

Annex C

Results of the ICS questionnaire on company approaches to the training and familiarization of personnel on ballast water management

General

Number of questions: **20**

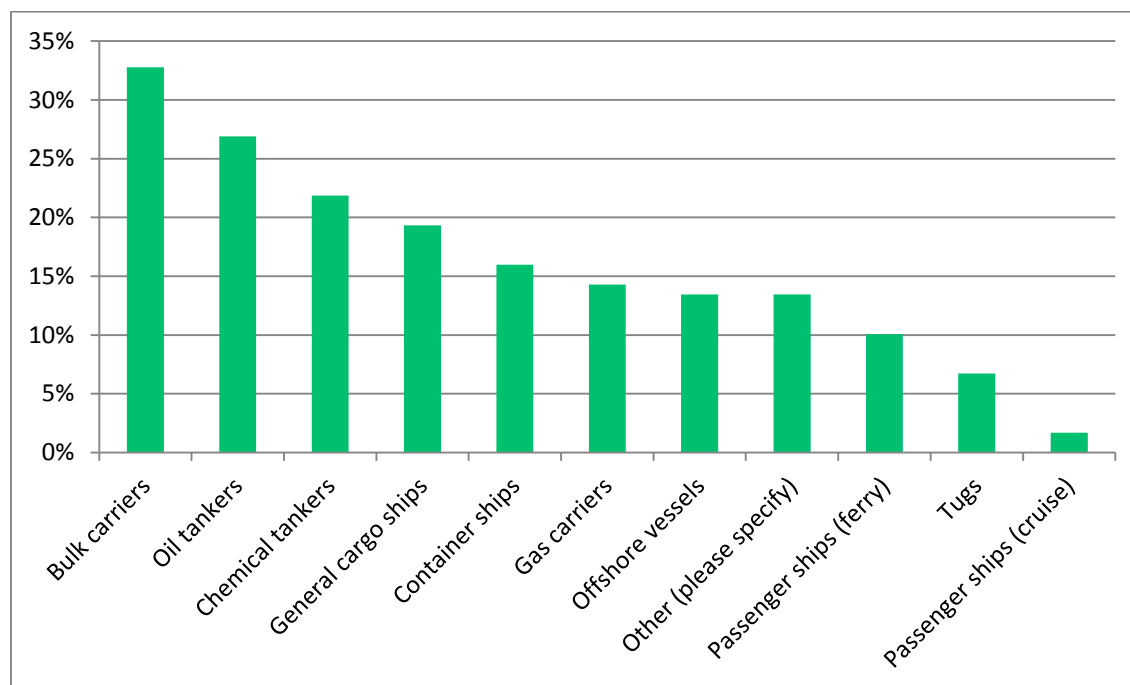
Number of respondents: **120 companies**

1. How many ships does the company operate?

Total number of ships: 5017 ships

Average number of ships in a fleet: 42

2. What type (or types) of ships does the company operate?



| | |
|-------------------------|-----|
| Bulk carriers | 33% |
| Oil tankers | 27% |
| Chemical tankers | 22% |
| General cargo ships | 19% |
| Container ships | 16% |
| Gas carriers | 14% |
| Offshore vessels | 13% |
| Other (please specify) | 13% |
| Passenger ships (ferry) | 10% |

| | |
|--------------------------|----|
| Tugs | 7% |
| Passenger ships (cruise) | 2% |

Other ships included: research vessels, fruit Juice carriers, livestock carriers, car carriers, dredgers, reefers, semi-submersible ships, ro-ro cargo ships, heavy-lift ships, yachts, offshore construction vessels.

