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NAVIGATION
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Agenda item 11

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DEVELOPMENT OF AN E-NAVIGATION STRATEGY IMPLEMENTATION PLAN

Results of a worldwide e-navigation user needs survey

Submitted by Germany

SUMMARY

<i>Executive summary:</i>	This paper summarizes the results of a worldwide survey conducted by Germany to determine detailed e-navigation user needs. The questionnaire used for the survey was developed based on the high-level user needs specified in NAV 54/25. The survey focused primarily on onboard user needs.
<i>Strategic Direction:</i>	5.2
<i>High-level action:</i>	5.2.4
<i>Planned output:</i>	5.2.4.4
<i>Action to be taken:</i>	Paragraphs 22 and 23
<i>Related documents:</i>	MSC 81/23/10; MSC.252(83); NAV 55/INF.9; NAV 54/4, NAV 54/13, NAV 54/13/1, NAV 54/25; NAV 53/22, NAV 53/13, NAV 53/13/1, NAV 53/13/2, NAV 53/13/3 and COMSAR 12/11

Introduction

1 NAV 54 finalized the concept for the e-navigation strategy. It includes a draft framework for the implementation process of the e-navigation strategy with a time frame for implementation. According to NAV 54/25 detailed e-navigation user needs should be specified by 2009.

2 This document summarizes the results of a worldwide survey organized and conducted by Germany to determine detailed e-navigation user needs. The questionnaire used for the survey was jointly developed by Canada and Germany and is based on the high-level user needs specified in NAV 54/25 and NAV 54/13. The survey focuses primarily on onboard user needs. The questionnaire is structured into three main sections: Maritime Communications, Human Machine Interface and Technical/Operational Enhancements. Due to the limited capacity of the questionnaire, some issues that were dealt by IMO in the framework of other tasks (e.g., bridge alert management) were not investigated.

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3 The questionnaire could be completed in three different ways:

- web-based;
- in portable document format (PDF) to be completed at the computer; and
- in printed format.

The questionnaire was distributed world-wide to potential e-navigation users via e-mail with support of Member States, the Nautical Institute, the International Shipowners Association, the International Maritime Pilots' Association, the International Chamber of Shipping, the Canadian Coast Guard, and others.

4 In addition to this survey other Member States plan to conduct e-navigation user needs surveys using the jointly developed questionnaire. From May to September 2009, Canada will be conducting a survey whereby both shore-based and shipborne personnel will be interviewed throughout Canada. Since these interviews will be based on the jointly-developed questionnaire, the results will provide an additional assessment of e-navigation user requirements. In the United States, the United States Coast Guard will pursue various avenues to ascertain e-navigation user needs of the many and diverse maritime operations, including Harbour Safety Committees, Maritime Pilot Associations, Marine Exchanges, Port Authorities, inland/shallow-draft vessels, and maritime academies.

Participants

5 In total 353 persons participated in the e-navigation user needs survey. The average experience of the participants as mariner is 16.6 years. The participants belong to various nationalities from all over the world. The largest group is from India (22%), followed by Canadians (18%), Germans (10%) and British (6%). Further nationalities of participants were Australian, Filipino and Finnish (5% each) as well as 29 other nations.

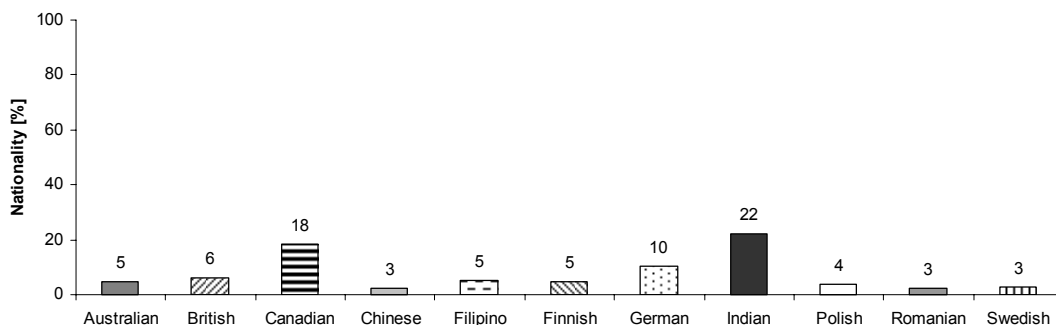


Figure 1: Participation by Nationality [%] >2%, (N=353)

