CONCLUSION AND RECOMMENDATIONS

Conclusion

- Navigating with ECDIS is fundamentally different from navigating with paper charts. ECDIS provides a number of additional planning functions and features such as safety contours, alarms, click-and-drop facilities for waypoints and markers. Whilst in many ways ECDIS makes voyage planning easier it is still possible to make errors, however these are likely to be of a different type to those encountered when using paper charts. There is a tendency to put too much trust in computer based systems and believe whatever is on the display. It is essential that officers remember to cross check the information displayed by all other means available, especially by looking out the window and watching the radar.
- Use of sources for producing of ENC has its limitation primarily due to the accuracy it portrayed to meet the increasing challenges on the safety of navigation, particularly in busy shipping routes and hazardous areas. The impact on hydrographic surveying charting and safety of shipping is inter-related from the methods of positioning systems to the sounding techniques to the compilation of charts. It is foreseeable that ENC will be produced right from the source with complete modern surveys and coverage to portray greater accuracy and thus further enhance navigational safety in the future.
- Key safety issue related to the use of electronic charts onboard ships involves different perspectives. For professional mariners, they see advantages in terms of a reduction of the workload required to operate the ship. For the ship owner, it contributes to improving the efficiency of shipboard operations and for compliance with required safety procedures. For the general public, they expect that the use of electronic chart-related technologies will result in fewer maritime incidents. The proper employment of this new navigation system should lead to better working condition for the mariner, and also contribute to enhanced safety and improved economic efficiency.
- On the other hand, the employment of new technologies has limitations and will introduce risks that must be recognized.

Recommendations

General Recommendations

The ECDIS concept is a total change from using paper charts and the transition from paper charts to electronic charts that will pose a challenge for the industry, particularly for those who have no current experience of electronic charts. Mariners should be aware that ECDIS is more than just a digital version of a paper chart. Important bridge procedures are significantly affected, and these require careful analysis and consideration if ECDIS assisted groundings are to be avoided. It is important that traditional navigation skills are not lost and that navigators become not overconfident, in the use of ECDIS.

There is a danger that many bridge watch keepers will increasingly trust what is displayed without question. Bridge watch keepers should remain vigilant and continuously monitor a vessel's position in relation to navigational hazards remains valid, regardless of the electronic aids available.

Having a vessel equipped with ECDIS must not lull the mariner into a false sense of security. As with all electronic equipment, ECDIS is an aid to navigation, albeit a very significant one, but it is not a substitute for the observance of good seamanship, or for maintaining an effective lookout at all times during the voyage. By itself, ECDIS is no replacement for a trained and experienced navigator. The benefits and limitations of electronic navigation must be understood by the navigator to enable ECDIS to be used efficiently and safely. To ensure the safety of navigation, it is important that the shipping community acknowledge that the training and experience of watch keepers are critical factors in mitigating the risk of collisions and groundings

ECDIS requires a different way of thinking for the mariner, and this will not be immediately picked up by attending an ECDIS course lasting only a few days. All of this new technology will be of very little use in enhancing navigational safety if the watch keeping officer is not fully trained and competent in its use.

Recommendations to Ship owners and Operators

- Ensure that the regulatory status of these systems is understood when purchasing systems for onboard use and that the purchasing departments are aware of the differences between official and unofficial chart data for use on the onboard system;
- Address training needs. There is a professional responsibility to provide adequate training which should include the operation of the system itself as well as using the system as a decision support tool for navigating, maneuvering and collision avoidance work;
- Ensure that there are clear procedures in place which take into account system limitations if used during a watch. Without clear procedures, mariners may assume that a non-ECDIS ECS can be used for navigation;
- Ensure that, if the system is an approved ECDIS, that it has a sufficient back up, is approved by the flag state administration and always uses official hydrographic data (even though many ECDIS hardware systems are able to display un-official data) .

Recommendations to Ship Masters

- The Master must be aware of the systems onboard and ensure that watch keepers are familiar with restrictions and procedures for use of ECDIS;
- Ensure that training and familiarization is carried out in accordance with STCW requirements and company procedures;
- Advise companies if the level of training or familiarization is deemed to be inadequate.

Recommendations to Manufacturers

- Make use of ECDIS easier by improving the software, and make it friendly use
- Add new warnings that contribute to the safety of navigation, such as warning the ship enters un-surveyed area, and give the date of the last survey.

Recommendations to Maritime Training Institutions

The main challenge that faces maritime academies is maintaining the skills of traditional navigation, and the addition of new skills required by the use of modern technology and the requirements of the labor market to consolidate the concepts and new skills that must be acquired by the mariner during the stages of study. All the skills of traditional navigation

acquired by the student should be applied to electronic charts, and the division of Chart Work on both types of paper charts and the electronic charts. The student learns the traditional chart work and its applications on an electronic chart to prepare a generation of navigators able to interact with modern technology and labor market requirements.