Challenges, possible solutions in the implementation of the BWM Convention and the latest roadmap

China Classification Society

2023.8

Basic Requirements of BWM Convention

- **Regulation B-3 (MEPC.297(72)) : Compliance schedule of D-1/D-2 standard**
  - For ships constructed before 8 September 2017 but delivered after 8 September 2019, some ships have not been equipped with BWMS at the delivery. Based on regular period of 5-year IOPP certificate, the first renewal survey may not take place until a date after 8 September 2024.
  - Based on the discussion, the date of 8 September 2024 should be the deadline.

- **Amendments to Appendix II of the BWM Convention Concerning the Form of the Ballast Water Record Book (MEPC.369(80))**
  - Effective from 1 February 2025.
  - Guidance on ballast water record-keeping and reporting (BMW.2/Circ.80)
  - Guidelines for the Use of Electronic Record Books under the Ballast Water Management Convention (MEPC.372(80))
  - Guidelines for BWMP(G4) - MEPC.370(80), Guidelines for BWE(G6) - MEPC.371(80) – refer to BMW.2/Circ.80.

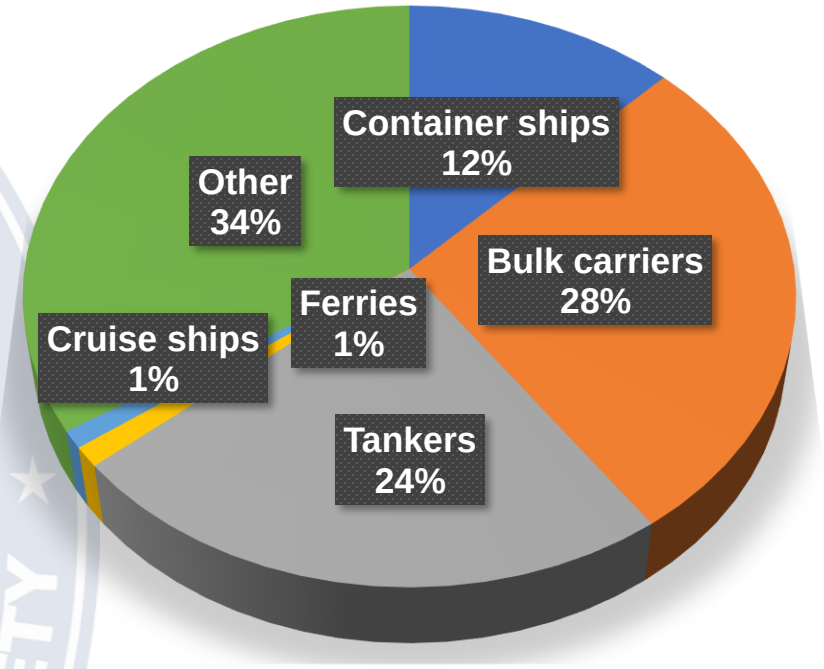
- **Requirements of BWMS Commissioning test (MEPC.325(75))**
  - BWMS commissioning test shall be carried out during the initial and additional survey (where BWMS installed retroactively and major conversion of BWMS)
    - Applicable to ship undergoes a major conversion.
    - The commissioning test shall be conducted according to commissioning test Guidance (BWM. 2/Circ. 70/Rev. 1).

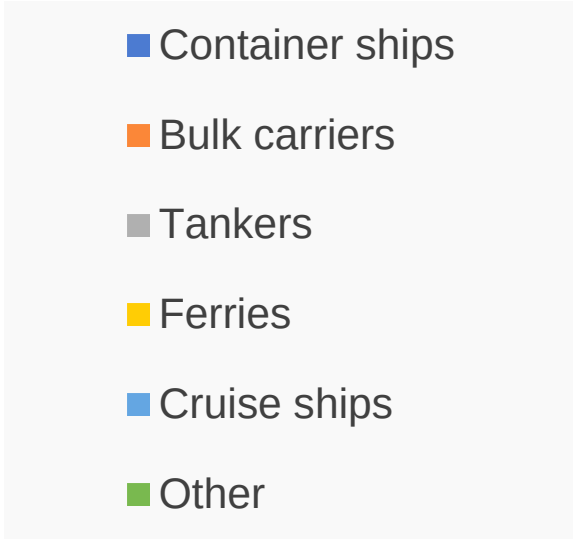
BWM.2/Circ.66/Rev. 5

Problems experienced in BWMS installed on board ships

Information from IACS voluntary BWM data collection during EBP (experience-building phase)

