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SUB-COMMITTEE ON STANDARDS OF
TRAINING AND WATCHKEEPING
38th session
Agenda item 13

STW 38/13/5
17 November 2006
Original: ENGLISH

REVIEW OF THE PRINCIPLES FOR ESTABLISHING THE SAFE MANNING LEVEL OF SHIPS

Manning Trends and Approach to the Review

Submitted by the United States

SUMMARY

<i>Executive summary:</i>	This paper provides an overview of current manning trends in the maritime industry and discusses the need for a systematic approach to establishing safe manning levels of vessels that considers multiple influences, particularly the Human Element
<i>Action to be taken:</i>	Paragraph 13
<i>Related documents:</i>	MSC 81/23/03; MSC 81/23/19; MSC 81/23/21; MSC 81/23/23, and MSC/Circ.1014

Introduction

1 At its eighty-first session, the Maritime Safety Committee agreed there was the need for a high-priority item on “Review of the principles for establishing the safe manning levels of ships” and placed the item on the work-plan for STW 38. The Committee referred the related documents to STW 38 for detailed consideration, with a view to taking into account the information contained therein, along with the guidance on fatigue mitigation and management (MSC/Circ.1014), during its deliberations.

Discussion

2 The primary focus of the related documents is fatigue. The United States strongly agrees that the mitigation and management of fatigue among mariners is a serious safety concern. The United States has recognized the magnitude of the fatigue problem for some time and continues to support the IMO in its efforts to address fatigue.

3 The United States believes that manning levels of ships is a significant factor driving the incidence of fatigue and fatigue-related casualties. Also well understood are the linkages among fatigue, hours of work, workload while on watch, and manning levels. However, there are numerous other issues influencing fatigue, beyond the manning level, to be considered. These

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include work-rest schedules, ships' work obligations beyond watchstanding, automation, crew habitability conditions, quantity and quality of sleep, physical fitness, and diet. Therefore, we believe that the assumption that a review and adjustment in the safe manning levels of ships is all that is necessary is too simplistic, and any attempt to rush to a solution under that assumption will not solve the fatigue problem.

4 In addition, there are many other safety concerns related to the safe manning levels of ships that are not fatigue-related. Numerous studies have shown that fatigue is not the only cause of casualties, but that other causes, including human element-related issues such as bridge team coordination, seafarer training and adequate watch-standing are involved. Therefore, when conducting a review of the principles to establish minimum safe manning levels, a holistic approach is necessary in order to truly address not only fatigue but overall vessel safety.

5 Just as fatigue is multifaceted, so too is the issue of establishing the safe manning levels of ships. There are multiple influences on the determination of the safe manning of a vessel. Figure 1 (annex) shows a conceptual influence diagram of the various factors and parties involved in making the determination of a level of safe manning.

6 As noted in the figure, there are multiple physical features of a vessel, including the type, propulsion, age, and size of the vessel, that influence the level of manning. In addition, operating procedures, policies, and standards, including the cargo operations scenarios, shoreside support, and the vessel's route influence the level of manning. Furthermore, administration policies and regulations as well as IMO and ILO instruments affect the level of manning.

7 Recent studies on crewing practices indicate that existing crew sizes can be correlated to certain vessel factors (age, size, type, etc.) that may serve as predictors for the size of the crew. The United States' Maritime Administration (MARAD) published a report¹ on foreign crew practices for vessels calling in the United States. This report is based on the annual arrivals at a sample of United States ports. Over 10,000 crew lists from more than 3,700 different vessels were included in the study. The focus of this study was cargo vessels (dry cargo, tanker, container, and RO-RO/car carriers). Among their findings, they note that vessel size, age, and type are important variables affecting crew size, and that vessel age is a more important determinant of crew size than vessel size. They report that newer and smaller vessels had lower crew complements, and that tankers had a higher average crew complement across all age groups than other vessel types. The report indicates that average crew sizes range from a low of 13 for newer, smaller bulk carriers to a high of 28 for the oldest, largest tankers.

8 The Seafarers International Research Centre (SIRC) in the United Kingdom recently released an analysis of crewing levels and the effects of vessel size and flag on crew composition, which found similar results to the MARAD study. In the SIRC study², they examined over 1,000 tank vessels of various sizes. The overall mean crew size on tankers in the SIRC study was 20, with a range of averages from 12 for the smallest vessels to 25 for the largest. SIRC examined over 2,900 dry cargo vessels as well. The overall mean crew size on

¹ United States Department of Transportation, Maritime Administration, Office of Financial and Rate Approvals, Foreign Flag Crewing Practices: A Review of Crewing Practices in U.S.-Foreign Ocean Cargo Shipping, Washington, DC, 2003, <<http://www.marad.dot.gov/publications/crewing/crewpract.htm>>.

² Winchester, N., Sampson, H., Shelly, T. (2006) An Analysis of Crewing Levels: Findings from the SIRC Global Labour Market Study, Seafarers International Research Centre (SIRC): Cardiff University, <<http://www.sirc.cf.ac.uk/pdf/Analysis%20of%20crewing%20levels.pdf>>

these vessels was 18, with a range of averages from 10 for the smallest vessels to 26 for the largest. Although size and vessel complexity may account for these variations, there are likely other factors such as vessel route and flag state requirements involved as well. The SIRC study does indicate statistically significant differences in crew sizes among different registry types for certain vessel categories.

9 Fundamentally, the issue of establishing the safe manning level of ships may be reduced to an optimization problem with multiple criteria under several constraints. Here, the goals may be viewed as achieving an adequate level of safety and ensuring the mariners' quality of life while minimizing labour costs. It is reasonable to assume that establishing the safe manning level ultimately comes down to balancing between the assumed safety and quality of life improvements gained by additional crew against the costs of additional crew. These factors must also be evaluated against other constraining issues such as applicable regulations, vessel characteristics and other constraints such as labour agreements. Ultimately, the challenge is in determining what benefits additional shipboard personnel bring to the vessel's operation and safety and what costs are reasonable.

10 Major influences on the cost of the crew are the number of crew, the overall crew mix (officers versus rating), the rates and licenses of the crew, and even the nationality of the crew, which can directly influence labour costs. Some of these factors are constrained further by macro policy issues such as IMO Conventions, labour agreements, and flag State regulations.

Recommendations

11 Given the multiple factors that affect both crew size and related safety concerns, a systematic, holistic approach is recommended to capture the complex relationships and thus support sound decision-making by the Sub-Committee.

12 In particular, an issue this complex merits careful and thorough consideration of all aspects of the problem. The United States believes that a multi-step approach is necessary to ensure a comprehensive review of the principles for establishing the safe manning levels of ships. These steps are:

- a. Examine the current state of crew complements in the maritime industry.
- b. Assess the safety of the current state to identify deficiencies (if any).
- c. Assess existing documents and instruments to identify gaps.
- d. Develop potential measures to address these gaps and deficiencies.
- e. Evaluate the measures in terms of feasibility and effectiveness.
- f. Develop and implement modifications to IMO instruments (mandatory and non-mandatory).

Action requested of the Sub-Committee

13 The Committee is invited to consider the information provided in this document, particularly the systematic and holistic approach for the review discussed in paragraph 12, and take action as appropriate.

ANNEX

FIGURE 1 - INFLUENCE DIAGRAM FOR ESTABLISHING THE SAFE MANNING LEVEL OF SHIPS

