Ballast Water Management

TRANSPORTSTYRELSEN

Sjöfartsseminarium 2017

Göteborg 8-9 Mars

Klassen - Hur arbetar vi med implementeringen av barlastvattenkonventionen

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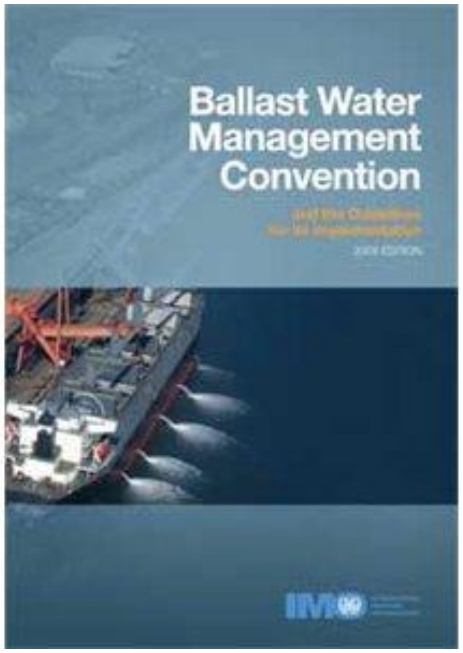
DNV GL

Høvik, Norge

Ballast Water Management Convention

- Ballast Water Management Plan (approved)
- Ballast Water Record Book
- Ballast water exchange (standard D-1)
  - Sequential exchange method (s)
  - Flow-through exchange method (f)
  - Dilution exchange method (d)
  - 95% (3 times)
- Ballast water treatment (standard D-2)
  - 10 viable organisms / m3 (> 50 micrometres)
  - 10 viable organisms / ml (10-50 micrometres)
  - Indicator microbes (toxic Vibrio cholerae, Escherichia, Intestinal Enterococci)
- Sediment management
- Surveys (initial, annual, intermediate, renewal)
- International Ballast Water Management Certificate



The Class Role for BWM Convention

Statutory requirements (flag State)

- Approved BWM plan
- Ballast water record book
- Type approved BWTS
- Sampling ports
- Installation survey
- Annual survey
- International BWM Certificate

IMO/Flag defines the acceptance criteria

Class requirements

- Safe installation
- Interference with other equipment
- None-essential equipment

- DNVGL/IACS defines the acceptance criteria

DNV GL – involvement in the BWM Convention

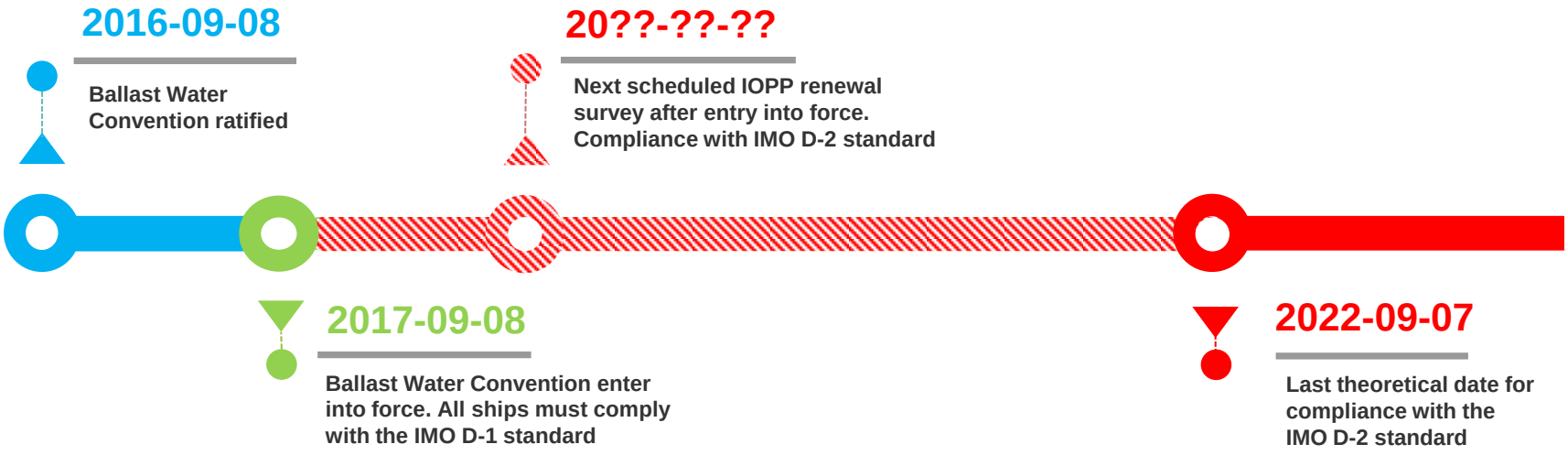
- Installation of BWTS in NB and retrofits
  - Voluntary class notation CLEAN DESIGN already require BWTS in newbuildings
  - Voluntary class notation BWM-E, BWM-T and Statement of Compliance BWM (E/T)
  - About 800 vessels classed by DNV GL have BWTS (out of 12000 vessels) – less than 10%

- Delegated by Flag State as RO (recognised organisation)
  - Approve BWM Plans
  - Perform initial survey and periodical surveys (annual, intermediate, renewal)
  - Issue International BWM Certificate

- Type Approval BWTS
  - Since 2008 – done the type approval process and issued TA (IMO/Norway/xx) for 13 BWTS
  - Delegated Independent Lab by USCG in June 2013
  - Involved in about 20 BWTS for USCG type approval in various stages (large interest)

BWM Convention Implementation Timeline

- Vessels for which the convention applies shall by 8 September 2017:
  - have procedures in place for BW exchange (D-1 standard)
  - carry on board an International BWM Certificate
- Vessels shall comply with the D-2 standard (BW treatment), by the latest at the next IOPP renewal survey after 8 September 2017, thus a BW treatment system (BWTS) is to be installed.