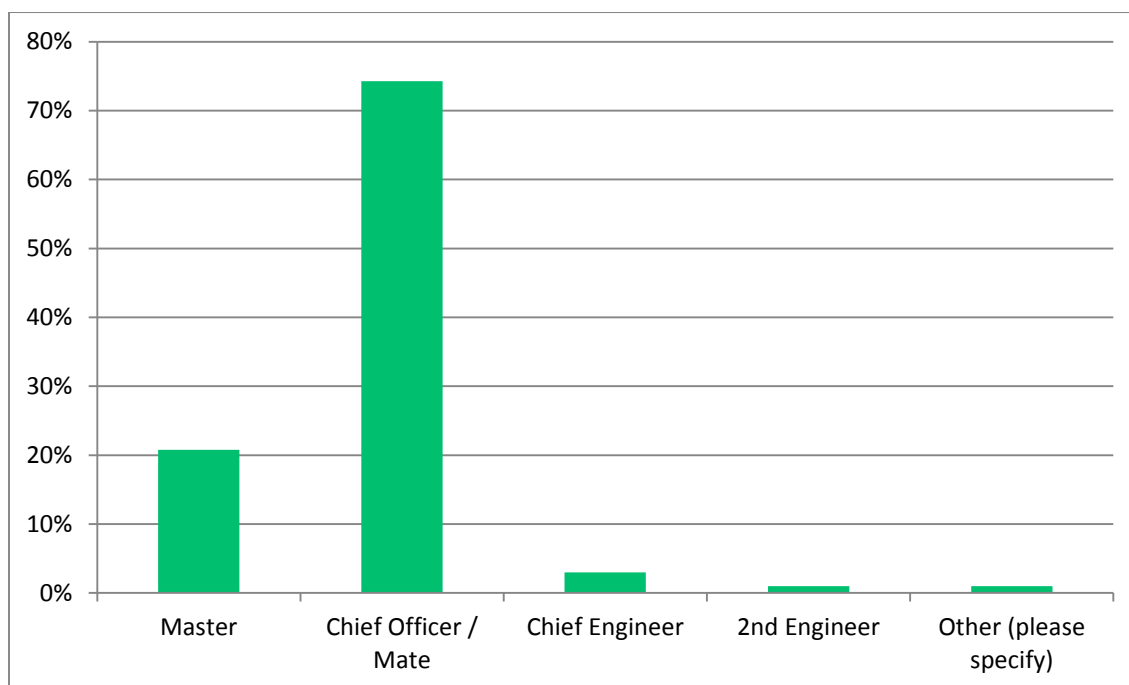
3. How many of the ships operated by the company already have ballast water treatment systems installed on board?

Total number of fitted ballast systems reported: **964**

Average number of ships with BWTS fitted on board reported per company: **8.53**

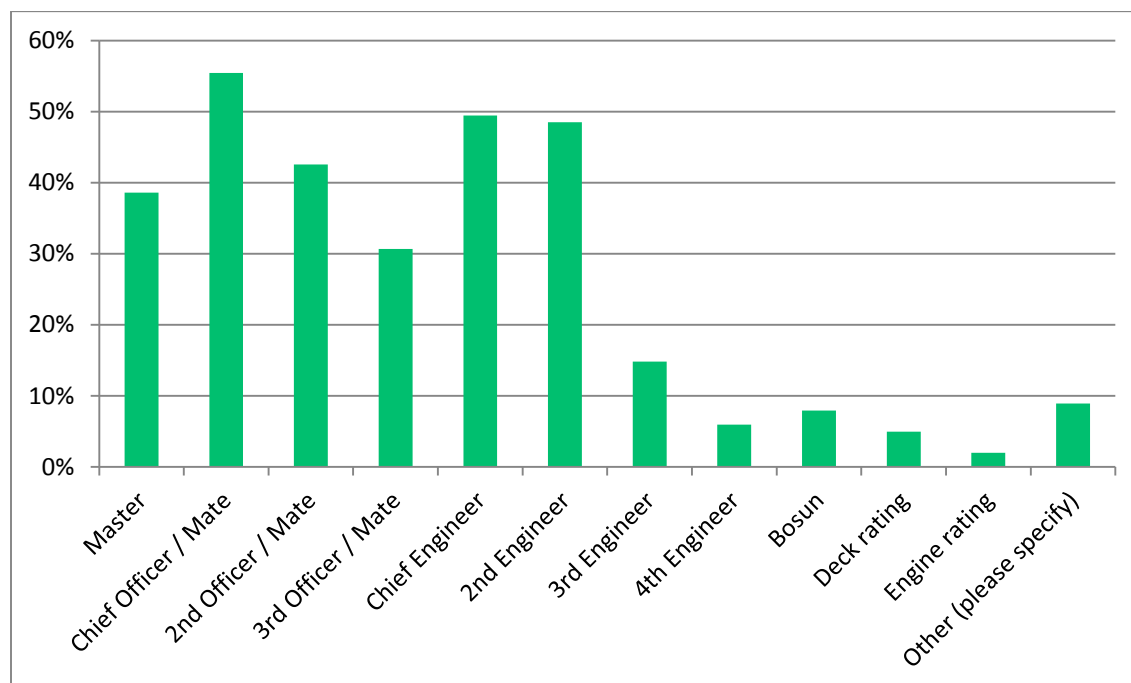
Number of companies that reported zero ships with BWTS fitted on board: **34**

