

Introduction

This survey is part of MAX1 Studies, a six-month study on shipboard machinery space waste streams and Oily Water Separator (OWS) technology. To learn more and get involved, visit the study's website at www.max1studies.org

Note that this study has been built to skip questions that do not apply to you based on your previous responses, in order to minimize total survey time. Therefore, your survey may be somewhat different than your colleagues.

Thank you for participating and please forward the survey to others that may be interested!

Introduction

* 1. Would you consider yourself to be (or have you ever been) a member of the marine industry?

- Yes
- Sort of
- No (please specify your industry)

Introduction

* 2. What is your involvement in the marine industry? (select all that apply)

- | | | |
|---|--|--|
| <input type="checkbox"/> Regulatory | <input type="checkbox"/> Master | <input type="checkbox"/> Surveying |
| <input type="checkbox"/> Port state control | <input type="checkbox"/> Engine department | <input type="checkbox"/> Classification |
| <input type="checkbox"/> Operations | <input type="checkbox"/> Chief Engineer | <input type="checkbox"/> Recycling/disposal |
| <input type="checkbox"/> Shipowner | <input type="checkbox"/> Legal | <input type="checkbox"/> Environmental response |
| <input type="checkbox"/> Financial | <input type="checkbox"/> Shipbuilding/repair | <input type="checkbox"/> NGO/professional organization |
| <input type="checkbox"/> Design | <input type="checkbox"/> Manufacturing/equipment | <input type="checkbox"/> Agency |
| <input type="checkbox"/> Maintenance | <input type="checkbox"/> Education | <input type="checkbox"/> Student |
| <input type="checkbox"/> Deck department | <input type="checkbox"/> Insurance | |
| <input type="checkbox"/> Other (please specify) | | |

Introduction

*** 3. How long have you been involved with the marine industry?**

- <1 year
- 1-4 years
- 5-10 years
- 11-20 years
- 21-30 years
- 31-40 years
- >41 years

Introduction

*** 4. Where do you live?**

- North America
- South America
- Europe
- Africa
- Asia
- Australia or New Zealand

MARPOL

*** 5. Do you know what MARPOL is?**

- Yes
- No

MARPOL

For the following questions, recall that Annex I of MARPOL is the International Maritime Organisation's (IMO) regulation for the prevention of pollution by oil, and includes the management of shipboard oily bilge water and oil residues (sludge) in Chapter 3 of Annex I.

MARPOL

*** 6. Do you think MARPOL regulations are generally effective at preventing shipboard pollution?**

- Yes
- No
- Not sure

*** 7. Do you think MARPOL Annex I regulations are generally effective at preventing accidental oil pollution?**

- Yes
- No
- Not sure

*** 8. Do you think MARPOL Annex I regulations are generally effective at preventing intentional oil pollution?**

- Yes
- No
- Not sure

MARPOL

*** 9. In your opinion, what percentage of ocean-going ships' crews violate MARPOL Annex I?**

- 0%
- 1%-10%
- 11%-20%
- 21%-30%
- 31%-50%
- 51%-70%
- 71%-80%
- 81%-90%
- 91%-99%
- 100%
- Don't know

MARPOL

*** 10. Which of the following statements describe your personal opinion regarding MARPOL Annex I compliance on board ships today? (you may select more than one)**

- Only a few bad apples do not follow MARPOL Annex I requirements
- Very few ship's crews are deliberate polluters, but there is noncompliance as a result of lack of knowledge
- The industry needs to do a better job at coming up with technical and human factors solutions
- Ship's crews have no clue what they are doing
- Ship's crews are not being given the right guidance on the application of MARPOL Annex I
- Ship's crews are starting to get the message regarding MARPOL Annex I compliance
- Today ship's crews are doing a good job and know what they are doing
- Whistleblowing has become a cottage industry
- Whistleblowers are mostly honest crew members
- Most Owners want to do the right thing, but they have not been able to get their hands around the problem
- Most Owners simply do not care
- Most Owners do the right thing
- Many Owners continue to encourage their crews to only pay lip service to MARPOL Annex I
- Criminal prosecution is a proper way to enforce MARPOL Annex I
- Civil fines instead of criminal prosecution makes more sense
- Nobody knows what is really going on, me included
- MARPOL Annex I is broken
- MARPOL Annex I is something the industry should be proud of and has reduced pollution to a very significant extent
- There are too many MARPOL Annex I regulations
- Other (please specify)