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DNV GL expected scope of work

- Assume DNV GL is delegated as RO (recognised organisation) by most flags.
- We estimate **8,700 vessels** (DNV GL) shall be issued **International BWM Certificate** by 8 September 2017 (175 cert per week in 50 weeks).
- Before IBWMC – **approved BWM Plan** (exchange method(s)) – we estimate **5000 plans** shall be approved by DNV GL in the next 12 months. Approval in Oslo, Hamburg, Piraeus, Gdansk, Pusan and Shanghai.
- Before IBWMC – **completed BWM initial survey** (BWM Plan, BWM record book, procedures/awareness). Most of these **surveys** will be done in relation to other periodical surveys.
- **Installation of BWTS** will come in the next 6 years. DNV GL expect **about 450 retrofit projects per year** (this include sister vessels). Assume 10 man-days approval work per project. We have had focused training of our approval engineers in Oslo, Hamburg, Piraeus, Gdansk, Pusan and Shanghai.

Shipowner – scope of work

- Identify vessels subject to the BWM Convention
- Investigate if an APPROVED Ballast Water Management Plan exist on board
- If not – make such and get it approved as soon as possible
- Arrange for a BWM initial survey by class (can be combined with periodical survey)
- DNV GL can issue International BWM Certificate already now if we are delegated (will formally not be valid until 8 September 2017)
  - Approved BWM plan
  - Initial survey
- **All applicable vessel shall have the International BWM Certificate by 8 September 2017**

- Start planning for the installation of BWTS – check renewal date for each vessel, involve class early for plan approval.

RRs issued to create awareness - NPS vessel info / status

The following RRs depending on the 'BWM status' of the ship and if >400GT or < 400GT have been issued (due date 08.09.2017 for 1-3):

Phase	BWM Status / Issue	No. of RR	Applicable
1a	BWM plan approval is missing	RR1034a	All ships
1b	BWM plan is stamped 'examined' (only 1A1)	RR1034b	All ships
2	Initial BWM survey is missing	RR1034c	>400GT
3	BWM certificate (SoC/CoC/IBWMC) is missing	RR1034d	>400GT
4	Int. BWM certificate to be issued when Flag has ratified BWMC.	RR1034e	>400GT
5	D-2 standard must be met, incl. approved BWM plan for D-2.	RR1034f	All ships
6	Initial BWM survey and certificate for D-2 standard is missing.	RR1034g	>400GT

RRs issued in NPS vessel info / example Ref 1034c

RR 1034c (Due date 08.09.2017), BWM survey must be carried out, ships ≥ 400GT,

Ballast Water management – exchange and treatment:

If the Ballast Water Management (BWM) Convention applies to this vessel (refer to Article 3 of the BWM Convention), the ship must be initially surveyed according to Reg. E-1 before the due date.

Precondition is having an approved BWM plan on board, before the initial BWM survey can be ordered accordingly.

A full term certificate (IBWMC or CoC) or statement (SoC) will be issued depending on the ratification status and on the authorization of DNV GL by the flag after sufficient survey by the surveyor on board or by Head Office or by the flag administration.

At least the surveyor should issue a short term IBWMC, CoC or SoC after sufficient survey.

