RULES FOR
CLASSIFICATION OF

SHIPS

NEWBUILDINGS

SPECIAL EQUIPMENT AND SYSTEMS
ADDITIONAL CLASS

PART 6 CHAPTER 18

BALLAST WATER MANAGEMENT

JULY 2005
This booklet includes the relevant amendments and corrections shown in the July 2009 version of Pt.0 Ch.1 Sec.3.

CONTENTS PAGE

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CHANGES IN THE RULES

General

The Board approved this new chapter in June 2005.

The rules come into force on 1 July 2005.

This chapter is valid until superseded by a revised chapter. Supplements will not be issued except for an updated list of corrections presented in Pt.0 Ch.1 Sec.3. Pt.0 Ch.1 is normally revised in January and July each year.

Revised chapters will be forwarded to all subscribers to the rules. Buyers of reprints are advised to check the updated list of rule chapters printed in Pt.0 Ch.1 Sec.1 to ensure that the chapter is current.

Introduction

The International Convention for the Control and Management of Ship's Ballast Water and Sediments, (known as the "Convention") provides regulations for Ballast Water Management, and was adopted by IMO on the 13 February 2004.

The Convention will apply to ships registered in countries which have ratified the Convention, and to foreign flag ships when trading in waters coming under the jurisdiction of the countries that are party to the Convention.

It is expected that DNV will be requested to act on behalf of several flag states with respect to the Convention, and will thus prepare the rules and the supporting tools (i.e. certificates, Instructions to Surveyors and check lists) to be available as a part of a DNV service.

It should be noted that if the Convention enters into force after 1 January 2009, the Convention will have retroactive effect with respect to ballast water treatment.

Even though the Convention has not been ratified by a sufficient number of flag states and has not yet entered into force, there is already an increasing demand for demonstrating compliance with the Convention, since many states and ports request evidence that the ballast water has been exchanged.

Through the product introduced with this proposal; i.e. a set of class notations covering the Convention, it is believed that the customer's expectations can be met.

Additional class notations related to the Convention

There follows a brief description of the relevant additional class notations, as related to the convention.

Vessels complying with the requirements in the Convention may be given one of the following additional class notations:

BWM-E ( ) Ballast water exchange, where a predefined letter in the bracket denotes the method for exchange that has been applied.

BWM-T Ballast water treatment. Applicable to vessels complying with the Convention by means of system(s) for treatment of ballast water complying with the Guidelines for Approval of Ballast Water Management Systems.

BWM-TP Ballast water treatment (prototype). Applicable to vessels complying with the Convention by means of system(s) for treatment of ballast water complying with the Guidelines for Approval of Prototype Ballast Water Treatment Technologies.

More detailed information is contained within the rule booklet.

Comments to the rules may be sent by e-mail to *rules@dnv.com*
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Comprehensive information about DNV and the Society's services is found at the Web site http://www.dnv.com

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SECTION 1
GENERAL REQUIREMENTS

A. Classification

A 100 Application

101 The rules in this chapter state requirements for vessels complying with the International Convention for the Control and Management of Ship's Ballast Water and Sediments (hereafter called the Convention) as adopted by IMO 13 February 2004. The requirements shall be regarded as supplementary to those given for the assignment of main class.

102 Where "Guidelines" are referred to in this text, these are the Guidelines referred to in the Convention.

A 200 Class notations

201 Vessels complying with the requirements in this chapter may be given one or combinations of the additional class notations:

BWM-E ( )	Ballast water exchange, where the letter(s) in the bracket denote the method for exchange that has been applied, see 202.
BWM-EP ( )	Ballast water enhanced exchange-performance, where the letter(s) in the bracket denote the method for exchange that has been applied, see 202 and Sec.3 E.
BWM-T	Ballast water treatment.
BWM-TP	Ballast water treatment (prototype).

202 The class notations **BWM-E ( )** and **BWM-EP ( )** are applicable to vessels complying with the Convention by means of ballast water exchange. The exchange of the ballast water could take place either by the sequential method, dilution method or by the flow through method. The applied method is indicated by the letters in the bracket:

d	for dilution method
s	for sequential method
f	for flow-through method (see Sec.3 E103).

