



# Digital Ship Conference

## PERCEPTIONS OF SHIP TECHNOLOGY BY CREWS

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## **FLAGSHIP Project**

➤ **Overall objective: improve the safety, environmental friendliness and competitiveness of European maritime transport.**

➤ **Emphasis on**

- **on-board systems and procedures,**
- **shipmanagement systems on shore,**
- **impact of new technology on organisations, on the ship, of the owner, of the operator**
- **effective and efficient communication interfaces**
- **impact of standards and regulations.**



**FLAGSHIP is a complex project and has 49 partners, including 16 shipowners and shipowners associations, marine equipment manufacturers, classification societies, ship yards, research institutes and universities.**

- Time period 4 years, starting January 2007**
- Overall budget some € 20 million, half co-financed by the European Commission**
- Much attention for demonstration and training**
- We want real practical tangible results**



- All sorts of technology are increasingly dominating the operation of ships,
- Limitation in available skilled crew
- Infrastructures for closer integration ship and shore-based resources
- All sorts and forms of technology and ICT are taking ever increasing importance,
- **Need for a survey on the perception of ship technology.**

# Questionnaire Perception of Ship Technologies

**Total 70 questions on the prime areas:**

- **General resistance to new technology**
- **Specific reasons for resisting new technology**
- **Opinion concerning specific pieces of technology**
- **Computer literacy E-mail and Internet access**
- **General thoughts on ship technology (open question)**
- **Work situation & Demographics (age,nationality)**

# PROCEDURE

- **Respond online, or in word format in 5 languages (15 min. work)**
- **Distribution by participants to European shipowners**
- **In total 2,681 questionnaires were returned, almost 90% on paper / word**

**[www.technologyatsea.com](http://www.technologyatsea.com)**

# Nationality of sample

| Nationality | n   | %    |
|-------------|-----|------|
| British     | 795 | 34.1 |
| Filipino    | 630 | 27.1 |
| Dutch       | 173 | 7.4  |
| Indian      | 140 | 6.0  |
| Italian     | 111 | 4.8  |
| Norwegian   | 101 | 4.3  |
| Polish      | 84  | 3.6  |
| Russian     | 39  | 1.7  |
| Other       | 255 | 11.0 |

| Ship Type        | %    | Ship Type        | %    |
|------------------|------|------------------|------|
| Passenger Ferry  | 4.3  | General Cargo    | 12.2 |
| High-Speed Ferry | 0.7  | Reefer           | 0.2  |
| Freight Ro-Ro    | 5.4  | Offshore Support | 3.3  |
| Products Tanker  | 3.9  | Supply Vessel    | 2.7  |
| Shuttle Tanker   | 0.8  | Standby Vessel   | 1.2  |
| Crude Tanker     | 3.0  | Dredger          | 1.2  |
| Chemical Tanker  | 5.3  | Container Ship   | 6.9  |
| Gas Tanker       | 9.3  | Tug              | 0.7  |
| Car Carrier      | 6.7  | Tanker (Other)   | 2.2  |
| Cruise Ship      | 9.7  | Other            | 9.5  |
| Bulker           | 10.7 |                  |      |

# **Level of technology installed on their present / most recent vessel,**

- **34.4% considered vessel 'High Tech'**
- **55.8% considered vessel 'Average'**
- **9.8% considered vessel 'Low Tech'.**
- **Majority of vessels 74.4% were certified as UMS (unmanned machinery space).**

# To what extent do you generally feel resistant, for whatever reason, to the introduction of new technology onboard ship?