4. Which rank on board ships operated by the company will normally be assigned as the designated officer in charge of ensuring the Ballast Water Management Plan is properly implemented?



| | |
|------------------------|-----|
| Master | 21% |
| Chief Officer / Mate | 74% |
| Chief Engineer | 3% |
| 2nd Engineer | 1% |
| Other (please specify) | 1% |

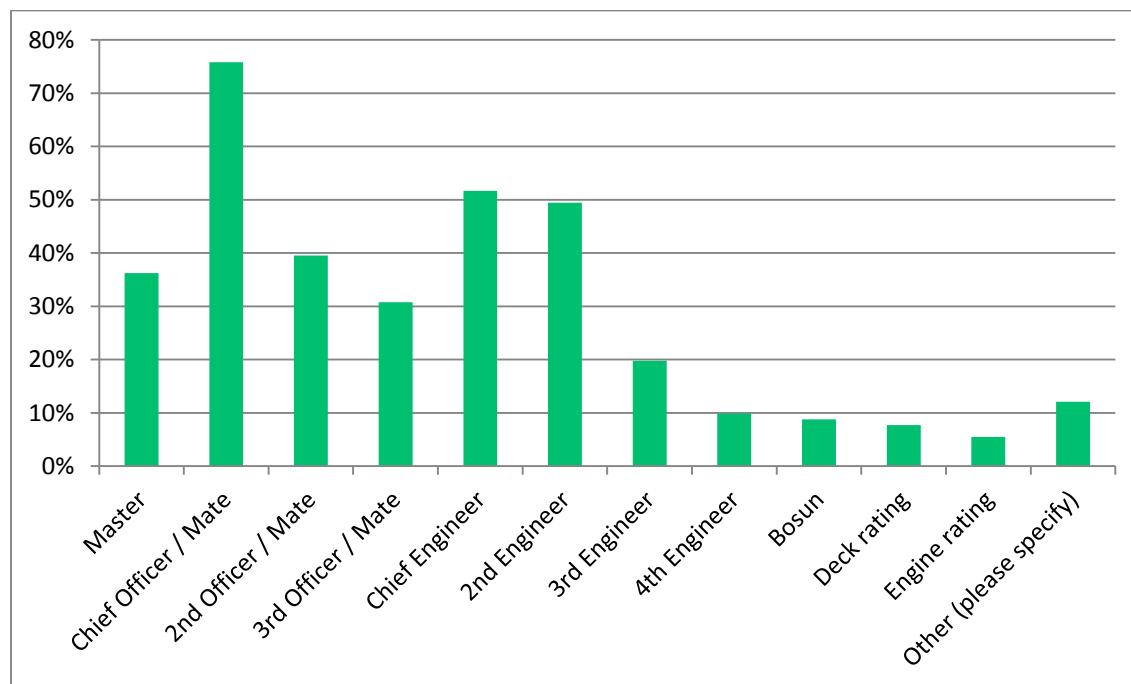
5. Which other ranks on board will normally be assigned specific duties or responsibilities by the Ballast Water Management Plan?
Please select all that apply.



| | |
|------------------------|-----|
| Master | 39% |
| Chief Officer / Mate | 55% |
| 2nd Officer / Mate | 43% |
| 3rd Officer / Mate | 31% |
| Chief Engineer | 50% |
| 2nd Engineer | 49% |
| 3rd Engineer | 15% |
| 4th Engineer | 6% |
| Bosun | 8% |
| Deck rating | 5% |
| Engine rating | 2% |
| Other (please specify) | 9% |

Other ranks included: electrician, electrical officer, electrical engineer, pumpman.