203 The class notation **BWM-T** is applicable to vessels complying with the Convention by means of system(s) for treatment of ballast water complying with the Guidelines for Approval of Ballast Water Management Systems.

204 The class notation **BWM-TP** is applicable to vessels complying with the Convention by means of system(s) for treatment of ballast water complying with the Guidelines for Approval of Prototype Ballast Water Treatment Technologies.

B. Definitions

B 100 General

101 The following definitions apply:

Sequential method: a process by which a ballast tank or hold intended for the carriage of water ballast is first emptied of at least 95% or more of its volume and then refilled with replacement ballast water.

Flow through method: a process by which replacement ballast water is pumped into a ballast tank or hold intended for the carriage of water ballast allowing water to flow through overflow or other arrangements. At least three times the tank or hold volume shall be pumped through the tank or hold.

Dilution method: a process by which replacement ballast water is filled through the top of the ballast tank or hold intended for the carriage of water ballast with simultaneous discharge from the bottom at the same flow rate and maintaining a constant level in the tank or hold. At least 3 times the tank or hold volume shall be pumped through the tank or hold.

Ballast water: water with its suspended matter taken on board a ship to control trim, list, draught, stability or stresses of the vessel.

Administration: the government of the state under whose authority the ship is operating. With respect to a ship entitled to fly a flag of any state, the Administration is the government of that state.

Ballast Water management System: any system which processes ballast water such that it meets or exceeds the Ballast Water Performance Standard in Regulation D-2 in the Convention. The BMWS includes ballast water treatment equipment, all associated control equipment, monitoring equipment and sampling facilities.

Ballast Water treatment Equipment: a mechanical, physical, chemical, or biological process, either singularly or in combination, that removes, renders harmless, or avoids the uptake or discharge of harmful aquatic organisms and pathogens within ballast water and sediments. Ballast water treatment equipment may operate at the uptake or discharge of ballast water, during the voyage, or at a combination of these events.

C. Documentation

C 100 General

101 Details related to additional classes regarding design, arrangement and strength are in general to be included in the plans specified for the main class.

102 The following documentation shall be submitted for approval:

— ballast water management plan
— drawing showing ballast water and tank sediment sampling points.

Guidance note:

For details on how to prepare a Ballast Water Management Plan reference is made to DNV Model Plan

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Guidance note:

For details on sampling points refer to the Guideline for ballast water sampling.

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103 Documentation to be kept and used onboard, but not subject to approval:

— Ballast water record book.

104 For vessels with the notation **BWM-EP ( )** the following additional documentation shall be submitted:

For approval:

— Arrangement of Ballast Water overflow system, if applicable.

105 For vessels with the notation **BWM-T** the following documentation shall be submitted:

For approval:

— Drawings showing hook-up and connections of piping- / electrical- /control systems to existing ship systems.

For verification:

— Copy of Type Approval Certificate for the Ballast Water Management System issued by the Administration.

Guidance note:

A Certificate of type Approval should be in the format shown in the Guidelines for Approval of Ballast Water Management Systems.

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106 For vessels with the notation **BWM-TP** the following documentation shall be submitted:

For approval:

— Drawings showing hook-up and connections of piping- / electrical- /control systems to existing ship systems

For verification:

— Copy of Statement of Compliance issued by Administration confirming that the vessel has a Prototype Ballast Water Treatment Technologies Programme in accordance with the Guidelines for Approval and Oversight of Prototype Ballast Water Treatment Technology Programmes.

SECTION 2
GENERAL REQUIREMENTS

A. Requirements applicable to all ships

A 100 Strength requirements

101 All strength requirements applicable to the ship shall be met during the ballast water management operation. Special consideration shall be given to the following parameters, as relevant depending on the method:

— hull girder strength (bending, shear and torsion)
— sloshing in tanks
— bottom slamming
— over pressure in tanks.

A 200 Stability

201 All stability requirements applicable to the ship shall be met during the ballast water management operation.

202 Free surfaces of ballast tanks that may become slack during the ballast water management operation process shall be accounted for.