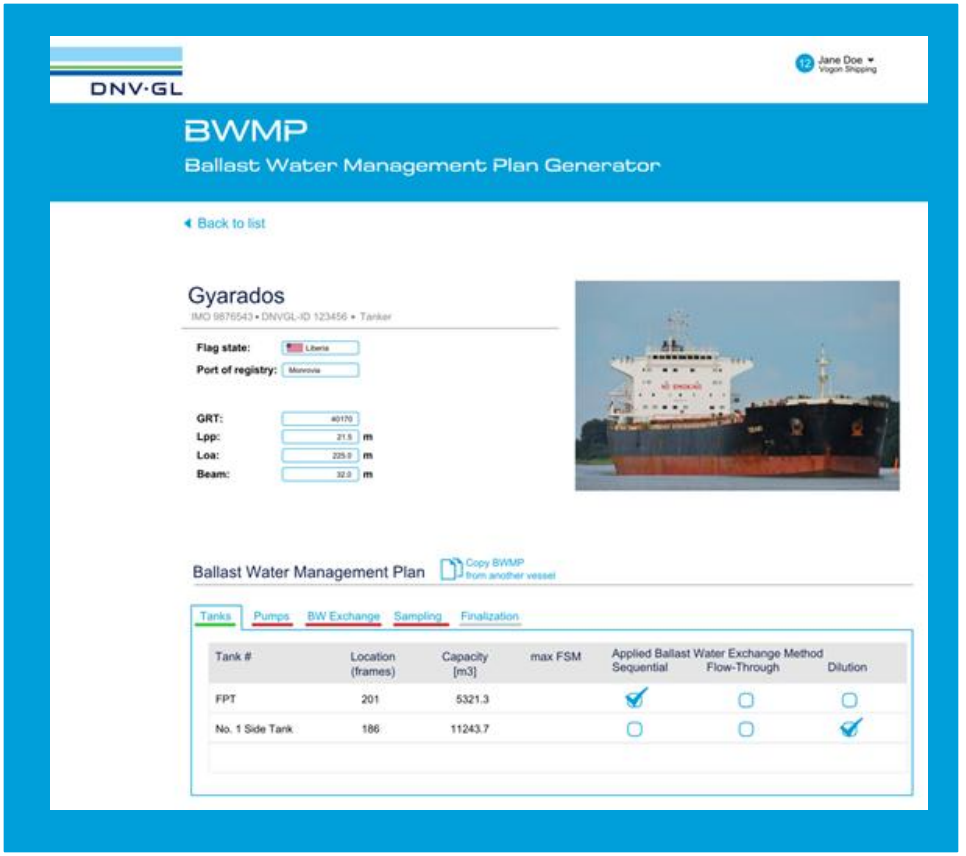
This RR is to be deleted by the surveyor, when the initial BWM survey has been carried out.

BWMP (D-1) preparation & approval process (before Sept 8, 2017)

Ballast Water Management Plan Generator

BWMP (D-1) preparation & approval process (before Sept 8, 2017)

Ballast Water Management Plan Generator



(A template to manually generate the BWMP is also available on DNV GL web site)

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Implementation schedule

Implementation of IMO D-2 standard (treatment)

Ratified on the 8 September 2016

Compliance for D-1 8 September 2017

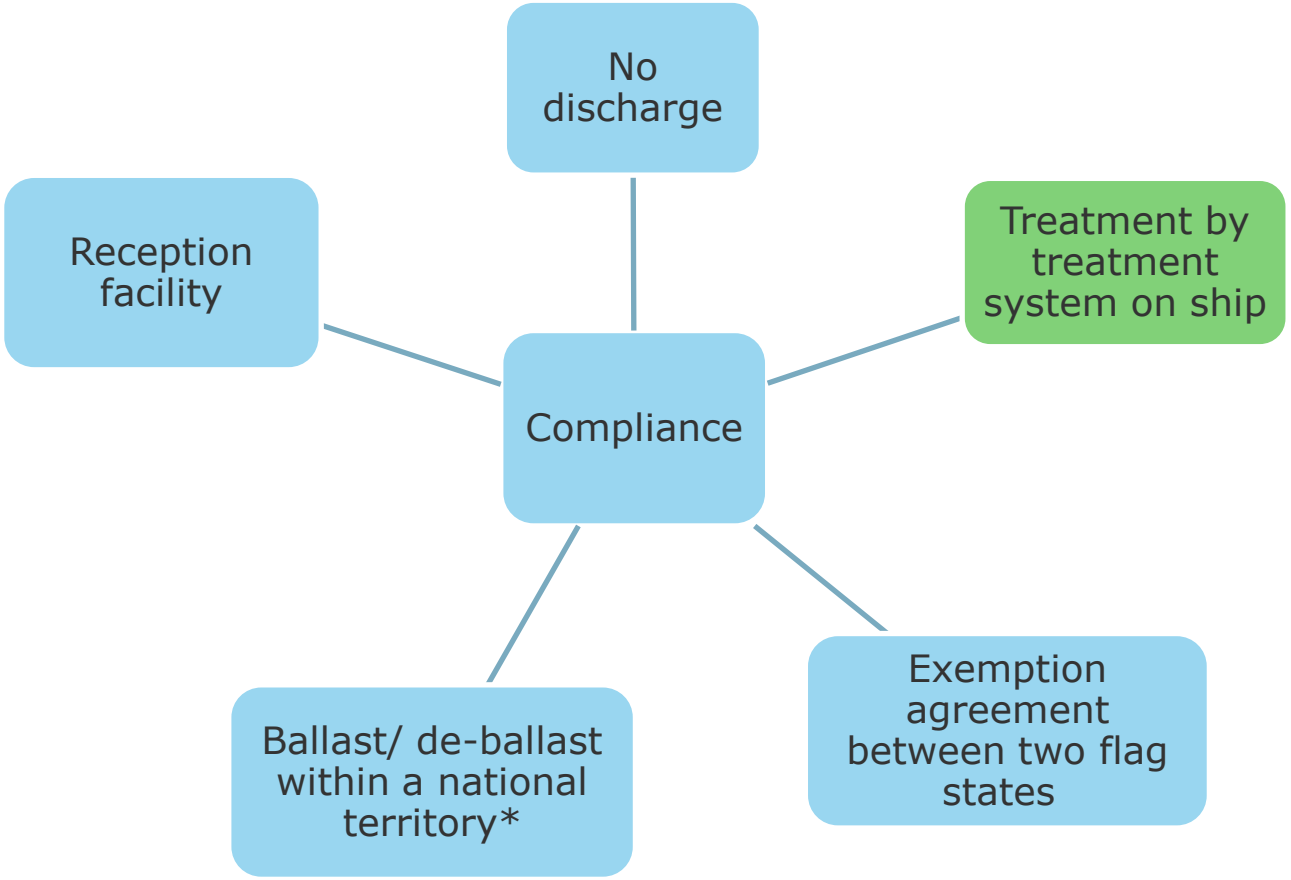
Compliance for D-2 First IOPP renewal survey after 8 September 2017, for all ships. Ships "constructed" (keel-laid) after entry into force will be required to have a treatment system installed at delivery.