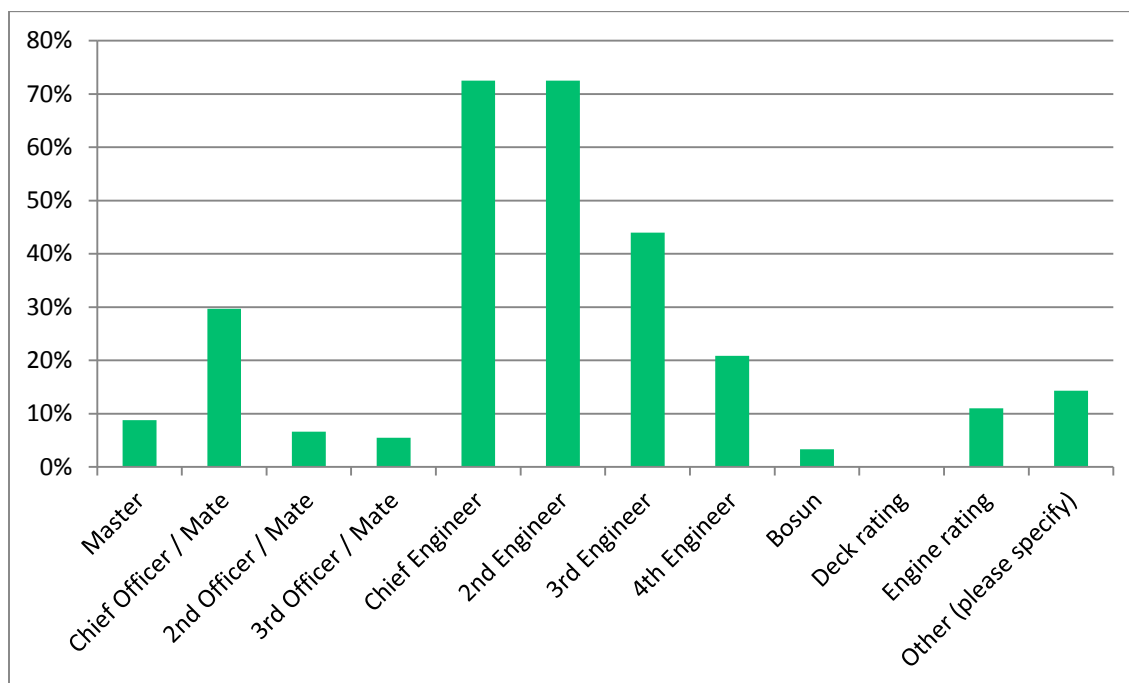
6. Which ranks on board ships operated by the company will normally have duties or responsibilities related to the operation of the ballast water treatment system?



| | |
|------------------------|-----|
| Master | 36% |
| Chief Officer / Mate | 76% |
| 2nd Officer / Mate | 40% |
| 3rd Officer / Mate | 31% |
| Chief Engineer | 52% |
| 2nd Engineer | 49% |
| 3rd Engineer | 20% |
| 4th Engineer | 10% |
| Bosun | 9% |
| Deck rating | 8% |
| Engine rating | 5% |
| Other (please specify) | 12% |

Other ranks included: electrician, electrical engineer, pumpman.

7. Which ranks on board ships operated by the company will normally have duties or responsibilities related to the maintenance of the ballast water treatment system? Please select all that apply.



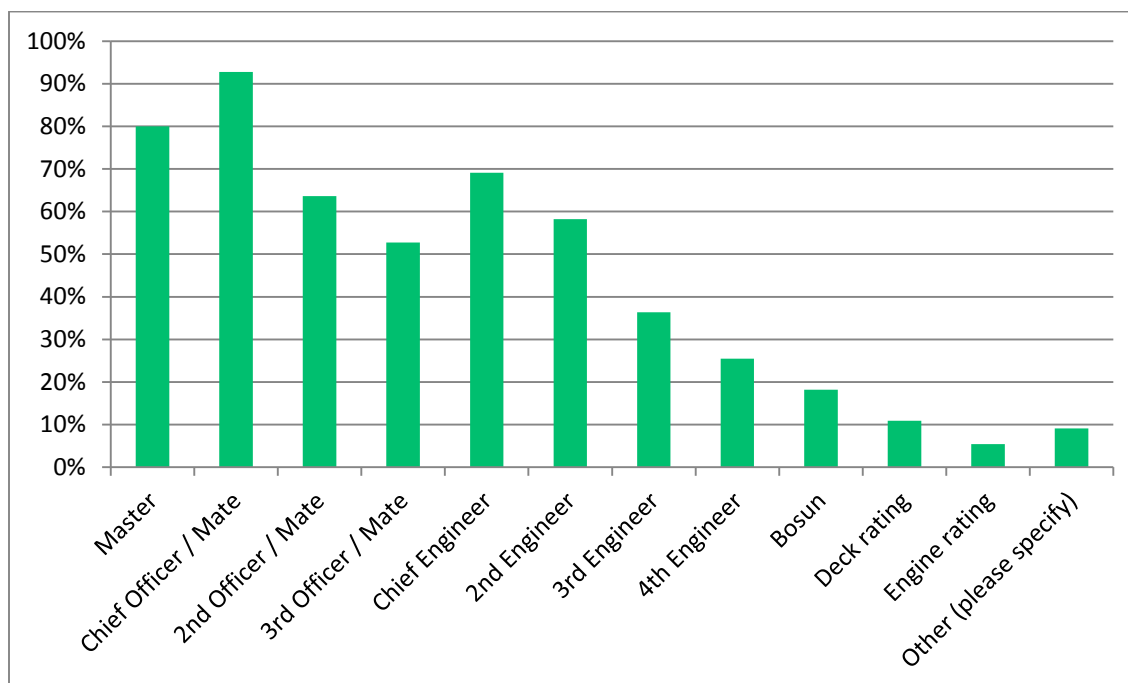
| | |
|------------------------|-----|
| Master | 9% |
| Chief Officer / Mate | 30% |
| 2nd Officer / Mate | 7% |
| 3rd Officer / Mate | 5% |
| Chief Engineer | 73% |
| 2nd Engineer | 73% |
| 3rd Engineer | 44% |
| 4th Engineer | 21% |
| Bosun | 3% |
| Deck rating | 0% |
| Engine rating | 11% |
| Other (please specify) | 14% |