Number of ships issued according to D-2 standard: 16,700

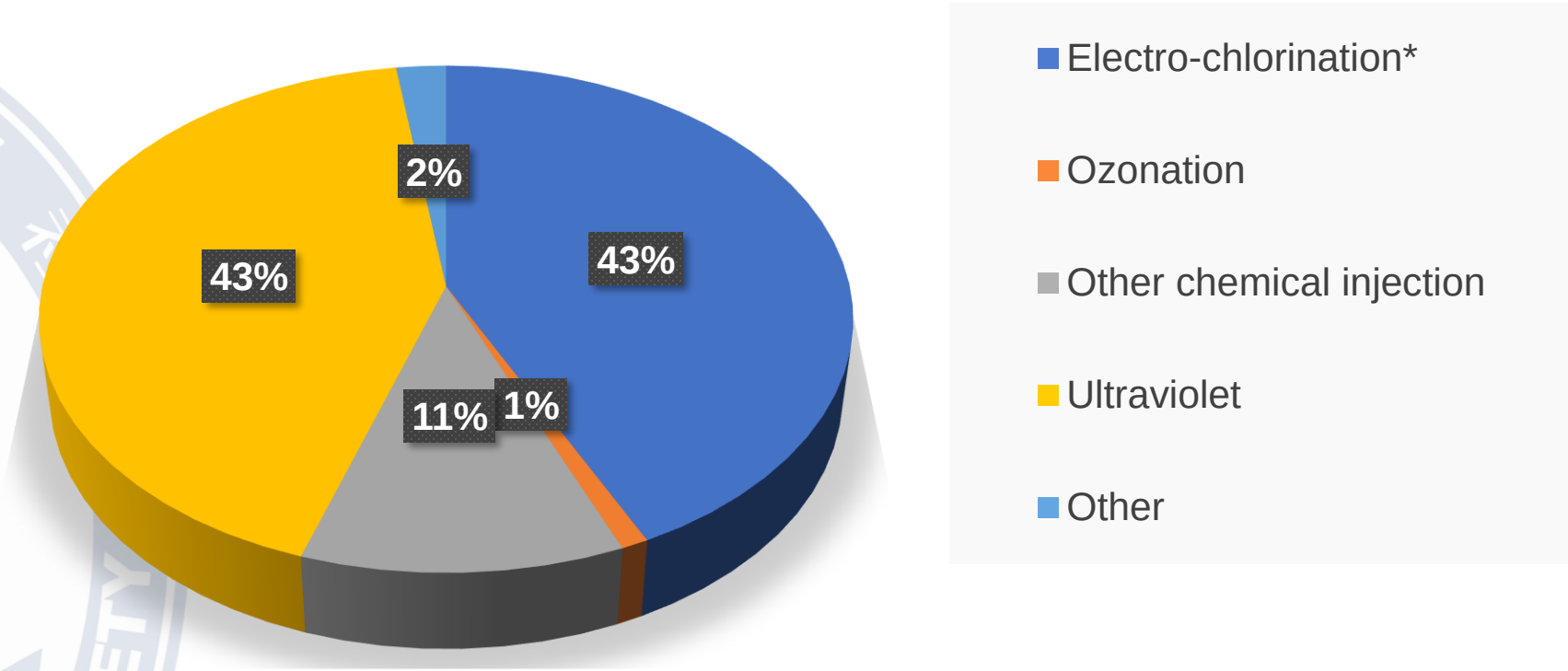




Problems experienced in BWMS installed on board ships

Information from IACS voluntary BWM data collection during EBP

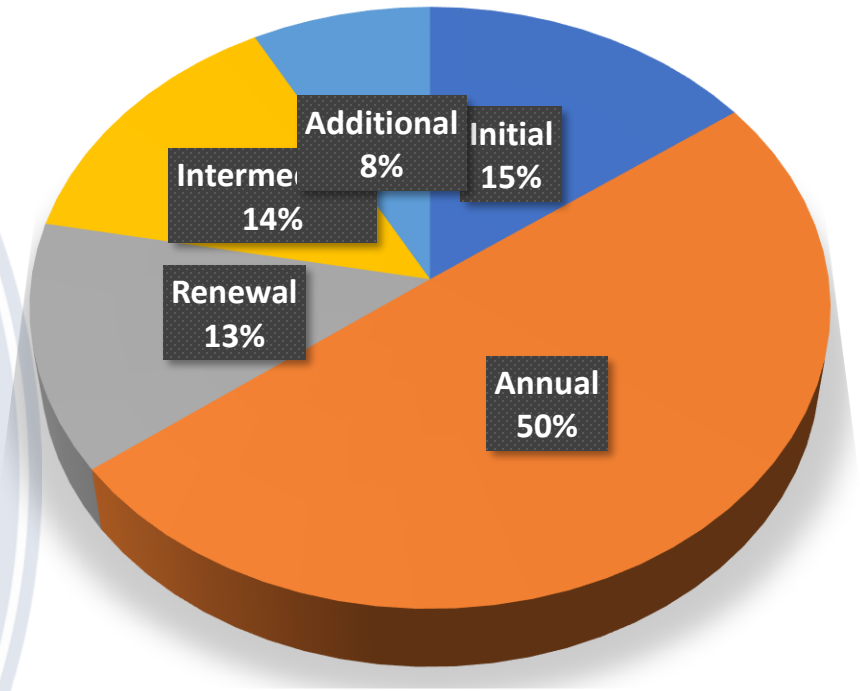
Install BWMS number: 13,580



Problems experienced in BWMS installed on board ships

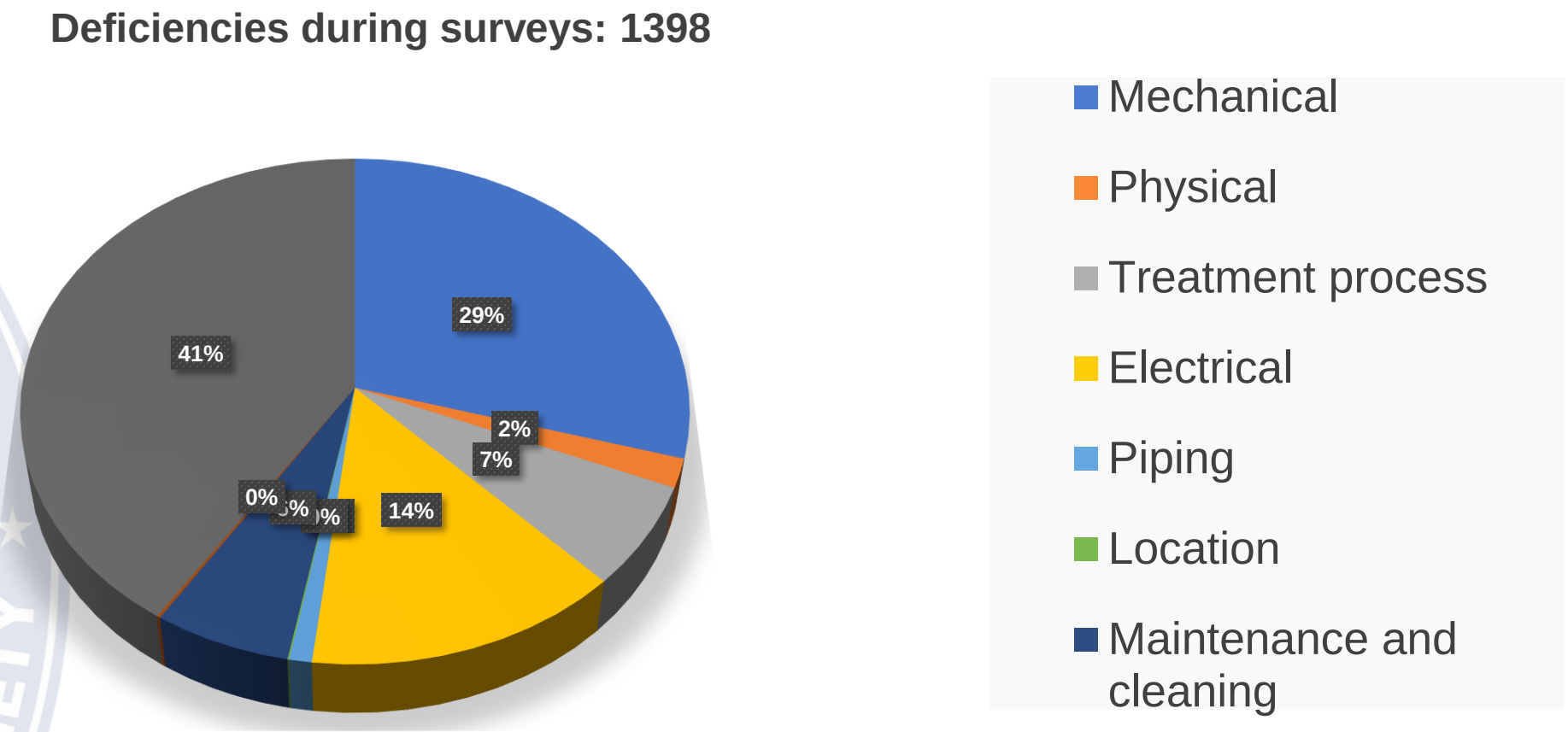
Information from IACS voluntary BWM data collection during EBP

Total survey number：171,452



Problems experienced in BWMS installed on board ships

Information from IACS voluntary BWM data collection during EBP



Problems experienced in BWMS installed on board ships

➢ Deficiencies found during surveys

- ✓ **Mechanical**
  - *Filter clogging*
- ✓ **Electrical**
  - *Missing BWMS bypass signal or vessel signal*
- ✓ **Physical**
  - *Low UV (ultraviolet) intensity*
- ✓ **Treatment process**
  - *TRO sensor malfunctions, low TRO value, etc*
- ✓ **Maintenance and cleaning**
  - *Ballast tanks not cleaned thoroughly, the sediment is not removed in time*
- ✓ **Sampling facilities**
  - *Non isokinetic sampling, sampling port location*
- ✓ **Others**
  - *Missing entries/information on BW Record Book; missing BW exchange; non-compliance with D-2 regulation; missing sampling test, etc.*

- *filter clogging due to high TSS (total suspended solids) or high algae concentration.*
  - *very frequent backflushing, very low BWMS flow rate.*
  - *beyond SDLs (System Design Limitations) of the BWMS*
- *Filter failure is the main factor of high rate of non-compliance for ≥ 50 μm organisms.*