USCG BWM requirements

Compliance needed at delivery and first scheduled dry-docking after 1 January 2016 for sailing ships (extensions given).

- USCG TA required (3 exists – Optimarin, AlfaLaval, OceanSaver)
- Antifouling procedures (in a management plan)
- EPA -vessel general permit (periodical sampling)

How to be in compliance



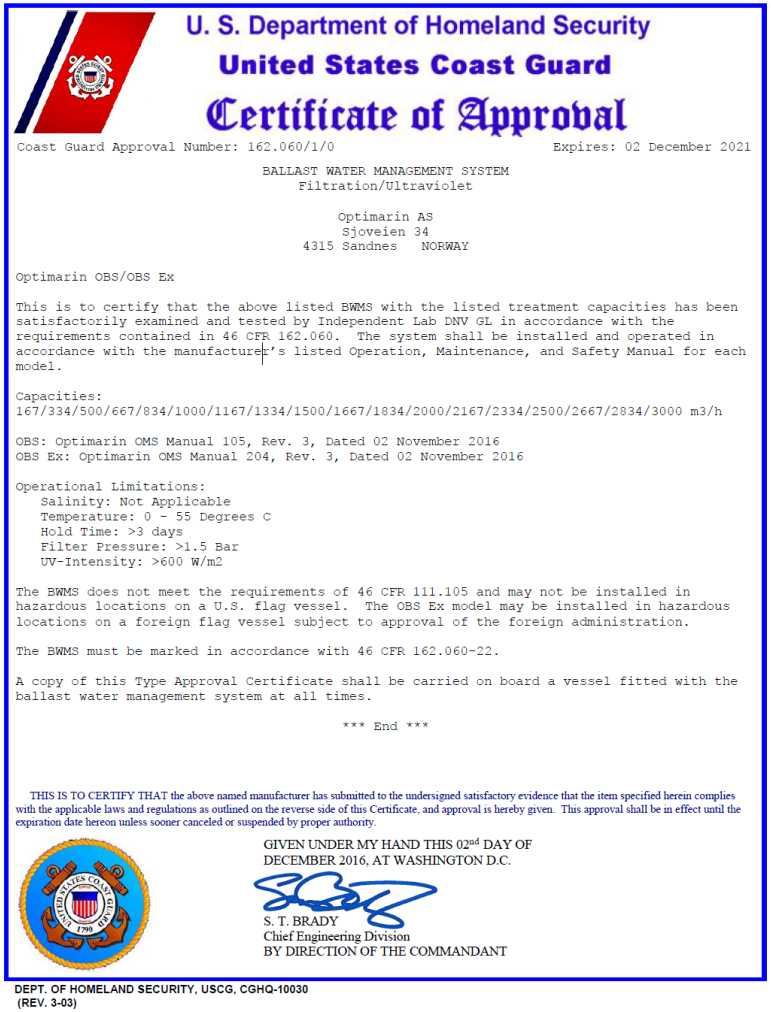
*Some national territories have requirements for treatment within the territory

Status on USCG type approval (DNV GL testing)

- Optimarin – TAC 2 December 2016
- OceanSaver – TAC 23 December 2016
- AlfaLaval – TAC 23 December 2016
- SunRui (application 20 January 2017)
- Ecochlor (application March 2017)

4 additional systems have completed LB testing (15x test cycles)

- UK
- China
- Korea
- Korea



U. S. Department of Homeland Security
United States Coast Guard

Certificate of Approval

Coast Guard Approval Number: 162.060/1/0 Expires: 02 December 2021

BALLAST WATER MANAGEMENT SYSTEM
Filtration/Ultraviolet

Optimarin AS
Sjoveien 34
4315 Sandnes NORWAY

Optimarin OBS/OBS Ex

This is to certify that the above listed BWMS with the listed treatment capacities has been satisfactorily examined and tested by Independent Lab DNV GL in accordance with the requirements contained in 46 CFR 162.060. The system shall be installed and operated in accordance with the manufacturer's listed Operation, Maintenance, and Safety Manual for each model.

Capacities:
167/334/500/667/834/1000/1167/1334/1500/1667/1834/2000/2167/2334/2500/2667/2834/3000 m3/h

OBS: Optimarin OMS Manual 105, Rev. 3, Dated 02 November 2016
OBS Ex: Optimarin OMS Manual 204, Rev. 3, Dated 02 November 2016

Operational Limitations:
Salinity: Not Applicable
Temperature: 0 - 55 Degrees C
Hold Time: >3 days
Filter Pressure: >1.5 Bar
UV-Intensity: >600 W/m2

The BWMS does not meet the requirements of 46 CFR 111.105 and may not be installed in hazardous locations on a U.S. flag vessel. The OBS Ex model may be installed in hazardous locations on a foreign flag vessel subject to approval of the foreign administration.