Other ranks included: electrician, electrical officers, electrical engineer.

8. Has the company identified the need to include some information on specific arrangements, equipment or procedures related to ballast water management as part of the shipboard familiarization provided to personnel upon joining a ship operated by the company?

| | |
|-----|-----|
| Yes | 66% |
| No | 34% |

9. Which ranks will normally receive some form of shipboard familiarization related to ballast water management? Please select all that apply.



| | |
|------------------------|-----|
| Master | 80% |
| Chief Officer / Mate | 93% |
| 2nd Officer / Mate | 64% |
| 3rd Officer / Mate | 53% |
| Chief Engineer | 69% |
| 2nd Engineer | 58% |
| 3rd Engineer | 36% |
| 4th Engineer | 25% |
| Bosun | 18% |
| Deck rating | 11% |
| Engine rating | 5% |
| Other (please specify) | 9% |

Other ranks included: electrician, electrical officer, electrical engineer.

10. Please briefly list some of the areas/topics being addressed by shipboard familiarization related to ballast water management:

| RESPONDENT | LIST OF SOME OF THE AREAS/TOPICS |
|------------|--|
| 1 | Rules about water exchange |
| 2 | Ballast water management plan |
| 3 | <ul style="list-style-type: none"> - Specific ballast water management plan - Ballast water management procedures - Ballast water treatment specifics & operation - Ballast handling procedures - Ballast sampling procedures |
| 4 | Record keeping |
| 5 | Record book |
| 6 | Requirements of BWM Convention Record keeping |
| 7 | Specific ballast water treatment system on board Special local requirements |
| 8 | Ballast water exchange, ships ballast system, position of the air and sounding pipes, different methods of Ballast Water Exchange, method of on-board ballast water record keeping and reporting, 7. Time calculation required for the BWE, The requirements of IMO Res. 868(20) and Ballast Water Management Plan. |
| 9 | Operation/ instructions of the board system Operational limitations Troubleshooting for the BWTS and possible solutions Reporting requirements of the ballast handling in national authorities |
| 10 | Maintenance & Consumables Regulatory compliance Testing |
| 11 | Ship specific Ballast Water Management Plan (and operation of treatment system if applicable) |
| 12 | <ul style="list-style-type: none"> - Applicable regulations for a number of countries, concerning the obligation to operate the BWTS or if ballast water exchange can be performed. - Actions in case that the BWTS is inoperable. - How to better schedule the available time for ballast water treatment. - However, it should be mentioned that the BWTS of Company ships most of the time are inoperable, because of very often defects and limited availability of technicians to attend the vessel or availability of spare parts. |
| 13 | <ol style="list-style-type: none"> 1. Mechanical operation of the BWTS 2. Legislation 3. Procedures 4. Emergency plans |