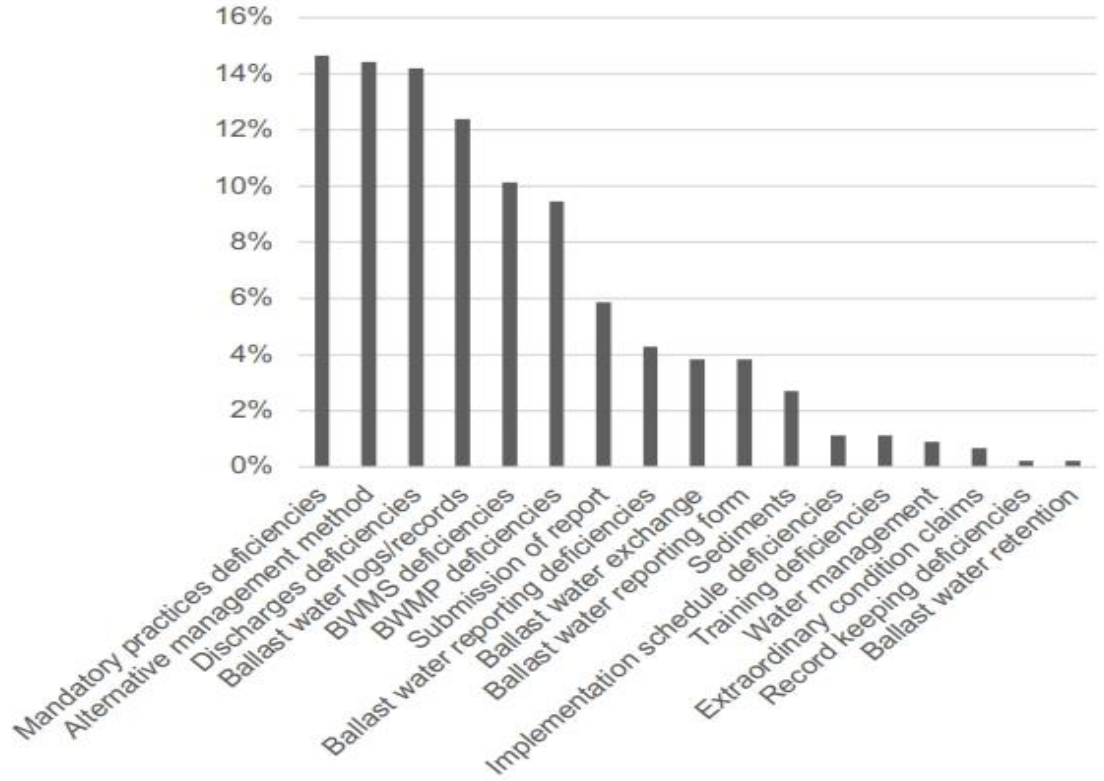
- TRO (Total Residual Oxidants) sensor
  - false alarm, unstable reading and lack of timely calibration.
  - cause inaccurate chemical dose or neutralization dose.

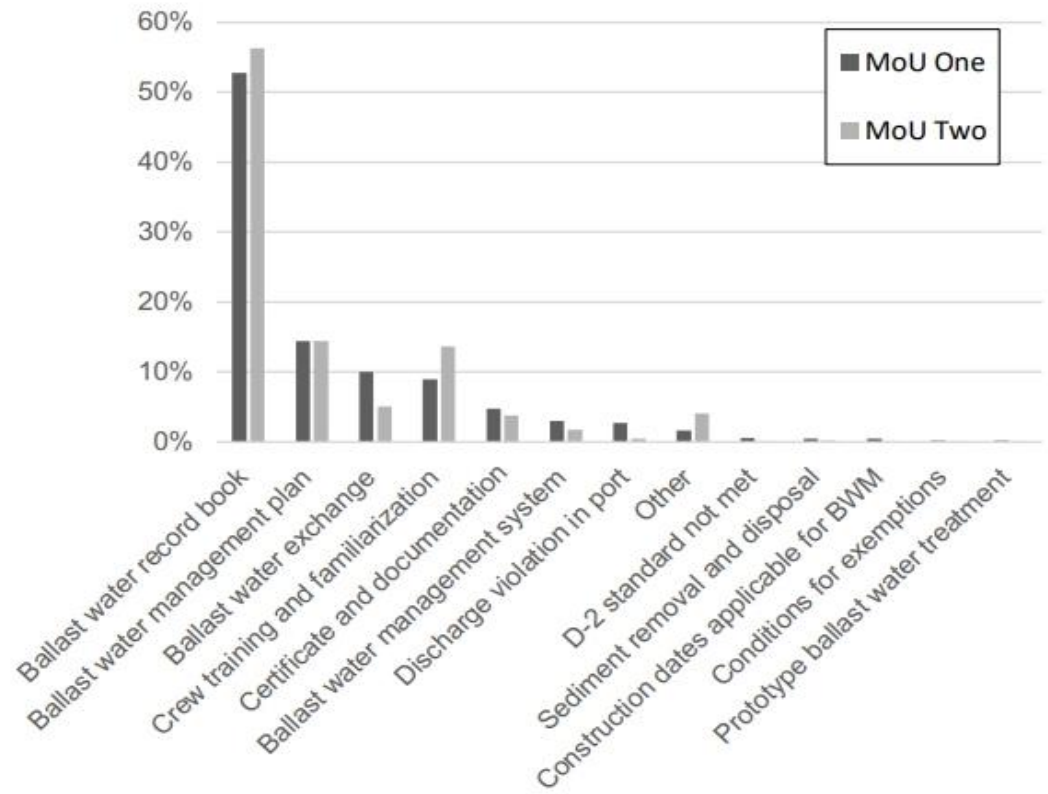
- one of the main deficiency for the retrospective installation of BWMS on existing ships.
- important part to ensure meeting D-2 standard by using BWE + BWT approach for challenging water quality.