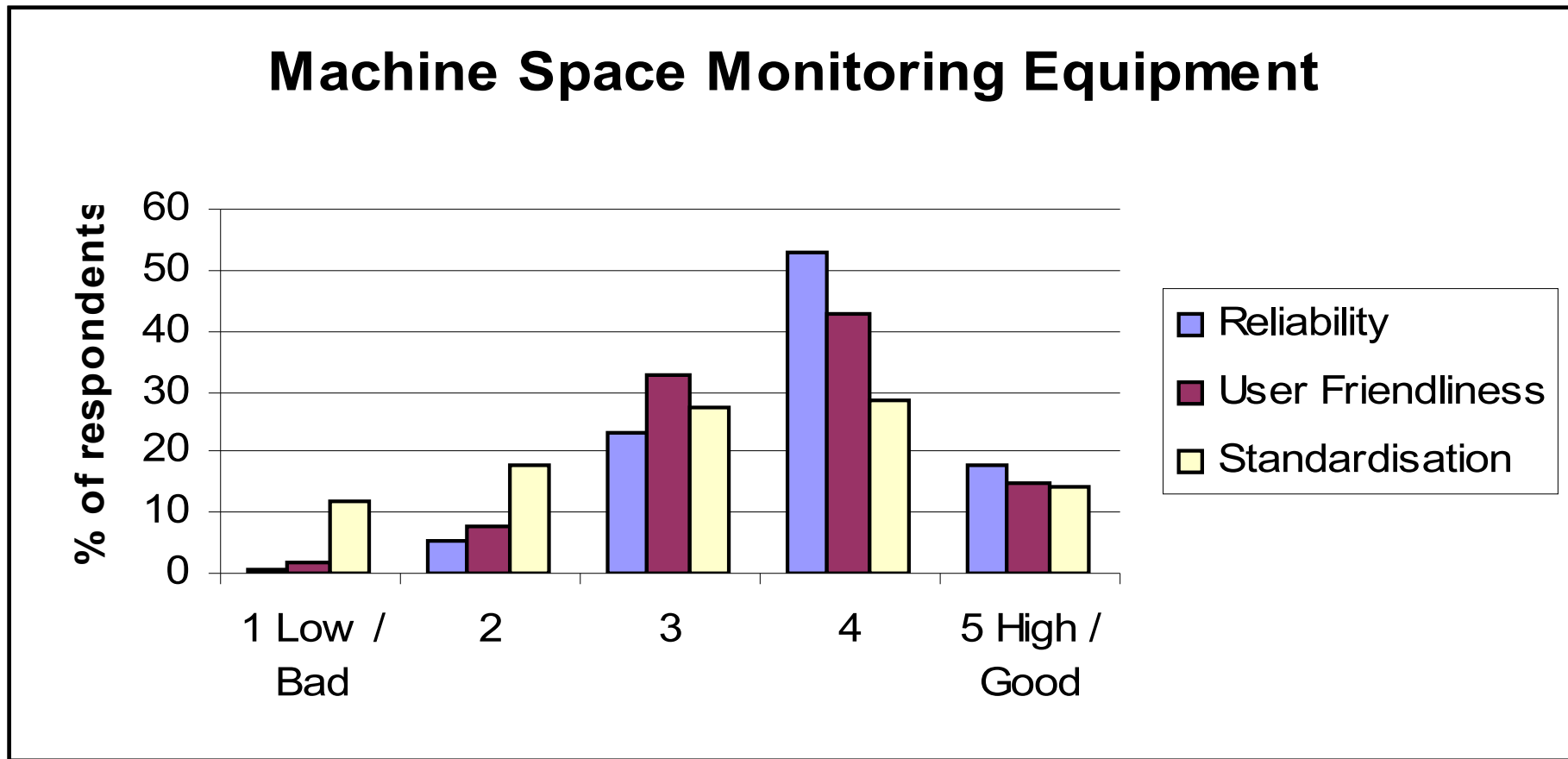
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|                     |              |
|---------------------|--------------|
| <b>Not at all</b>   | <b>30.6%</b> |
| <b>A little</b>     | <b>26.9%</b> |
| <b>Moderately</b>   | <b>27.5%</b> |
| <b>Quite a lot</b>  | <b>10.3%</b> |
| <b>A great deal</b> | <b>4.7%</b>  |

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**Seafarers are largely satisfied with the reliability, user friendliness and standardisation of the specific pieces of equipment examined, notably Radar/ARPA, Machine Space Monitoring Equipment, AIS, ECDIS, GPS.**



Only included answers by respondents effectively using equipment

# Some questions:

- **Technology is putting seafarers out of work**
- **Technology tends to be introduced without sufficient training**
- **The introduction of new technology undervalues the skills of the seafarer**
- **Technology is often too unreliable to be of practical use**
- **Cadets and new seafarers rely on technology too much**

# Response

- **Insufficient training: > 50% quite a lot or a great deal**
- **Cadets rely on technology too much: > 50% quite a lot or a great deal**

- **Few respondents considered technology to be of little or no help in terms of security, efficiency and health and safety.**
- **Seafarers clearly recognise the benefits of technology but want to see sufficient training to feel supported in its use.**

**If you were given money to increase the usefulness of technology onboard ship where would you consider the best place to spend it?**

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|                                                                         |              |
|-------------------------------------------------------------------------|--------------|
| <b>Introduction of new technology and the most up to date equipment</b> | <b>15.7%</b> |
|-------------------------------------------------------------------------|--------------|

|                                                                |              |
|----------------------------------------------------------------|--------------|
| <b>Increased integration of different pieces of technology</b> | <b>16.6%</b> |
|----------------------------------------------------------------|--------------|

|                                                                       |              |
|-----------------------------------------------------------------------|--------------|
| <b>Better training of crew in terms of how to use ship technology</b> | <b>64.4%</b> |
|-----------------------------------------------------------------------|--------------|

|              |             |
|--------------|-------------|
| <b>Other</b> | <b>3.3%</b> |
|--------------|-------------|

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# Would you generally like to see more or less technology onboard the ships you work with?