The BWMS must be marked in accordance with 46 CFR 162.060-22.

A copy of this Type Approval Certificate shall be carried on board a vessel fitted with the ballast water management system at all times.

*** End ***

THIS IS TO CERTIFY THAT the above named manufacturer has submitted to the undersigned satisfactory evidence that the item specified herein complies with the applicable laws and regulations as outlined on the reverse side of this Certificate, and approval is hereby given. This approval shall be in effect until the expiration date hereon unless sooner canceled or suspended by proper authority.

GIVEN UNDER MY HAND THIS 02nd DAY OF DECEMBER 2016, AT WASHINGTON D.C.

S. T. BRADY
Chief Engineering Division
BY DIRECTION OF THE COMMANDANT

DEPT. OF HOMELAND SECURITY, USCG, CGHQ-10030
(REV. 3-03)

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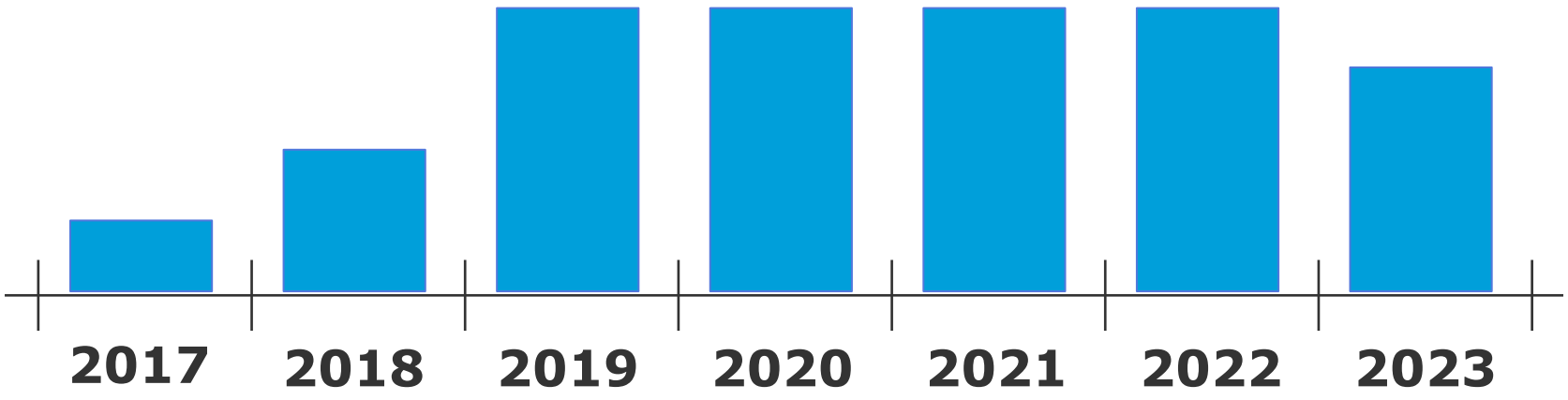
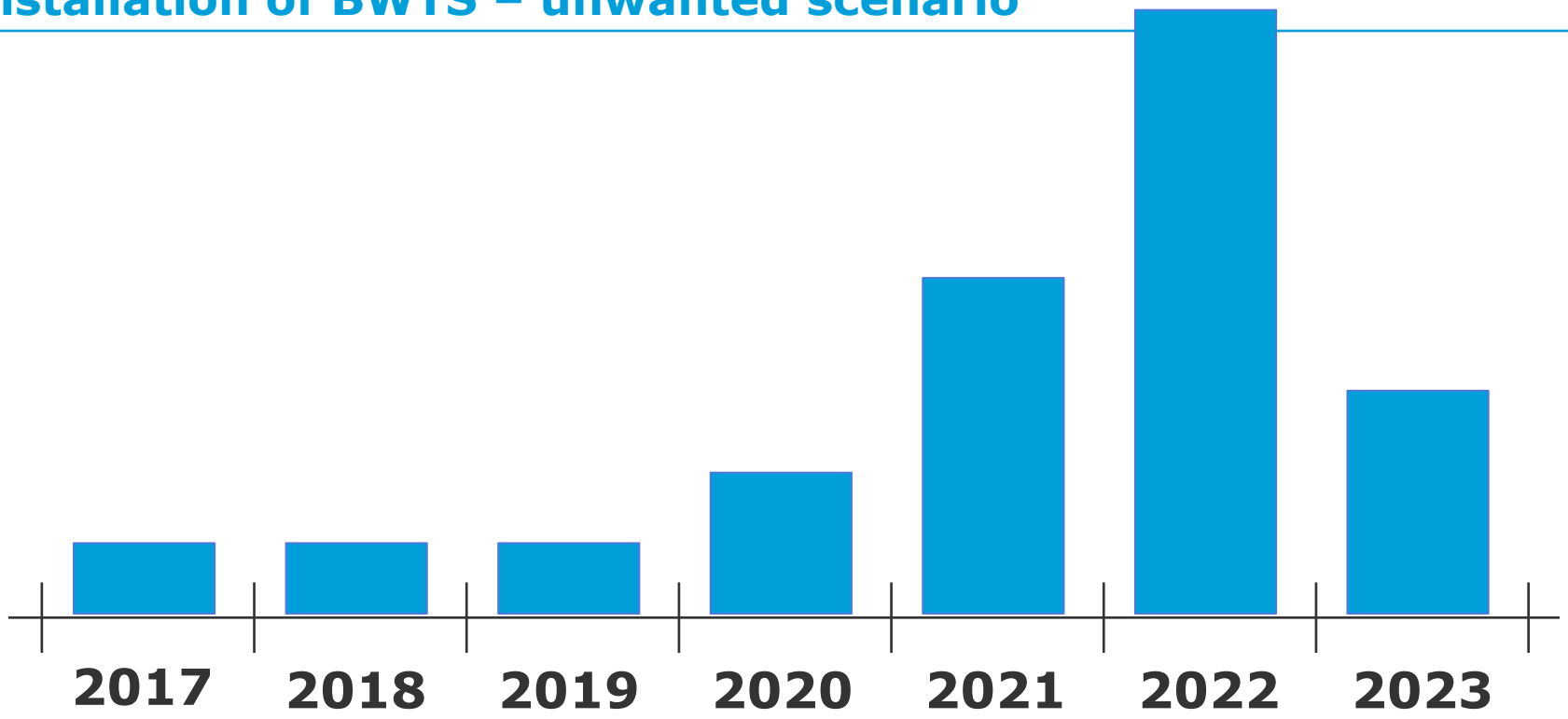
Installation of BWTS – probable scenario