- ship ballast pump flow rate exceeding BWMS' TRC (Treatment Rated Capacity).
- BWMP not consistent with BWRB for other ballast water management methods, such as portable water.
- The untreated ballast water remaining in the ballast water pipeline is mixed when sampling during BWMS commissioning test.

Problems experienced in BWMS installed on board ships

➢ Deficiencies found during PSC inspection





Information from IMO data collection and analysis during EBP(MEPC 78/4/1)

Problems experienced in BWMS installed on board ships

➢ Deficiencies found during PSC inspection

✓ Equipment maintenance

- Calibration
  - UV sensors, Flow meters, TRO sensors.
- Routine maintenance
  - *Total Residual Oxidants (TRO) devices most vulnerable.*
  - *Routine cleaning of filters*
  - *Routine check on neutralizers, reagents, etc. on electrolysis-based BWMS.*
- Update of BWMS logs
  - *Purchase orders and invoices for spares and consumables.*
  - *Replenishing spares onboard.*
  - *Registration of maintenance events.*

✓ Crew training

- Familiar with the Ballast Water Management Process
  - *Start and end.*
  - *Bypass.*
  - *Contingency measures.*
- Understanding the BWMS installed onboard
  - *Operational Limitations.*
  - *System Design Limitations.*
  - *Location of the equipment including D-2 sampling devices.*
- General requirements of the BWM Convention
  - *understanding of the BWM Plan.*
  - *Completion of BW record book and reporting.*

Main problems experienced in the implementation of BWM Convention

➢ BWMS commissioning test

- Ballast Water Compliance Monitoring Devices(CMDs) / Indicative analysis devices

- CMD protocol (BWM.2/Circ.78): Protocol for verification of ballast water compliance monitoring devices.
- When the indicative analysis result shows non-compliance.

Suggested solutions for commissioning test

- Local ambient water issue;
- Confirm the installation of BWMS;
- Condition of ballast tanks and pipeline;
- Two sets of BWMSs are installed case;
- Before the ballast water compliance Monitoring Devices(CMDS) verified in accordance with IMO protocol/ISO standards is available issue.

Main problems experienced in the implementation of BWM Convention

➢ **Challenging water quality (CWQ)**

- High TSS (total suspended solids) /high turbidity
- Algal blooms in certain season
- Poor tidal flushing
- high dissolved iron concentration

- Render BWMSs inoperable
- BWE+BWT approach under consideration
- Local ambient water not suitable for BWMS commissioning test

➢ **Fundamental elements in Guidance on the application of the BWM Convention to ships operating in challenging water quality**

- Timeliness & nature of the guidance.
- Parameters of the Guidance.
- Scope of application of the Guidance.
- BWMS bypass.
- B-4.3 (delay and deviation) of the Convention for BWE+BWT.
- Return to D-2 compliance following BWMS bypass/BWE+BWT.

✓ Interim guidance, end of experience-building phase (EBP) .

✓ TSS (total suspended solids) / turbidity, not temperature or salinity.

✓ Covers all issues related to Ballast Water Exchange (BWE) +Ballast Water Treatment (BWT).

✓ BWMS bypass should only be used as a last resort, in BWMP.

✓ B-4.3 not applicable.

✓ Meets D-2 standard.

Main problems experienced in the implementation of BWM Convention

➢ Challenging water quality (CWQ)

➢ **Developing Guidance on the application of the BWM Convention to ships operating in challenging water quality**

- Challenging water quality judgment conditions.
- Improve BWMS performance and reliability.
- The philosophy that BWMS selection and installation - take into the account the operating area of the ship.
- Crew familiarity with equipment and operations.
- Stakeholder roles.

✓ Application of pre-emptive BWMS bypassing.

  ✓ Location- based?

  ✓ Or BWMS-derived?

✓ For all water quality conditions?

✓ The issue of crew familiarity with shipboard equipment and operations (not about formal training).

✓ Principle of shared responsibilities, including Administrations/flag States, BWMS manufacturers, crews, ship operators, ports and port States.

Suggested solutions for CWQ

- **Challenge water quality:**
  - BWE + BWT approach as a contingency measure + BWMP + record book.
  - Holding written evidence.
  - 100% volumetric exchange, using sequential.
  - Clean water + natural ambient water exchange for commissioning test.

Main problems experienced in the implementation of BWM Convention

➢ **D-2 standard for specific ship types**

- Tugboats
- UNSP (Unmanned Non-Self-Propelled) barges
- OSVs (offshore supply vessels)
- Semi-submersibles，ect.

- Installation and operation of BWMSs impracticable.
- Verification of other approaches like temporary BWMS, etc., not clear.

➢ Possible solutions (Other measures except BWE and BWT by BWMS)

- Portable water + test report onboard + avoid mixing other untreated seawater.