6 The majority of the participants is currently working on board (88%), most of them on tankers (25%), bulk carriers (22%), container vessels (12%) and cruise ships (11%). According to their current position 1st officers (27%) and masters (25%) form the largest group, followed by 2nd (18%) and 3rd/4th officers (11%). Six per cent of the participants working on board are maritime pilots. Participants working ashore include: operations manager, marine superintendents, simulator instructors and shipowners.

Maritime communications

7 Most participants do not see major problems in maritime communications. The greatest concerns in the communication between ships involve language skills (18% high degree, 44% moderate degree), and the missing use of standard communication phrases (13% high degree, 33% moderate degree). Problems in the communication between ship and shore/shore and ship are most often related to a high volume of traffic communication (12% high degree, 39% moderate degree).

8 85% of the participants are in favour of using broadband for the provision and exchange of marine communications. They especially support the use of satellite broadband for the communication between ship and shore/shore and ship (68% in favour) as well as between ships (52% in favour).

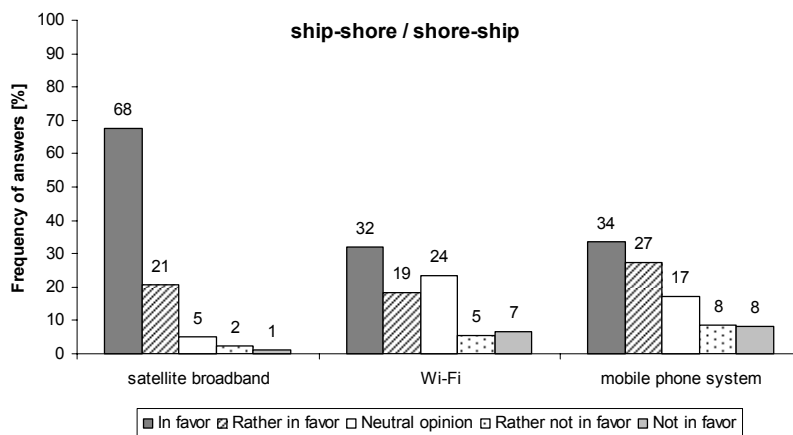


Figure 2: Preferences [%] on type of broadband for ship-shore/shore-ship communication (N=296-303)

9 Overall few participants see major problems in the communication between shore authorities. Seventeen per cent feel that the use of different data formats is a high degree problem (28% moderate degree). Another deficiency rated high by 16% of the participants is the unwillingness of different parties to share certain types of information (34% moderate degree).

10 Participants working on board comment that current reporting procedures are distracting them from their navigational duties, and increase their workload especially in confined waters where there is heavy traffic. They highlight that they need to send the same information several times to different parties ashore, and in different required reporting formats. The vast majority of the participants is in favour of a concept (74% in favour, 17% rather in favour): that vessels send the required reporting information only once and all required shore-based operations (e.g., VTS, harbours, agents) have access to this information, so that only adjustments to the specific situations need to be communicated via voice.

There seems to be a compelling need to standardize reporting procedures and forms globally to avoid repetition of reporting and reduce workload.