Installation of BWTS – unwanted scenario



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Hot topics seen from Class – BWTS installation

- Last chance for the IOPP renewal survey
  - there is a three-month survey window for statutory surveys. This means that, for vessels whose IOPP certificate expires before 8 December 2017, shipowners have a chance to complete the IOPP.R survey earlier than 8 September 2017 and thereby waive the BWTS requirement for another five years. If the survey is completed within the three-month window, the new IOPP certificate expiry date will not change.

- De-coupling of the IOPP renewal survey

- Complete full Renewal survey (class+statutory, with DD) before 8 Sept. 2017

- Does BWTS apply for my trade?
  - Local water – national requirements
  - Between two ports (exemptions)
  - Offshore installations (seldom needed)

What are the alternative options to install BWTS?

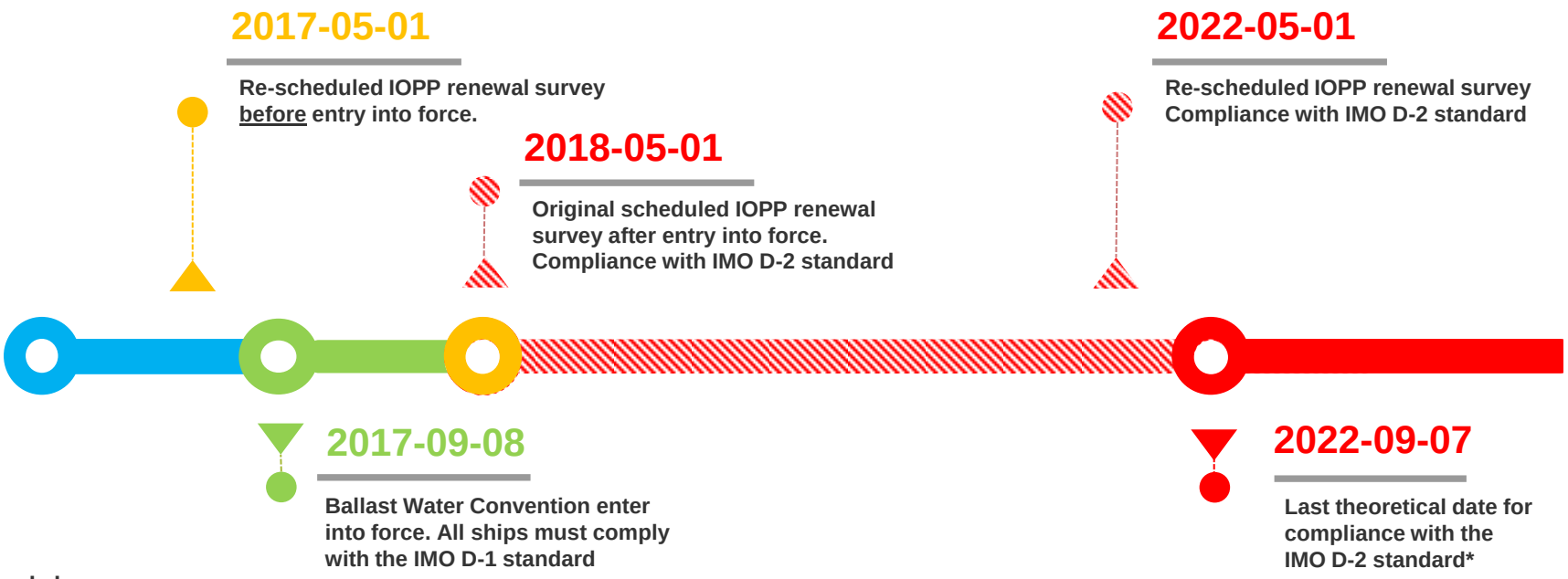
Follow the original schedule

Re-schedule the complete class renewal survey

no need for flag acceptance

Re-schedule the IOPP renewal survey

De-coupling IOPP from class renewal survey, requires flags acceptance



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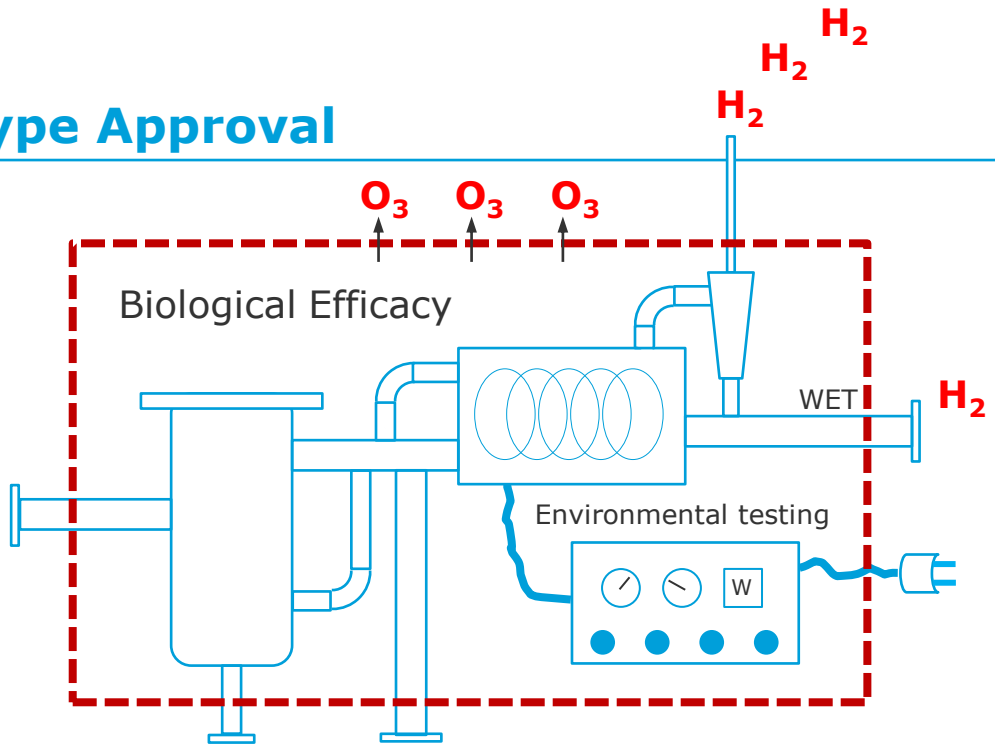
Flags accepting IOPP de-coupling

FLAG	FLAG CODE	REF	Reply	FLAG COMMENT to the de-coupling of the IOPP Certificate from HSSC with regard to the implementation of the BWM Convention	Do not support	Support	Case-by-case handling
Antigua & Barbuda	ATG	Information Notice 2016-003; 24-ATG, J-188	2016-08-03	Recomments that the harmonization of all statutory certification should be maintained. Case-by-case decision together with the RO.			X
Bahamas	BHS	Technical Alert 16-05, Rev.3	2016-11-08	~~Recomments that the harmonization of all statutory certification should be maintained.~~ Case-by-case decision together with the RO.			X
Bermuda (REG)	BMU			Position requested			
British Virgin Islands (REG)	VGB			Position requested			
Cayman Island (REG)	CYM			Position requested			
Cyprus	CYP	24-CYP, J-370	2016-12-20	Flag accepts de-harmonization/ de-coupling upon application. Flag will decide on a case-by-case basis.			X