MARPOL

11. Do you have any specific suggestions to improve MARPOL Annex I regulations?

Waste Stream Management

*** 12. Do you know what bilge water is?**

- Yes
- No

*** 13. Do you know where shipboard oil residues (sludge) comes from?**

- Yes
- No

Waste Stream Management

*** 14. How much of an effect do you believe improper management of oily bilge water and oil residues (sludge) has on the environment?**

- Negligible
- Local polluter
- Significant polluter
- Major worldwide effect

Waste Stream Management

*** 15. Are there any valid reasons for pumping untreated oily bilge water or oil residues (sludge) overboard?**

- Yes
- No
- Not sure

Comment (optional)

*** 16. Are there any legal reasons for pumping untreated oily bilge water or oil residues (sludge) oil overboard?**

- Yes
- No
- Not Sure

Comment (optional)

Waste Stream Management

*** 17. Are there enough shore reception facilities for disposal of Annex I wastes?**

- Yes
- No
- Not Sure

*** 18. For existing shore reception facilities for Annex I wastes, is service satisfactory?**

- Yes
- No
- Not sure

*** 19. Is shore disposal of Annex I wastes currently prohibitively expensive?**

- Yes
- No
- Not Sure

20. What is the biggest problem with shore reception facilities regarding Annex I wastes?

Waste Stream Management

*** 21. Should incineration of sludge within ECAs (Emission Control Areas) be prohibited?**

- Yes
- No
- Not sure

Comment (optional)

Waste Stream Management

*** 22. Do you have shipboard waste stream management experience within the past 2 years?**

- Yes, as a crew member or ship operator
- Yes, but not as a crew member or ship operator
- No

Waste Stream Management: Shipboard Experience

*** 23. What type of vessel do you have the most waste stream management experience on within the past two years?**

- Passenger ship
- Tanker
- Bulk carrier
- Container ship
- Offshore industry vessel
- Mobile offshore drilling unit (MODU)
- Fisheries
- Government vessel
- Other (please specify)

Waste Stream Management: Shipboard Experience

*** 24. How do you dispose of your MARPOL Annex I wastes?**

- Only shore facilities
- Only processing through OWS
- Mostly (a) but occasionally (b)
- Mostly (b) but occasionally (a)
- About equal amounts of (a) and (b)
- Other (please specify)

Waste Stream Management: Shipboard Experience

*** 25. Which best describes your bilges:**

- We have specific programs that are Owner supported that reduce bilge water production to an absolute minimum (we have "dry" bilges)
- We do not have specific Owner supported programs, but we do maintain a dry bilge system
- We attempt to repair all leaks as quickly as possible, but do not always receive shore side support with regard to leak remediation and spare part supply
- I operate a new vessel that inherently does not have many leaks
- I operate an aging vessel and try to minimize leaks but produce significant amounts of bilge liquids
- We do not manage our leaks and deal with bilge water as it occurs
- Other (please specify)

26. Which is your most problematic bilge water inflow type?

27. What (if any) special measures do you take to prevent certain waste products or drains from entering the bilge waste stream?

Waste Stream Management: Shipboard Experience

*** 28. How do you feel about automatic soundings in the engine room MARPOL (IOPP) tanks?**

- I dislike automatic soundings
- I like automatic soundings
- I would like automatic soundings if they were accurate and reliable but in my experience they have been problematic
- I am neutral about automatic soundings
- Not sure

*** 29. In your experience what is more reliable at sea, day in and day out?**

- Manual tank sounding
- Automatic tank sounding device
- About the same
- I have never used automatic soundings

Waste Stream Management: Shipboard Experience

*** 30. What is your experience with water evaporation in incinerator tanks?**

- Never notice losing any
- Lose less than 10% from the tank
- Lose more than 10% from the tank
- No experience
- Other (please specify)