Guidance note:

It is recommended to account for the maximum free surface effect of a tank even when the tank is nearly empty or nearly full.

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A 300 Visibility, propeller immersion and forward draught

301 The visibility requirements as set forth by SOLAS Ch.V, Reg.22 shall in general be complied with during the ballast water management operation. The same applies for propeller immersion and minimum draught or trim limits.

Guidance note:

In case any of the above limits are exceeded, the guidelines included in IMO MSC/Circ. 1145 “Precautionary advice to masters when undertaking ballast water exchange operations” should be followed.

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SECTION 3
CLASS NOTATION BWM-E ( ) AND BWM-EP ( )

A. Introduction

A 100 General

101 Ballast water exchange will be phased out as an acceptable method for complying with the Convention, depending on ballast water capacity and date of delivery of the vessel. Thereafter, ballast water treatment will be the only remaining option for complying with the Convention.

Guidance note:

The class notations **BWM-E ( )** and **BWM-EP ( )** will be withdrawn when the ballast water exchange has been phased out.

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B. Requirements

B 100 General requirements

101 The requirements given in this section shall be applied to vessels where ballast water exchange at sea is accepted as a process in lieu of treatment of ballast water.

102 Where the sequential method is adopted the sequences for both normal ballast and heavy ballast shall be included in the ballast water management plan, if applicable. The sequences shall be such that:

i) Ballast water exchange can be performed at all filling levels of bunker tanks.

ii) In one sequence each tank shall be emptied and refilled only once.

Guidance note:

For ships in operation the requirement in ii) may be especially considered.

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B 200 Valve arrangement

201 Every ballast tank and hold intended for the carriage of water ballast shall be provided with isolating valves for filling and/or emptying purposes.

202 To ensure that the movement of ballast water only takes place as required, the isolating valves for a ballast tank or hold intended for the carriage of water ballast shall be arranged so that they remain closed at all times except when ballasting, deballasting or ballast exchange operations are being carried out.

B 300 Sea chests and shipside openings intended for ballast water exchange

301 The relative positions of ballast water intake and discharge openings shall be such as to preclude as far as practicable the possibility of contamination of replacement ballast water by water which is being pumped out.

B 400 System arrangement

401 The design of ballast water systems shall allow for ballast water exchange operations with the minimum number of operational procedures.

402 The internal arrangements of ballast tanks as well as ballast water piping inlet and outlet arrangements shall allow for required ballast water exchange and the clearing of sediments.

B 500 Control features

501 *Remote control* - ballast pumps, and all valves to be operated during ballast water exchange shall be provided with a means of remote control from a central ballast control station. Pump start/stop shall be included. Flow/speed control shall also be included, if part of the control system.

502 *Local control* - a means of local control shall be provided at each ballast pump operated during ballast water exchange.

503 *Secondary means of control* - a manually operated independent means of control of all valves required for ballast water exchange shall also be provided for operation in the event of main control system failure.

504 The central ballast control station shall include the following:

— valve position indicating system
— tank level indicating system
— tank level alarm (not applicable for tanks using flow through)
— draught indicating system
— means of communication between the central ballast control station and those spaces containing the means of local control for the ballast pumps and the manually operated independent means of control for the valves.

Guidance note:

Wireless communication such as UHF portable handset is acceptable.

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B 600 Tanks

601 The design of ballast tanks shall recognise the need for ready sampling of ballast water and sediments. The area immediately below any tank opening shall be kept free of obstructions that could impede the use of sampling equipment or free access.

Guidance note:

Providing safe access to the tanks by the fitting of tank hatches as an alternative to manholes is recommended.

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C. Requirements applicable to ships using flow-through method, class notation BWM-E (f)

C 100 Piping and systems

101 The capability of the ballast water system to provide ballast water exchange by the flow-through method without the risk of the tank being subject to a pressure greater than that for which it has been designed shall be demonstrated by water flow calculations or by testing on board. See Pt.4 Ch.6 Sec.4 K201.

102 The flow-through method with water flowing over the deck is not permitted for ships with class notations referred to in Pt.5 Ch.1 Sec.3 to Sec.6 and Ch.1 Sec.5.