Denmark	DNK	24-DNK, J-285	2016-11-15	Flag accepts de-harmonization/ de-coupling.		X	
France	FRA	24-FRA, J-72	2016-10-14	The flag wants to respect the harmonized certificate dates, but will decide on a case-by-case basis.			X
Germany	DEU	24-DEU, J-140	2016-11-22	Flag accepts de-harmonization / de-coupling upon application. Flag will decide on a case-by-case basis.			X
Gibraltar (REG)	GIB			Position requested			
Hong Kong	HKG	24-HKG, J-356	2016-09-27	It is not mandatory to harmonise the IOPP renewal survey with other certificate renewals.		X	
Isle of Man (REG)	IMN	24-IOM, J-276	2016-12-01	Flag supports deharmonization of the IOPP from HSSC.		X	
Liberia	LBR	24-LBR, J-529	2016-03-09	Positive. Accept the de-coupling.		X	
Lithuania	LTU	24-LTU, J-60	2016-12-08	Flag accepts de-harmonization / de-coupling upon application by owner. Flag will decide on a case-by-case basis.			X
Luxembourg	LUX	24-LUX, J-63	2016-10-21	Flag accepts de-harmonization/ de-coupling. Case-by-case decision together with the RO.			X
Malta	MLT	24-MLT, J-646	2016-11-28	Flag ready to accept de-harmonization/ de-coupling on a case-by-case authorisation within current annual survey window. Application to go via the RO.			X
Marshall Island	MHL	24-MHL, J-1240	2016-10-18	Flag accepts de-harmonization/ de-coupling.		X	
Netherlands	NLD	24-NLD, J-288; 24-NLD, J-298	2016-11-22/ 2016-01-11	Flag accepts de-harmonization/ de-coupling, if the IOPP survey will be performed inside the time window. See flag file for details.		X	
Norway	NOR	24-NOR, J-742	2016-11-18	Flag accepts de-harmonization/ de-coupling.		X	
Panama	PAN	24-PAN, J-753	2017-01-16	Flag accepts de-harmonization/ de-coupling upon application. Flag will decide on a case-by-case basis.			X
Singapore	SGP	24-SGP, J-450	2016-10-04	Flag accepts de-harmonization/ de-coupling.		X	
St Vincent and the Grenadines	VCT	24-VCT, J-154	2016-12-06	Flag accepts de-harmonization / de-coupling upon application. Flag will decide on a case-by-case basis together with the RO.			X
UK (REG)	GBR	24-GBR, J-737	2016-09-26	Flag does not support the de-coupling, but will decide on a case-by-case basis.			X

