

4.6 When practical, equipment to remove suspended matter at the point of uptake should be installed.

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