Other problems experienced in ship survey and certification

➢ Confusion in the industry

➢ **Example 1**: Short-range international passenger ro ro ship (without BWMS), seal the ballast water discharge outlet with blind flange and other lead. During operation, the ballast water is not discharged but only brought back to the original place for discharge:

- BWM Article 3.2(f)-permanent Ballast Water in sealed tanks on ships, that is not subject to discharge.
- BWM regulation A-3.5 –exception
- BWM regulation B-3.7-other approach approved in principle by the Committee

➢ possible solutions

- BWMS, or using portable water + certificate according to regulation A-4.

➢ Certification problems

- Example 1 :
  - Regulation D-1/D-2/D-4-not suitable
  - Regulation A-3.5-not suitable?
  - Article 3.2(f)-not suitable?
  - Regulation B-3.7- possible? Shall be submitted to IMO for approval?

Other problems experienced in ship survey and certification

➢ Confusion in the industry

➢ **Example 2**: Semi submersible ship (without BWMS) that does not carry ballast water and sediment during occasional international navigation.

- Regulation A-4- granted to a ship on voyages between specified ports or locations; or to a ship which operates exclusively between specified ports or locations;
- BWM Article 3.2(a)-ships not designed or constructed to carry Ballast Water
- BWM.2/Circ.52/Rev.1-Guidelines for operation of ships entering or re entering waters under the jurisdiction of a single Contracting State

➢ possible solutions

- clean ballast tanks + BWMP + BWRB;
- certificate according to regulation A-4 .

➢ Certification problems

- Example 2 :
  - Regulation D-1/D-2/D-4 - not suitable
  - Article 3.2(a) - not suitable
  - Regulation A-4 - suitable?
  - Regulation B-3.7 - possible? Shall be submitted to IMO for approval
  - Exempted according to BWM 2/Circ. 52/Rev. 1, not regulations of BWM Convention

Other problems experienced in ship survey and certification

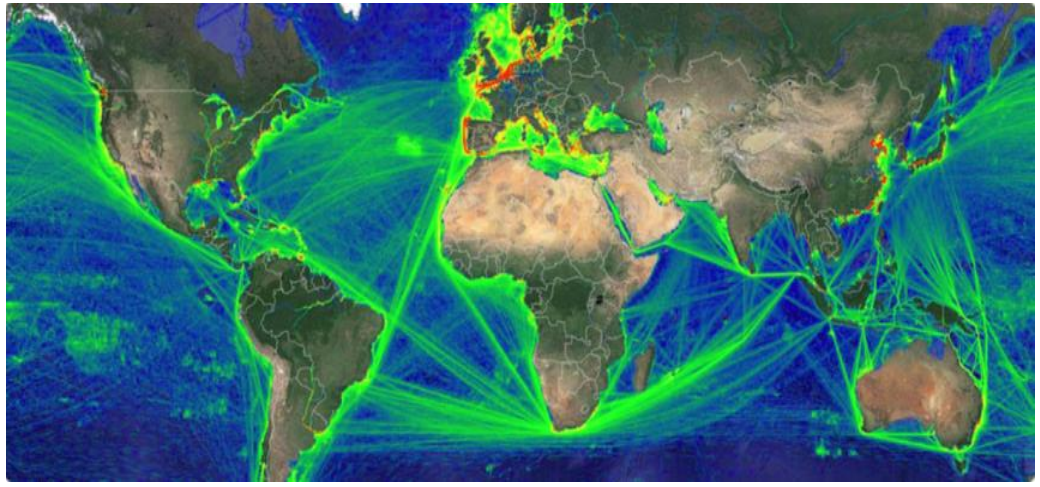
➢ Confusion in the industry

➢ **Example 3**: Ships (engineering ships) carried on board for international navigation (without BWMS)

- Deemed goods
- Is it allowed to retain untreated ballast water and sediment in ballast tank?
- Is BWMP and BWRP required?

➢ Certification problems

- **Example 3:**
  - IBWMC certificate is not required
  - Are BWMP and BWRB required?



➢ possible solutions

- Clean ballast tanks + BWMP + BWRB;
- No IBWM certificates.

Other problems experienced in ship survey and certification

➢ Confusion in the industry

- **Example 4**: Treated sewage (TS) and grey water (GW) temporarily stored in ballast tanks
  - If acceptable, how to avoid the contamination of the ballast tanks by sewage and grey water.
  - How should it reflected in the BWMP/BWRB/IBWMC.

