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GUIDELINES ON THE APPLICATION OF SOLAS REGULATION V/15 TO INS, IBS AND BRIDGE DESIGN

1 The Maritime Safety Committee (MSC), at its eighty-third session (3 to 12 October 2007), recognizing the importance of Guidelines on the application of SOLAS regulation V/15 to INS, IBS and bridge design, to be taken into account by designers and system integrators, approved the Guidelines on the application of SOLAS regulation V/15 to INS, IBS and bridge design prepared by the Sub-Committee on Safety of Navigation (NAV), at its fifty-third session, as set out in the annex.

2 Member Governments are invited to bring the annexed guidelines to the attention of designers, manufactures and all other parties concerned.

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ANNEX

GUIDELINES ON THE APPLICATION OF SOLAS REGULATION V/15 TO INS, IBS AND BRIDGE DESIGN

1 Purpose

SOLAS regulation V/15 requires that the design and arrangement of navigation systems and equipment on the bridge facilitate the tasks to be performed by the bridge team and the pilot and promote safe and effective Bridge Resource Management (BRM). The purpose of this document is to identify the needs of the bridge team and the pilot and the BRM principles that should be taken into account in the design and arrangement of INS, IBS and for bridge design for the installation of INS and IBS on the bridge.

2 Application

2.1 These guidelines should be taken into account by designers and system integrators designing and installing INS and IBS systems on board, for bridge design and installation of navigation equipment. The guidelines should also be taken into account in the development of performance standards.

3 Definitions

System Unless otherwise noted or clear from the context of the statement, the term "system" used in this document means either an INS and/or an IBS.

4 General

4.1 The system should facilitate the tasks to be performed by the bridge team and pilot in navigating the ship safely under all operational conditions. The physical arrangement of the systems on the bridge and presentation of information should permit observation or monitoring by all members of the bridge team and pilot.

4.2 The system should avoid the potential for a single-person failure during operation and should minimize the risk of human error by facilitating monitoring and cross checks between members of the bridge team and pilot and to conduct supervision of operator interaction with the system.

4.3 The system and its physical arrangement should facilitate the bridge team and pilot in maintaining a full appraisal of the situation by both observing information provided by the system and validating that information by actual observation of the surrounding environment.

4.4 The system and its physical arrangement should promote safe and effective exchange of information amongst the members of the bridge team and with pilots.

4.5 The system and its physical arrangements should comply with appropriate ergonomic standards, e.g., Guidelines on Ergonomic Criteria for Bridge Equipment and Layout, MSC/Circ.982.

5 Support to tasks

5.1 The system should have the capability of allowing the operator to decline or override the automated ship control functions at any time or intervene part way through a process by means of a simple operator action.

5.2 Recognizing that the bridge team and pilot are required to use 'any means available' to safely navigate the ship including visual position fixing and lookout as well as communications with external sources of information such as other traffic and VTS stations, the design of the system should therefore support the use of all means and their correlation.

5.3 The system and its physical arrangement should enable the bridge team and pilot to conn (i.e., direct the movement of) the ship by verbal instructions from any position on the bridge while still having access to heading, rudder or azipod angle, and propeller RPM or pitch and, if available, rate-of-turn information.

5.4 The system should support procedures and actions to address failure modes and default to manual controls on failure of automated ship control functions.

5.5 The system should be designed so that its operation minimizes distraction on the bridge that may interfere with the vigilance of the bridge team and the pilot. The focus should be on handling the ship rather than on operating the system.

5.6 The workload involved in navigation tasks employing the system should be analysed and tested during the design phase. Complex or error-prone interaction with the system should be avoided in its design.

5.7 The system should support the bridge team and the pilot in navigating the ship safely under all operational conditions. All conditions should be considered in design tasks such as failure analysis, task analysis, user interface design, etc. During design, functional and operational testing or analysis should be conducted.

5.8 The system and its physical arrangement should support team working, including the assignment of tasks among the bridge team and pilot.

5.9 All navigation and watch keeping tasks required by the STCW, SOLAS, and COLREGs, as appropriate, should be considered in the system design phase. The usability of the system and its arrangement, when employed for such tasks should be assessed during functional and operational analysis and tests.

6 Human error prevention and detection

6.1 User inputs and commands related to ship control should be displayed so that all members of the bridge team and the pilot are able to monitor and detect single-person errors.

6.2 The system should provide means to rapidly correct erroneous inputs or commands related to ship control. Wherever possible, an "undo" function should be provided.

6.3 The system should provide checks in the human-machine interface dialogue and in the user input handling to prevent erroneous data or control inputs.

7 Traffic awareness

7.1 The system and its physical arrangement should facilitate effective lookout by visual, audible and electronic means under all conditions.

7.2 The system and its physical arrangement should provide means to acquire and maintain timely and accurate situational awareness of current and projected traffic conditions.

8 Operational mode awareness

8.1 The system and its physical arrangement should provide convenient and continuous access to essential information such as heading, rudder or azipod angle, and propeller RPM or pitch and, if available, rate-of-turn for both the bridge team and the pilot to information necessary for the safe navigation. If any auxiliary or separate console or workstation is provided for the pilot, it should provide the same quality and quantity of navigation information needed by the pilot as the main console or workstation.

8.2 The system should continuously indicate to the bridge team and pilot the system operating modes currently in use and provide simple access to other available operating modes.

8.3 The system should indicate failures in a clear and unambiguous manner to enable the bridge team and pilot to understand the nature of the failure.

8.4 Information should be presented consistently within and between different subsystems. Standardized information presentation, symbols, abbreviations and coding should be used according to resolution MSC.191(79).

8.5 Where standardized symbols are not available, information, symbols and coding should be visually representative and should be consistent with established information presentation, symbols and coding. The used symbols should not conflict with the symbols specified in SN/Circ.243. Any inconsistencies that might cause confusion or errors should be avoided.

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