Waste Stream Management: Shipboard Experience

*** 31. Select statements you agree with regarding Oil Record Books:**

- Oil Record Books do not require too much time to fill out
- Oil Record Books require too much time to fill out
- Oil Record Books generally match vessel soundings
- It is difficult get an Oil Record Book to match vessel soundings
- Oil Record Books are redundant because vessels keep other documentation that includes everything recorded in the ORB
- I would prefer an electronic Oil Record Book with more automation
- Entries in the Oil Record Book are used against vessels during Port State Control inspections
- Entries in the Oil Record Book are helpful during Port State Control inspections
- Other

Waste Stream Management: Shipboard Experience

*** 32. What issues do you encounter with Port State Control inspections? (check all that apply)**

- Lack of trust
- Language barriers
- Lack of understanding of OWS operation
- Conflicting instructions regarding OWS operation
- Other (please specify)

Waste Stream Management: Shipboard Experience

*** 33. Rate the paperwork burden on ship's crews for machinery space waste streams:**

- Low
- Manageable
- High
- Very unmanageable

34. Do you have any suggestions to reduce paperwork?

Waste Stream Management: Shipboard Experience

*** 35. Select all types of training that you have received in MARPOL Annex I (bilge water and oily residues (sludge)) waste stream management**

- Instructional seminar
- Video training
- Pamphlets
- Formal training from vessel owner or vessel officers (designated person)
- Informal training from crewmates
- Academy / maritime school training
- None

Other (please specify)

*** 36. Select which types of training you found to be effective:**

- Instructional seminar
- Video training
- Pamphlets
- Formal training from vessel owner or vessel officers (designated person)
- Informal training from crewmates
- Academy / maritime school training
- None
- N/A

Other (please specify)

Oily Water Separators

*** 37. Do you know what an Oily Water Separator is?**

- Yes
- No

Oily Water Separators

*** 38. Rate OWS effectiveness 0 through 10:**

- 0 (never works)
- 1
- 2
- 3
- 4
- 5 (barely adequate)
- 6
- 7
- 8
- 9
- 10 (great equipment)

*** 39. Which best describes your OWS operational experience:**

- None
- Some, but never as a crew member
- Experience with one or two OWS systems as a crew member
- I have personally operated various OWS makes on various different ships as a crew member

Oily Water Separators: Shipboard Experience

The set of questions that follows includes distinctions between OWS equipment that is compliant with Resolution MEPC 60(33) vs equipment compliant with Resolution 107(49). If you are not familiar with the differences between 60(33) and 107(49) OWS equipment, please use the description below to guide your answers:

Resolution MEPC 60(33) OWS equipment is 15 ppm equipment with an Oil Content Meter (OCM) that may be able to be turned to freshwater flush mode while the OWS is operating. 60(33) equipment is not designed to effectively deal with emulsions.

OWS equipment compliant with Resolution MEPC 107(49), effective July 1993, is newer equipment that is fitted with an OCM that stores operational data, and where the freshwater flush valve cannot be engaged while the OCM is operating. 107(49) OWS equipment is specifically designed to deal with emulsions.

You can confirm whether your OWS equipment is 60(33) or 107(49) by checking your IOPP.

Oily Water Separators: Shipboard Experience

*** 40. How many years have you operated 107(49) OWS equipment?**

- I have never operated a 107(49) OWS
- <1 year
- 1-5 years
- >5 years

Oily Water Separators: Shipboard Experience

*** 41. Rate 107(49) OWS effectiveness 0 through 10**

- 0 (never works)
- 1
- 2
- 3
- 4
- 5 (barely adequate)
- 6
- 7
- 8
- 9
- 10 (great equipment - completely reliable to process 15 ppm effluent, and simply a matter of "start" and "stop")
- Don't know

*** 42. Do you think that pre- or post- OWS treatment is necessary to ensure <15 ppm effluent for 107(49) OWS equipment?**

- Yes
- No
- Not sure

Comment (optional)

Oily Water Separators: Shipboard Experience

*** 43. How many years have you operated 60(33) OWS equipment?**

- I have never operated a 60(33) OWS
- <1 year
- 1-5 years
- >5

Oily Water Separators: Shipboard Experience

*** 44. Rate 60(33) OWS effectiveness 0 through 10**

- 0 (never works)
- 1
- 2
- 3
- 4
- 5 (barely adequate)
- 6
- 7
- 8
- 9
- 10 (great equipment - completely reliable to process 15 ppm effluent, and simply a matter of "start" and "stop")
- Don't know