Guidance note:

The use of collecting pipes, internal overflow pipes or interconnecting pipe/trunk arrangements between tanks may be used to avoid water flowing over the deck.

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D. Requirements applicable to ships using dilution method, class notation BWM-E (d)

D 100 Piping and systems

101 Level monitoring system shall be provided where maintaining a constant level in a tank is essential to the safety of the ship during ballast water exchange.

E. Additional requirements for Class Notation BWM-EP ( )

E 100 General

101 On ships classed for navigation in ice according to Pt.5 Ch.1 Sec.3 and Sec.6, ship side ballast discharge valves placed above the assigned lightest load line shall be arranged with adequate heating arrangements

102 For class notation **BWM-EP (s)** for sequential method, the capacity of each ballast pump is, in general, to be capable of providing ballast water exchange of the largest dedicated ballast water tank or group of tanks that are undergoing simultaneous exchange (whichever is the greater volume), as per the approved BWM plan, within three hours.

Guidance note:

In special cases with large ballast water tanks/spaces the duration may be considered from case to case taking into account the duration of the ballast water exchange process, provided the whole ballast water exchange process is shorter than 24 hours.

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For cargo holds used for the carriage of water ballast will require an extended period of time and is normally to be completed within twenty four hours by one pump.

103 The flow-through method with water flowing over the deck is not permitted for ships with class notation **BWM-EP (f)**

Guidance note:

The use of collecting pipes, internal overflow pipes or interconnecting pipe/trunk arrangements between tanks may be used to avoid water flowing over the deck.

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104 For class notation **BWM-EP (d)** for dilution method, arrangements shall be made to automatically maintaining the ballast water level in the tanks at a constant level. These arrangements shall include the provision of a manual emergency stop for any operating ballast pump, in case of valve malfunction or incorrect control actions.

SECTION 4
CLASS NOTATION BWM-T

A. Introduction

A 100 General

101 Ballast Water Management System shall comply with the performance standard as set forth by the Regulation D-2 of the Convention.

B. Requirements

B 100 General requirements

101 The Ballast Water Management System installed onboard shall be approved in accordance with Guidelines for Approval of Ballast Water Management Systems (BWMS).

102 The design of ballast water system shall recognise the need for ready sampling of ballast water and sediments. The area immediately below any tank opening shall be kept free of obstructions that could impede the use of sampling equipment or free access.

Guidance note:
Providing safe access to the tanks by the fitting of tank hatches as an alternative to manholes is recommended.

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103 The BWMS shall be provided with sampling facilities so arranged in order to collect representative samples of the ship's ballast water. Sampling facilities shall in any case be located on the BWMS intake, before the discharging points, and any other points necessary for sampling to ascertain the proper functioning of the equipment.

Guidance note:
Refer to the Guidelines for the approval of Ballast Water Management Systems.

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B 200 Testing and verification onboard

201 Installation testing and verification of the BWMS shall be carried out in accordance with the Guidelines for approval of BWMS.

SECTION 5
CLASS NOTATION BWM-TP

A. Introduction

A 100 General

101 The Convention allows for ships participating in a programme approved by the Administration to test and evaluate promising ballast water technologies to be given temporary dispensation before having to comply with the ballast water performance standard.

B. Requirements

B 100 General requirements

101 The Prototype Ballast Water Treatment Technology used onboard shall have an approved programme in accordance with the Guidelines for Approval of Prototype Ballast Water Treatment Technologies.

102 The design of ballast tanks shall recognise the need for ready sampling of ballast water and sediments. The area immediately below any tank opening shall be kept free of obstructions that could impede the use of sampling equipment or free access.

Guidance note:

Providing safe access to the tanks by the fitting of tank hatches as an alternative to manholes is recommended.

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103 The BWMS shall be provided with sampling facilities so arranged in order to collect representative samples of the ship's ballast water. Sampling facilities shall in any case be located on the BWMS intake, before the discharging points, and any other points necessary for sampling to ascertain the proper functioning of the equipment.

B 200 Testing and verification onboard

201 Installation testing and verification of the Ballast Water Management System shall be carried out in accordance with the Guidelines for Approval of Prototype Ballast Water Treatment Technologies.