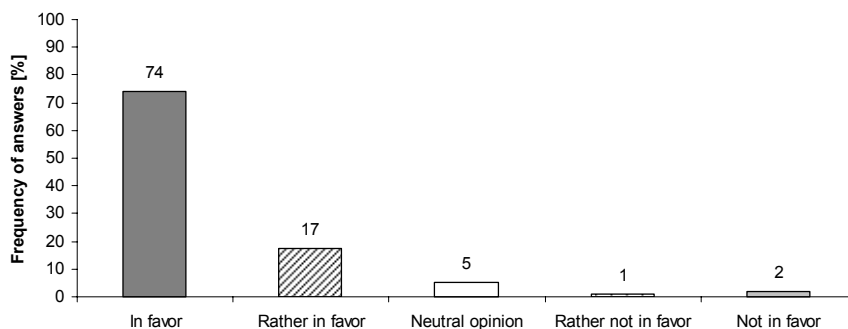


Figure 3: Opinions [%] on concept to send required reporting information only once (N=352)

11 About half of the participants have high (14%) or moderate (41%) knowledge or experience with AIS binary messages, while the remaining have low (27%) or no (17%) experience or knowledge with it. Overall, there are mixed opinions whether AIS binary messages are an effective means to transmit navigation-related information (21% yes/agree, 23% rather agree, 14% rather disagree, 14% no/disagree). According to experience the percentage of agreement (yes/agree) varied. While 29% of those experienced with AIS binary messages feel it is an effective means to transmit navigation-related information, only 11% of those with limited experience think so. Eighteen per cent of the participants with limited experience have no opinion on the topic.

Both experienced and inexperienced participants raised concerns regarding the use of AIS binary messages for the transmission of navigation-related information. Main concerns are that no feedback is provided on whether the message was received (39% high degree, 36% moderate) and understood (41% high degree, 31% moderate). Other concerns included: vessels without AIS (40% high degree, 28% moderate) and that AIS binary messages may be too slow for time-critical information (40% high degree, 29% moderate).

Human Machine Interface

12 213 participants answered the open-ended question: “From your point of view, what should be improved regarding the Human Machine Interface (presentation of information and operation of the systems) at your workplace?”. The main topics raised were user friendliness, standardization, integration, ergonomic issues, alarm management, reliability, and training.

About a quarter of the participants that answered the question addressed usability issues (e.g., that the operation of systems needs to be more user-friendly, and that the presentation of information should be kept simple). Approximately one fifth of those who answered emphasised that equipment operation and presentation of information should be standardized for all manufacturers.

13 In general, there is support for the presentation of user-selectable information received via communication equipment on the navigational displays on the ships bridge. Figure 4 shows the 10 types of information (out of 23 suggested) which received the highest support for presentation.