Oily Water Separators: Shipboard Experience

45. What are the common issues you experience (or have heard of) when operating an OWS?

*** 46. Does soot affect the operation of the OWS?**

- Yes
- No
- Not Sure

*** 47. Can bacteria within the oil bilge tank and OWS affect the operation of an OWS?**

- Yes
- No
- Not Sure

*** 48. Does the OWS need to be cleaned more often than the manual suggests?**

- Yes
- No
- Not sure

Oily Water Separators: Shipboard Experience

*** 49. Have you received formal training in OWS equipment operations?**

- Yes
- No

Oily Water Separators: Shipboard Experience

*** 50. How effective was your training in OWS equipment operations?**

- Not effective
- Somewhat effective
- Very effective

Comments (optional)

*** 51. Have you received formal training on the OWS model that you are presently responsible for?**

- Yes
- No

Oily Water Separators: Shipboard Experience

52. What is your favorite OWS manufacturer/model?

53. What is your favorite OCM manufacturer/model?

54. What suggestions do you have to improve OWS technology?

55. What suggestions do you have to improve OWS operations?

Solutions

The following potential solutions have been gathered from various industry documents collected in the online MAX1 [Library](#), and are not necessarily reflective of what the survey builders believe will work. If you agree or disagree with certain options very strongly, please provide your reasoning in the comments section.

*** 56. To improve shipboard waste stream management, rate each approach in terms of effectiveness:**

	Counter-productive	Not effective	Somewhat effective	Extremely effective	Not sure
Run "dry" bilges where possible and minimize OWS operations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Automate waste stream management records through a shipboard plan maintenance system that automatically date stamps entries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Automate ORB entries (with automatic date stamped entries)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Require shoreside disposal only (eliminate OWS technology from ships)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Develop methodology that holds equipment suppliers more directly responsible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improve OWS technologies such that OWS operation becomes less labor intensive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Develop technology that automatically broadcasts OWS operation the way AIS functions today	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Counter-productive	Not effective	Somewhat effective	Extremely effective	Not sure
De-couple owner/manager responsibilities from crew responsibilities (in other words, a crew member cannot be penalized by the Owner for publicly stating that a shipboard waste stream management system is inoperative)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improve academy / maritime school training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improve on-board training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased use of systems for logging OWS malfunctions, problems or uncertainties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Develop a concise and ship's crew focused guidance document describing the obligations under MARPOL on a shipboard level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Institute a regulatory requirement for full-time environmental officers aboard all commercial vessels (to deal with proper recording and execution of the ship's environmental equipment and requirements)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Require that waste stream management system operational maintenance is shore-based only (operation remains ship-based, but when it malfunctions, operation stops and a notification is provided)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Require that OWS maintenance/certification is shore-based only	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide (modest) rewards for crew members reporting operational waste stream management problems (with official reports supplied)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Require more security seals (i.e. tags)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Perform formal human factors studies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduce the number of OWS manufacturers to about the same number of large engine manufacturers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make shipboard waste stream management records (e.g. OWS and ORB records) public online for each ship so that any inspector can review records for any ship at any time and assist crews with correcting potential problems before they occur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Require shipboard testing of OWS systems before acceptance by IMO and/or USCG (in order to test real world ability to reliably produce effluent <15 ppm)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments (optional)

Solutions

*** 57. What other suggestions do you have to improve shipboard waste stream management?**

58. Do you have any additional comments (e.g. problems you have experienced with MARPOL Annex I waste stream management, or other relevant experiences)?

Thank you!

Thank you for participating! To receive information on the outcomes of the survey after results are tabulated, sign up for email updates here: www.max1studies.org

You may also use the website to contribute to waste stream management discussions in the [MAX1 Forum](#), contribute papers to the [MAX1 Library](#), and sign up for the [MAX1 Conference](#) to be held in June 2015.

Please send this survey on to others that may have valuable input by sending them this link: www.surveymonkey.com/s/max1survey