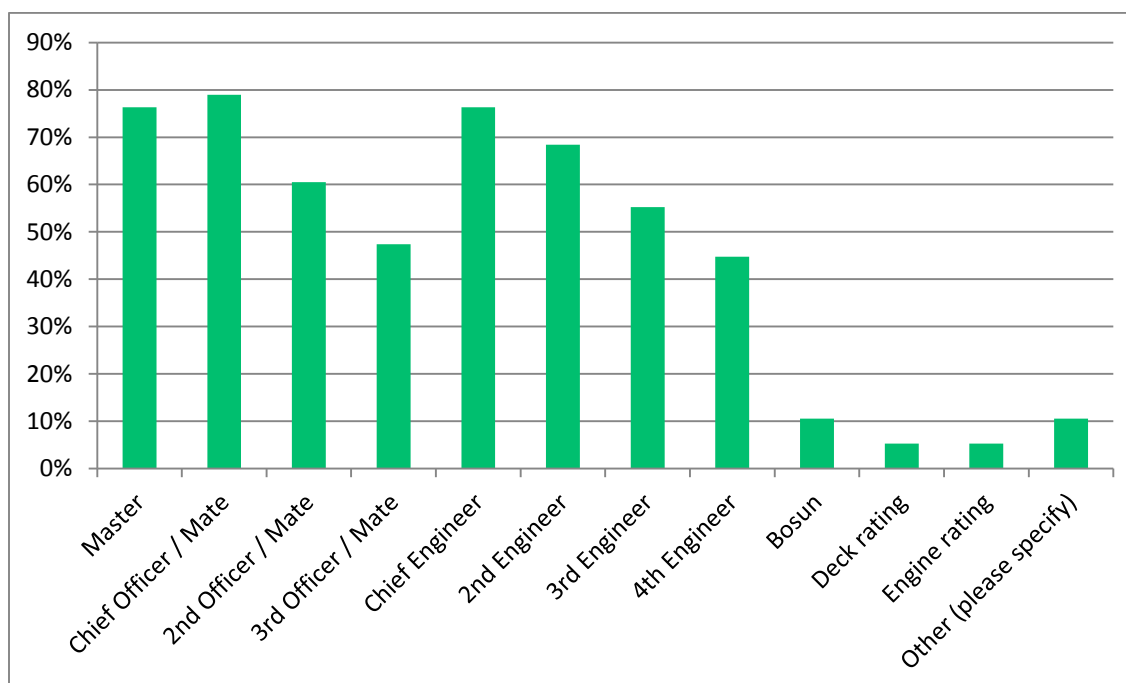
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|----|---|
| 14 | Location of all machinery, operation console, maker's manual, IMO Rules, Class Regulations, Alarms, Troubleshooting, maintenance intervals, spare parts list |
| 15 | <ul style="list-style-type: none"> - Safety Systems. - Interlocks. - Measuring Device for control/operation purposes. - Sampling procedures. - Critical Spares. - Operating limitations. - Quality control on receipt of consumables and reagents. - Maintenance. - Operation (Ballasting/De-Ballasting/Stripping). |
| 16 | Operation, maintenance |
| 17 | Tank plan, capacity, valves/vents, trim & stability |
| 18 | On system how it operates, typical characteristics of plant in different types of ports, types of water, temperature, loading condition, past history of equipment break downs, things to keep in mind during operation and practical hands on experience with joining staff, if time permits - ballasting or de-ballasting takes place in that port. |
| 19 | environment, methodology |
| 20 | Type and constrains of the system |
| 21 | Knowledge of the procedures and requirements for ballast water exchange as per class approved ballast water management plan |
| 22 | <p>Provisions for crew training and familiarization, including:</p> <ul style="list-style-type: none"> .1 requirements of a general nature regarding Ballast Water Management; .2 training and information on ballast water management practices; .3 ballast water exchange; .4 ballast water treatment systems; .5 general safety considerations; .6 the Ballast Water Record Book and maintenance of records; .7 the operation and maintenance of installed ballast water treatment systems; .8 safety aspects associated with the particular systems and procedures used onboard the ship which affect the safety or human health of crew and passengers and/or the safety of the ship; .9 precautions for entering tanks for sediment removal; .10 procedures for the safe handling and packaging of sediment; and .11 storage of sediment. |
| 23 | Environmental protection |
| 24 | Proper use, record keeping , maintenance as per schedule |
| 25 | Operation of the system. starting stopping |

| | |
|----|--|
| 26 | Familiarization with the convention, Part D1, Part D2, International requirements, check for local requirements |
| 27 | Operation, Maintenance, Trouble shooting |
| 28 | exchange requirements/ documentation/administration |
| 29 | regulations, zones, type of installation (if on board already) |
| 30 | BWE documentation, BWE reporting, BWMS operation, |
| 31 | <ul style="list-style-type: none"> - Familiar with duties in the implementation of Ballast Water Management particular to the ship. - Familiar with the ship's Ballast Water Management plan. - Trained in and familiar with the items described in the training requirements in the Ballast Water Management plan. |
| 32 | As per BWMP |

11. Has the company identified the need for relevant personnel to receive additional training related to ballast water management?

| | |
|-----|-----|
| Yes | 46% |
| No | 54% |

12. Which ranks on board ships operated by the company will normally receive additional training? Please select all that apply.



| | |
|------------------------|-----|
| Master | 76% |
| Chief Officer / Mate | 79% |
| 2nd Officer / Mate | 61% |
| 3rd Officer / Mate | 47% |
| Chief Engineer | 76% |
| 2nd Engineer | 68% |
| 3rd Engineer | 55% |
| 4th Engineer | 45% |
| Bosun | 11% |
| Deck rating | 5% |
| Engine rating | 5% |
| Other (please specify) | 11% |

Other ranks included: electrical officer, engine cadet, deck cadet, shore-based personnel.