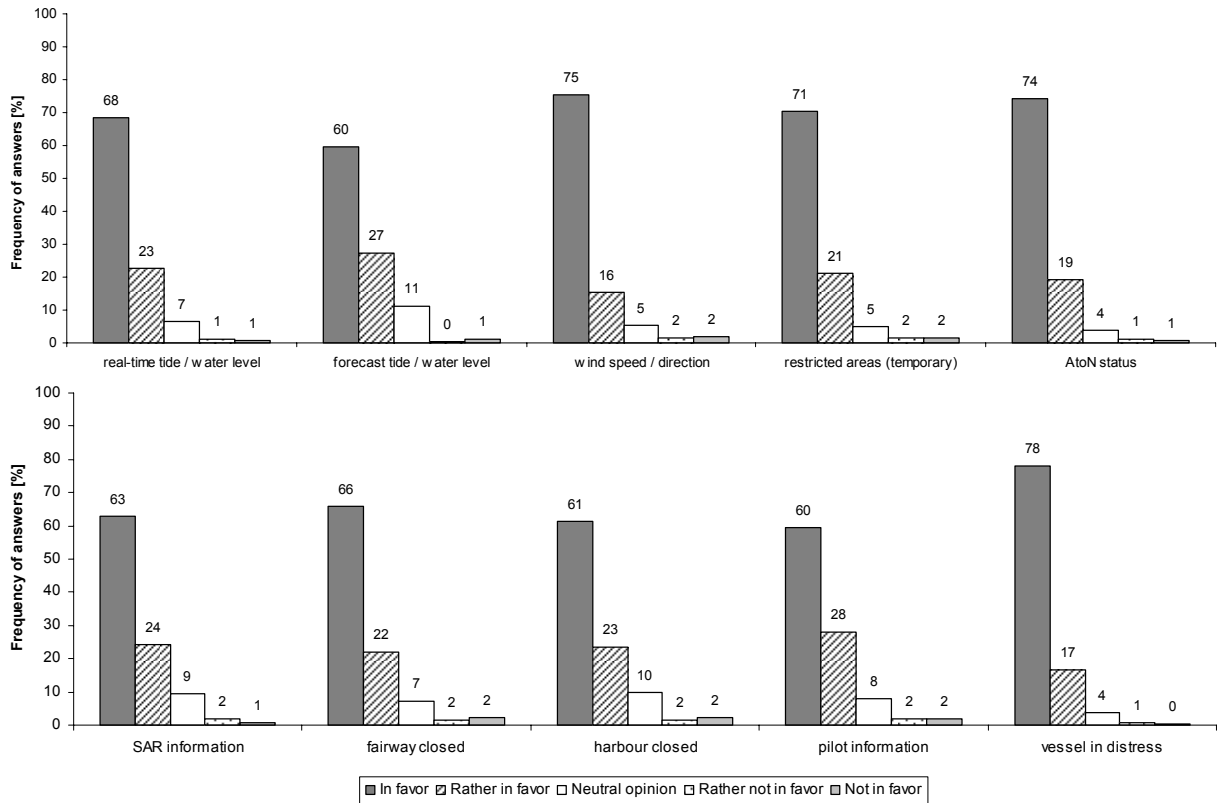


Figure 4: Preferences [%] for presentation of further information on navigational displays on the ship's bridge (N=320-329)

14 Participants feel that during certain circumstances there should be a possibility to filter some transmitted data according to user-set parameters. As an example, 54% are in favour to set filters so that only information from user-selected sea areas is displayed (24% rather in favour).

15 Most participants are in favour of the S-Mode concept (50% in favour, 30% rather in favour), while 2% are not in favour (3% rather not in favour).

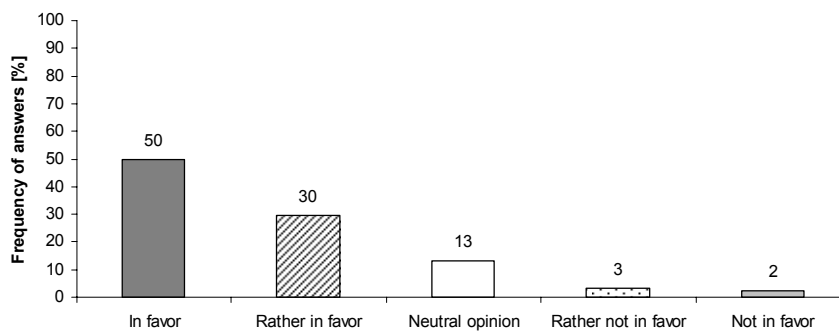


Figure 5: Opinions [%] on S-Mode concept (N=327)

Technical/Operational Enhancements

16 Most participants indicated a preference for another GNSS as a redundancy for a GNSS (68% in favour, 17% rather in favour). There is also support for the use of radar positioning (42% in favour, 23% rather in favour). Only 8% are in favour of Loran C as a redundancy for a GNSS, 40% are not in favour, 16% rather not in favour.