Non listed flag, or flag where no reply is listed to be handled case-by-case

This status is per 2017-01-23

Scope of Type Approval



Class focus

- safe installation
- pressure vessels
- piping
- electrical installation
- EMC
- power balance (retrofit)
- marine standard equipment
- enhanced environmental testing on control and switch boxes

(IMO)
Administration
Type Approval
MEPC.174(58)

DNV
Safety
Assessment

Class
case-by-case
plan approval

GL
Class Approval
(principal
approval)

USCG
Type Approval
46 CFR 162.060
ETV protocol

Class
requirements

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The Type Approval Certificate versus Class Rules

- BWMC require a TA cert by the Administration (flag State) or that such flag State acknowledge another Administration's TA cert, in writing (ref Reg. D-3 and G8 6.3-6.5).

- The scope of the TA certificate by the Administration is mainly Biological Efficacy (i.e. the discharged ballast water is sufficiently clean from invasive alien species) - and some environment testing.

- A "normal" TA cert or MED cert issued by Class (as delegated) is usually addressing technical performance and compliance with the ship's environment, of such component/product. Such Class TA is not a requirement for BWTS.

- The Class focus relates to safe installation and to ensure the BWTS do not interfere (unintended) with other equipment on board.

DNV GL Rules – Ballast Water Management

DNVGL-RU-SHIP-Pt6Ch7Sec1 (Jan 2017)

- Voluntary class notation BWM-E, BWM-T and Statement of Compliance BWM (E/T)
- General requirements, DocReq, etc
- Safety requirements
  - By-pass valve independent of BWTS control system
  - Plastic pipes (metallic isolation valves, pipe-criteria)
  - Two layers of safety – any part isolated and cause internal pressure increase
  - Additional environmental testing (ref Pt.4 Ch.8 Sec.3)
  - Arrangements of electrical installations in hazardous areas (ref Pt.4 Ch.8 Sec.11)
  - Hazard analysis document (for BWTS using active substances)
  - Criteria for BWTS in separate compartment (ventilation, gas alarm, exits)
  - Handling and storage of gas and liquid chemicals
  - Piping leading hazardous gas or liquid (flanges, double walled, ascending, outlet sign)
- Survey requirements (also Pt.7 Ch.1 Sec.6)
- Statutory interpretations – TRC, by-pass alarm, untreated discharge (remains)

Web page with information

Ballast water management (BWM) and biofouling

DNV GL provides a range of class and advisory services to the ballast water industry for ship owners and ballast water management system manufacturers.

SHARE: PRINT:

Contact us:

Get in touch with an expert

Send your enquiry

Get insights into the regulatory status, applicable treatment technologies and compliance solutions

Visit BWM theme page

The Ballast Water Management Convention finally reached 35% of the world GT from the signatory states when Finland ratified the Convention 8 September 201 the BWM Convention enters into force 12 months later, i.e. 8 Septembe

More on Ballast Water Management

- **Ballast Water Management theme page** — Learn more on our dedicated BWM theme page
- **Guide to approval of retrofit ballast water management system installations** — Download the 14-page PDF
- **Biofouling Management plan template** — Download the Word file
- **DNV GL Type Approval Programme for BWMS** — Download the PDF
- **BWM insights - Regulatory status, applicable treatment technologies and compliance solution** — Request your 20-page copy
- **Ballast water management plan template** — Download the Word file
- **Additional class notation - Environmental protection and pollution control** — Download the PDF

www.dnvgl.com/bwm

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DNV GL Retrofit Guidance

Guide to approval of retrofit ballast water management system installations

- Approval process
- Rules and regulations
- Expectations:
  - Piping system
  - Electrical system
  - Control system
  - Fire safety
  - Stability
  - Structure
- Document Requirements (checklist)

www.dnvgl.com/bwm

DNV GL services on Ballast Water

- Statutory and Classification services related to the BWM Convention
- Approval (FiS) of BWM plans for exchange method
- Approval of BWM plans involving treatment
  - Retrofit installations
- Services related to IMO/USCG Type approval testing
- Advisory services

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