13. Please briefly list some of the areas/topics being addressed by additional training related to ballast water management:

| RESPONDENTS | LIST OF SOME OF THE AREAS/TOPICS |
|-------------|---|
| 1 | Ballast water exchange, plant maintenance |
| 2 | - BWM requirements - Ballast water treatment |
| 3 | BWT system + operation + procedure |
| 4 | Regulations |
| 5 | 1. Alternatives in case of failure of system 2. Operational limitations 3. Recording and reporting requirements |
| 6 | Troubleshooting Maintenance Operation |
| 7 | Seagull training modules, CBT based |
| 8 | 1. Operation 2. Troubleshooting |
| 9 | Operation, maintenance |
| 10 | Legal compliance related issues |
| 11 | Use is made of CBT training covering the whole concept |
| 12 | Different types of systems installed on our ships. Their working principal, types of challenges faced on our ships, types of other issues which may come up, regulatory requirements, company guidelines, contingency plan and risk assessment in case of any break down, hands on experience on various types of BW treatment systems installed in our training center in India and Manila for various nationalities of ship staff who work on our ships and other company ships. |
| 13 | Procedure not in place yet |
| 14 | US requirements |
| 15 | Operations, Regulation, Maintenance, Trouble Shooting, Response in case of breakdown |
| 16 | Fault finding |
| 17 | BWE documentation, BWE reporting, BWMS operation, maintenance |
| 18 | Training provided by the ship's staff, as per the Ballast Water Management Plan: Ships' officers and ratings engaged in ballast water exchange at sea must be aware of what is expected of them and should be trained in and familiarised with the following: - ship's pumping arrangements including ballast arrangements - locations of air and sounding pipes of all ballast tanks - positions of all ballast tank suctions and pipelines - overboard discharge arrangements and openings for release of water on deck |

| | |
|----|--|
| | <ul style="list-style-type: none"> - inspection and maintenance for ensuring that sounding pipes are clear and non-return devices and air pipes are in good order - times and circumstances required to undertake the various ballast water exchange operations - methods used for ballast water exchange at sea, the related safety precautions and associated hazards - method of on board ballast water record keeping, reporting and recording of routine soundings - location and suitable access points for sampling purposes |
| 19 | <ul style="list-style-type: none"> - Introduction to BWM and the convention - Operational Aspects of Shipboard Ballast Water Management - Survey and Certification Aspects of Ballast Water Management - Compliance Monitoring and Enforcement |

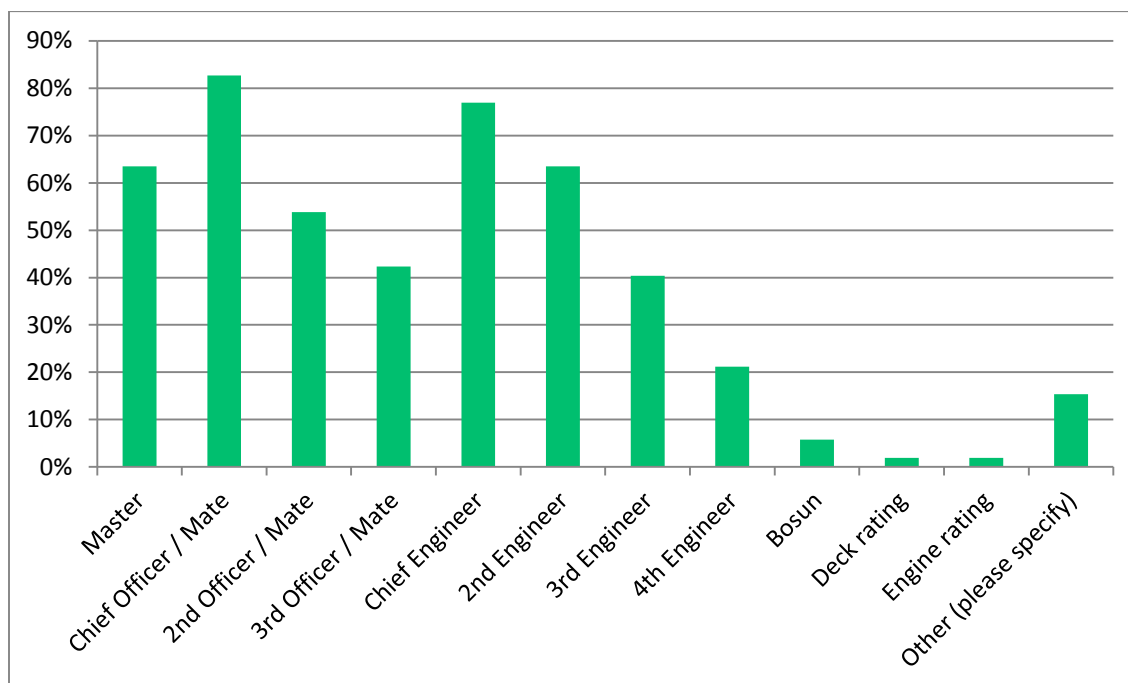
14. Have any manufacturers of ballast water treatment systems proposed type-specific training to the company?