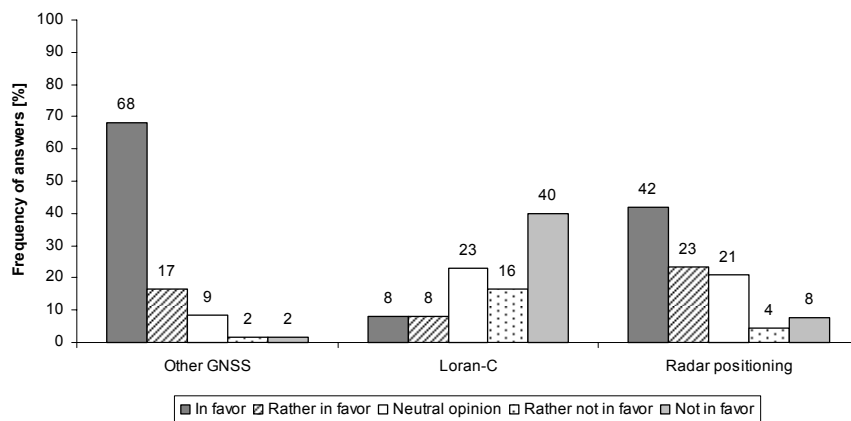


Figure 6: Preferences [%] for redundancy for a GNSS (N=324-341)

17 Most participants are in favour of having a more overall strategic coordination of the traffic flow from a shore-side, e.g., regarding very large or special vessel movements (58% in favour, 31% rather in favour), and according to the traffic density (53% in favour, 35% rather in favour).

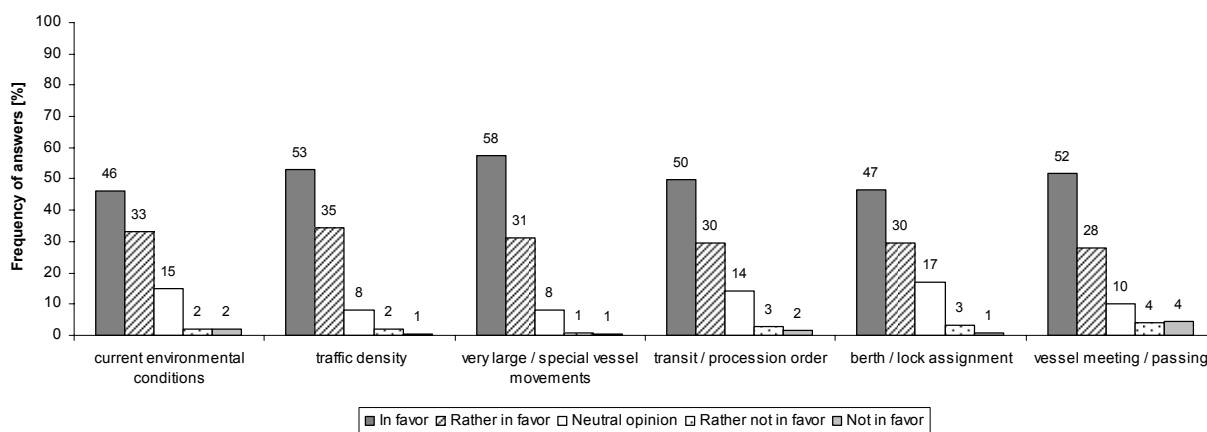


Figure 7: Preferences [%] for a more overall strategic coordination of the traffic flow from shore-side according to parameters (N=349-351)

18 There is a tendency of support for having automatic checks for certain required shipboard routines (43% in favour, 28% rather in favour), while 7% are not in favour, and 8% rather not in favour.

19 The idea of having paper information and documentation provided in electronic form is supported by most of the participants (52% in favour, 31% rather in favour).

20 In document NAV 55/INF.9 the results are described in further detail.

Recommendation for further introduction of user needs in the e-navigation strategy

21 Due to the fact that user needs are of paramount importance and the driving force for the e-navigation concept, it is recommended to introduce an ongoing procedure to verify and update user requirements as deem necessary during the implementation process for the e-navigation strategy. It is of high importance to introduce new knowledge gained through the use of new

equipment (e.g., radar complying to MSC.192(79)), the carriage requirements of ECDIS and the possibilities which are offered with the introduction of the task oriented approach of the revised performance standards for INS (MSC.252(83)).

Action requested of the Sub-Committee

22 The Sub-Committee is invited to note the information provided, and make use of it in their deliberations on e-navigation as deemed appropriate.

23 The Sub-Committee is also invited to note especially the information and suggestions provided in paragraphs 10 and 21, and make use of it in their deliberations on e-navigation as deemed appropriate.