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|                               |              |
|-------------------------------|--------------|
| <b>Would like to see less</b> | <b>4.5%</b>  |
| <b>About right</b>            | <b>40.9%</b> |
| <b>Would like to see more</b> | <b>54.6%</b> |

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# *Training*

**From the open question on Ship Technology around half of the responses referred to training. This issue was consistently mentioned by all subjects from different parts of the world.**

# *Training*

- **A number of points within this issue of training were raised:**
  - **Many felt that this lack of training is due to companies trying to cut costs,**
  - **Spending money on new technology which is not used efficiently is not cost-effective.**
  - **Seafarers are often expected to learn how to use new technology through a process of 'trial and error'. Many pointed out the safety risk this poses.**
  - **If any training in new technology is given it is often unsatisfactory e.g. a DVD.**

# *Training*

- **In-depth training courses, provided by the manufacturer and specific to the equipment onboard**
- **Have ‘refresher’ courses for seafarers in the efficient use of existing technology onboard**
- **The issue of standardisation is relevant here, as seafarers being trained in the use of a specific piece of equipment may not be useful for the same piece of equipment with a different manufacturer.**
- **Older seafarers needing training for even relatively established/ standard ship technology, which was introduced after they were first trained as seafarers**
- **Older respondents often commented on young seafarer’s lack of training in traditional seafaring skills resulting in an over-reliance on technology.**

## ***E-MAIL & INTERNET***

- **Email was given an extremely high value by the majority. Subjects tended to feel very strongly about this.**
- **Many subjects did already have access to some form of email and expressed how much they appreciated this service.**
- **Those that did not have this service felt that this was not acceptable and were waiting for their company to arrange installation.**
- **Internet was given a high value by a large proportion of subjects, though was commented on less frequently than email access and was often described as a very welcome 'luxury' rather than a 'necessity'.**

## ***E-MAIL & INTERNET***

- **Often the email service available is in a public area and a shared account for all crew members. Mail could be read by any member of staff.**
- **Use of internet could unduly distract and also become very expensive on broadband.**

## ***E-MAIL & INTERNET***

### ***Suggested solutions for concerns raised:***

- **There should be separate computer stations for work use and personal use.**
- **Computers in work areas, e.g. Bridge/Engine room, should not have access to internet/email to prevent distraction when on duty.**
- **Crew members could be given an allowance of a fixed number of minutes they could spend using these services a week.**
- **Computer protection software should be installed to protect against infection of computers with viruses**

# Quotes from the open question

## ***Training and nautical experience***

- *“Technology is good when the operator has training but at present there are less and less trained people in this industry”*
- *“Many of the British Shipping Companies I have worked for would only install new technology when required to do so by legislation. The ship’s staff was left to get on with it without training”*

# Quotes from the open question

## ***Training and nautical experience***

- *“Advancements’ in technology are inevitable. I am concerned about how technology increasingly leaves inexperienced people alone with systems/plant, increasing stress levels and pressure on them. Technology does not eliminate the possibility of error; it just creates new ways for this to happen. I dislike the way in which technology and centralisation of management ashore is degrading the skills of the seafarer”*

# Quotes from the open question

## ***Technology is good?***

*“Technology as a controlling, assisting or monitoring tool is good. Technology just because it is possible more often than not creates more work than it is time and work saving. Everything breaks down eventually and needs to be repaired, (which) is often time consuming and at a high cost”*

# Quotes from the open question

## ***Standards and design***

*“As a Master Mariner... I feel very strongly about the design of modern equipment with particular reference to both control panels and visual display units. In my experience a lot of equipment could be more user-friendly. With new equipment, panic can set in leading to ‘blindness’ with the display unit. This is not just a training issue but bad design and a lack of research from a psychological perspective’*

# MAIN MESSAGES

**In general only 15% reported feeling resistant to new technology either 'quite a lot' or 'a great deal' with the majority of opinion leaning towards only moderate or low resistance.**

**So, seafarers are largely positive towards new technology and specific pieces of equipment they use regularly.**

# MAIN MESSAGES

**Training was clearly the biggest area of resistance to new technology.**

**Seafarers support new technology, but only when they are properly supported in its use.**

# MAIN MESSAGES

**Resistance to new technology is not universal. Age, computer literacy, nationality, rank and department were all found to affect levels of resistance to new technology.**

# MAIN MESSAGES

**The importance of e-mail access for seafarers should not be underestimated.**

**E-mail privacy is also a key concern.**



**THANK YOU FOR YOUR  
ATTENTION**

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