| | |
|-----|-----|
| Yes | 50% |
| No | 50% |

15. Does the company intend to arrange for any personnel to receive type-specific training on the ballast water treatment systems installed on board its ships?

| | |
|-----|-----|
| Yes | 68% |
| No | 33% |

16. Which ranks would the company identify to receive type-specific training on the ballast water treatment systems installed on board its ships? Please select all that apply.



| | |
|----------------------|-----|
| Master | 63% |
| Chief Officer / Mate | 83% |
| 2nd Officer / Mate | 54% |
| 3rd Officer / Mate | 42% |
| Chief Engineer | 77% |
| 2nd Engineer | 63% |
| 3rd Engineer | 40% |
| 4th Engineer | 21% |
| Bosun | 6% |
| Deck rating | 2% |

| | |
|------------------------|-----|
| Engine rating | 2% |
| Other (please specify) | 15% |

17. Is the company considering arranging for a limited number of personnel to receive the type-specific training with the intention of then cascading the training throughout its fleet (i.e. trickle down training)?

| | |
|-----|-----|
| Yes | 82% |
| No | 18% |

18. Would the training available from the manufacturer normally be included in the installation price of the ballast water treatment system?

| | |
|-----|-----|
| Yes | 71% |
| No | 29% |

19. Please briefly list the areas/topics included in any type-specific training available from the manufacturer(s):

| RESPONDENTS | LIST OF SOME OF THE AREAS/TOPICS |
|-------------|--|
| 1 | Plant management and maintenance |
| 2 | - System design & principles - Normal maintenance - Troubleshooting - Normal operation |
| 3 | Operation Maintenance Troubleshooting |
| 4 | Usually onboard training and familiarization during and after commissioning. Some offer computer based training. |
| 5 | Overview, maintenance and operation |
| 6 | 1. Operation 2. Troubleshooting |
| 7 | - Safety Systems. - Interlocks. - Measuring Device for control/operation purposes. - Sampling procedures. - Critical Spares. - Operating limitations. - Quality control on receipt of consumables and reagents. - Maintenance. - Operation (Ballasting/De-Ballasting/Stripping). |
| 8 | Operation, maintenance |
| 9 | Operation, maintenance and repair |

| | |
|----|--|
| 10 | All as stated above as we have type specific BW treatment systems already installed in our own training centers which are open to any company and any sea farer who wants to do such training. |
| 11 | Operation of BWTS and Maintenance procedures including trouble shooting in case of alarms. |
| 12 | Troubleshooting, general operation, maintenance |
| 13 | Maintenance & Troubleshooting book for crews, high alarm, EM'CY mode alarm, calibration guide for sensors |
| 14 | Training being given by manufacturer is often of doubtful quality |
| 15 | System function System operational procedures Operational Limitations |
| 16 | Operation and maintenance of the BWTS. |

20. Please identify the matters addressed in the BWMPs of the company that are accompanied by provisions on crew training and familiarization.

| | |
|---|-----|
| General requirements for ballast water management | 86% |
| Ballast water exchange | 79% |
| Ballast water treatment systems | 63% |
| Safety considerations related to ballast water management | 74% |
| Maintenance of records and the Ballast Water Record Book | 77% |
| Operation and maintenance of the ballast water treatment system | 64% |
| Procedures and safety considerations related to sediment storage or removal | 66% |
| Other (please specify) | 12% |

Other matters included: local regulations (e.g. USA, Australia, Canada etc.), contingency plans in case of failure of BWTS, designated areas of exchange as per IMO GISIS update, risk assessment and contingency plans when BWTS does not work.