➢ problems of D-2 compliance

- **Example 4:**
  - conditions of acceptance
  - Consequential amendments to the BWM Convention (regulations A-2 General Applicability, B-1 Ballast Water Management Plan and B-2 Ballast Water Record Book)

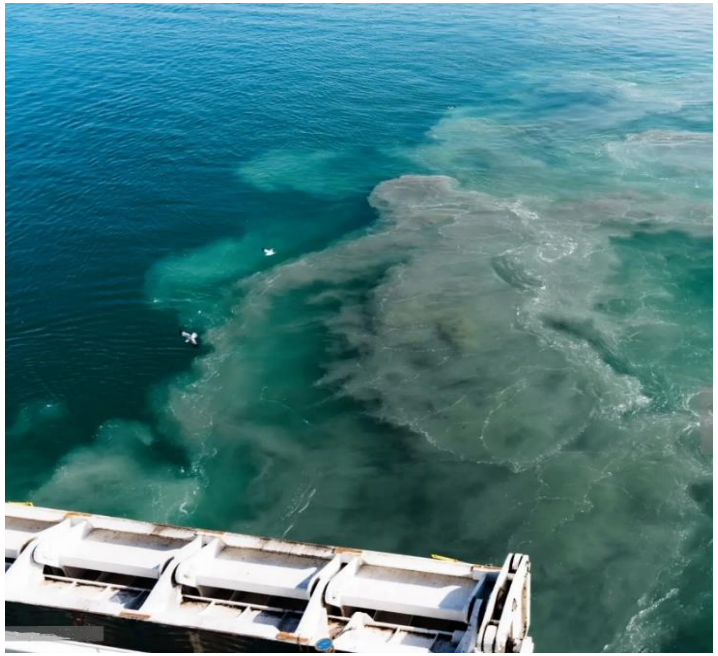
➢ IMO draft guidance on the temporary storage of grey water or treated sewage in ballast tanks & suggested solutions

- Applied to ship meets D-2, and:
  - pumps and pipelines be separated or isolated.
  - specific operational procedure:
    - change-over procedure; and
    - details of effective drainage, flushing and/or cleaning of the ballast tanks.

Other problems experienced in ship survey and certification

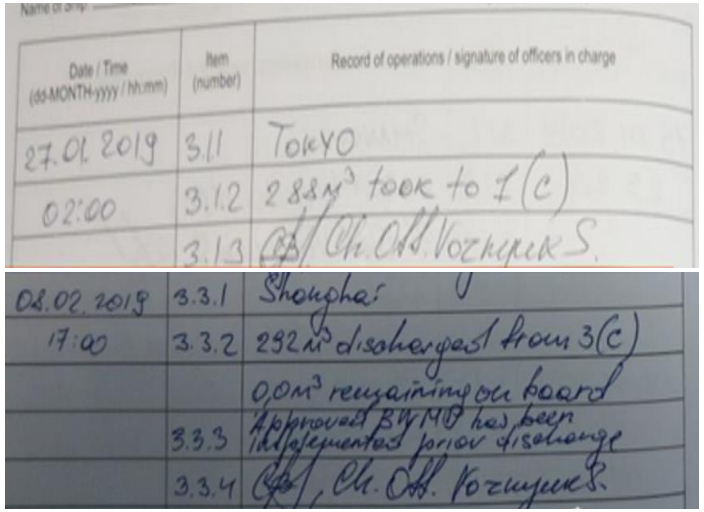
➢ IMO draft guidance & suggested solutions

- hull strength and stability of the ship.
- ballast tank clean prior to the transfer of TS and GW.
- ballast tank clean prior to the transfer of ballast water again.
- ballast tank redefined temporarily during holding TS and GW.
- untreated sewage, not permit for the time being.
- operation and management method should be described in the BWMP and recorded in BWRB.



Suggested solutions

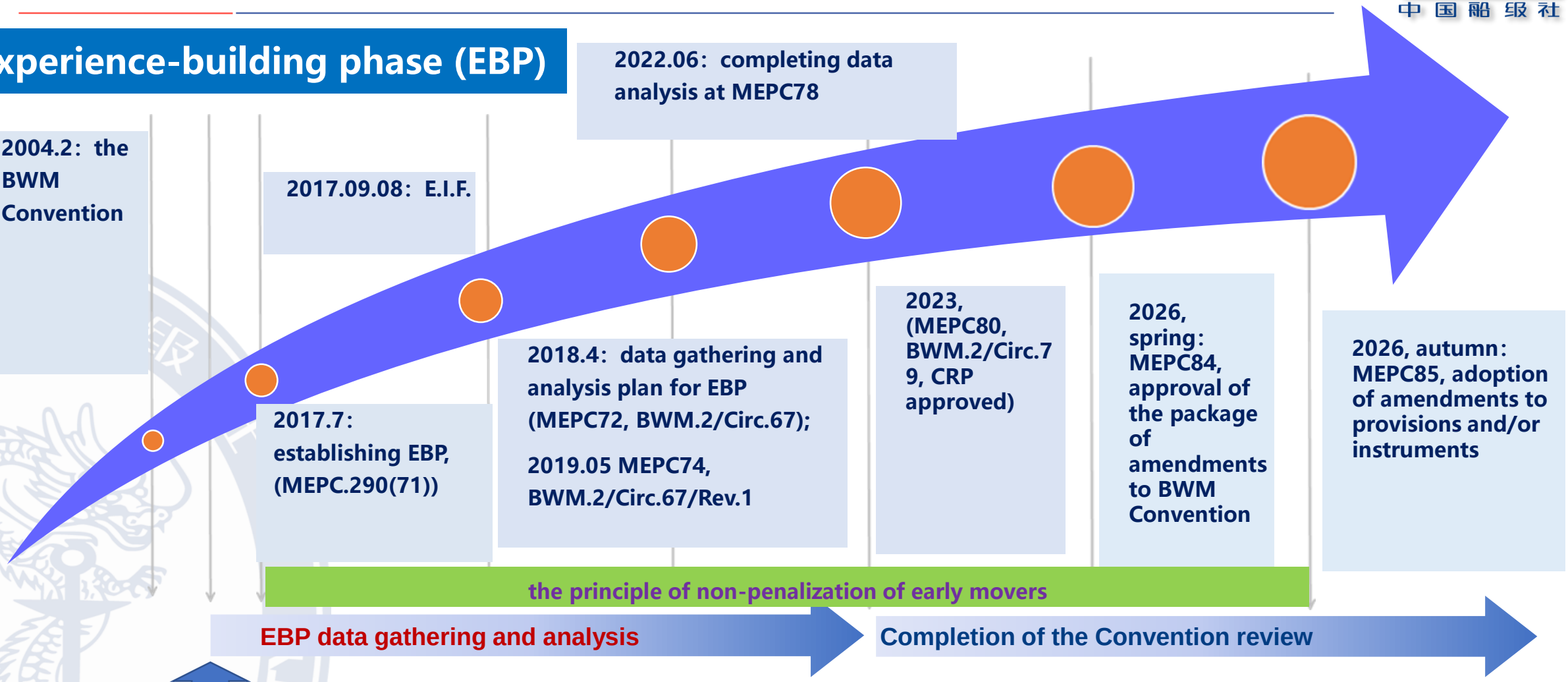
- **Other means for improvement:**
  - Improve the performance of filter.
  - Improve the performance of control and monitoring system.
  - The ballast water sampling probe - provided by BWMS manufacturers.
  - Strengthen the maintenance of BWMS.
  - Completing Ballast Water record book correctly.



Date / Time (dd-MONTH-yyyy / hh:mm)	Item (number)	Record of operations / signature of officers in charge
27.01.2019	3.1.1	TOKYO
02:00	3.1.2	288m³ took to 1(C)
	3.1.3	[illegible]
04.02.2019	3.3.1	Shanghai
17:00	3.3.2	292m³ discharged from 3(C)
		0.0m³ remaining on board
	3.3.3	Approved BWMS has been implemented prior discharge
	3.3.4	[illegible]

BWM Convention Review Plan (CRP) during EBP

Experience-building phase (EBP)



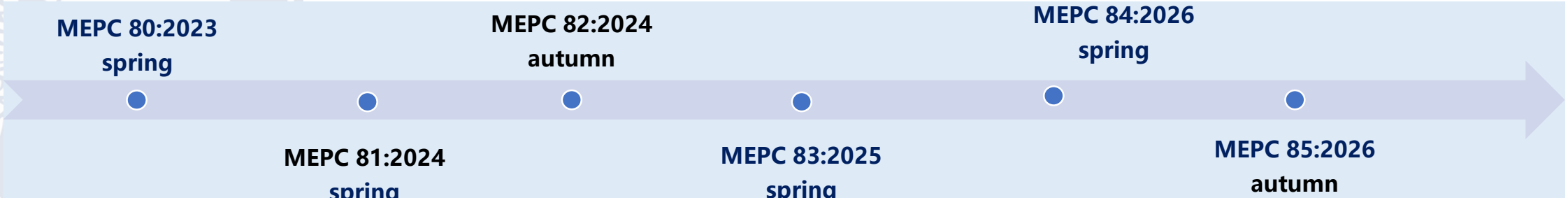
- MEPC65 -2013.05: BWM.2/Circ.42
- MEPC75 - 2020.12: BWM.2/Circ.42/Rev.2, 2020 Guidance on ballast water sampling and analysis for trial use in accordance with the BWM Convention and Guidelines (G2)

BWM Convention Review Plan (CRP) during EBP

Convention Review Plan for experience-building phase (EBP)

➢ **BWM.2/Circ.79:**

- **Purpose**: To propose a the package of amendments to BWM Convention and its instruments.
- **Organizational arrangements**: Ballast Water Review Group (BWRG), correspondence group (CG).
- **Conducting the review**: based on data gathering & analysis report developed earlier in EBP, through an objective, transparent & inclusive approach.
- **Steps:** finalization of CRP ⇨ highlighting those priority issues that need to be addressed ⇨ determination of amending specific Convention provisions and/or instruments ⇨ drafting of the package of specific amendments ⇨ recommendation of package of amendments to the Committee for approval.
- **Prioritization**: issues that should be addressed before the end of the non-penalization measures specific to the EBP.
- **Anticipated timeline:**



BWM Convention Review Plan (CRP) during EBP

Priority issues list

- ✓ developing approved sampling and analysis methods usable in PSC.
- ✓ how to improve the performance and reliability of BWMS.
- ✓ mechanisms for ship compliance in situations other than BWMS failure or challenging water quality.
- ✓ mechanisms for ship compliance in specific circumstances in which BWMS cannot be installed.
- ✓ type approval process in case of modifications to BWMS.
- ✓ crew training:
  - ✓ operational challenges,
  - ✓ maintenance challenges,
  - ✓ preventable BWMS.
- ✓ …

Thank you!

- **Fan Yunzhi,**
- **Email address: yzfan@ccs.org.cn**