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SUB-COMMITTEE ON STANDARDS OF
TRAINING AND WATCHKEEPING
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Agenda item 7

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**COMPREHENSIVE REVIEW OF THE STCW CONVENTION
AND THE STCW CODE**

Bridge Resource Management and Engine-room Resource Management

Submitted by Singapore

SUMMARY

Executive summary: This document contains a proposal by Singapore to amend STCW Code A to include key elements of Bridge Resource Management (BRM) and Engine-room Resource Management as a mandatory requirement

Action to be taken: Paragraph 7

Related documents: MSC 81/25; FSI 14/19; MSC 82/24 and STW 38/17

Introduction

1 The Sub-Committee on Flag State Implementation, at its fourteenth session (5 to 9 June 2006), discussed the outcome of the report of the Working Group on Casualty Analysis and Review of the Code for the Investigation of Marine Casualties and Incidents, which identified that a high number of casualties were attributed to poor Bridge Resource Management (BRM) practices. The report further stressed the importance of BRM training, and that the need to adopt BRM principles in the work place scenario was imperative.

2 The Maritime Safety Committee, at its eighty-second session (29 November to 8 December 2006), agreed that the STW Sub-Committee should consider this issue under the Sub-Committee's work programme on "Comprehensive review of the STCW Convention and the STCW Code", with a target completion date of 2008.

3 Currently, under section B-VIII/2 of the STCW Code Part B, companies are recommended to issue guidance to masters and officers based on the BRM principles. As compliance with Part B of the STCW Code is not mandatory, many do not put them into practice and many seafarers are not trained nor have proficiency in applying the BRM principles.

4 Analysis from some recent investigations into marine accidents has revealed failure of the crew to manage resources. Proficiency in resource management will enable bridge and engine room teams to optimize utilization of equipment, procedures and human resources to enhance situational awareness and decision making process to promote safety of life and protection of marine environment.

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5 Furthermore, the STW Sub-Committee, at its thirty-eighth session (22 to 26 January 2007), agreed on the need to consider making key elements of BRM and engine room resource management (ERM) mandatory in accordance with the following agreed principles of the comprehensive review of the STCW Convention and the STCW Code :

- (a) not to scale down the existing standards; and
- (b) to address inconsistencies, interpretations, MSC instructions already issued, outdated requirements and technological advances (STW 38/17, annex 11).

6 Accordingly, proposed amendments to the tables in sections A-II/1, A-III/2, A-III/1 and A-III/2 are set out in annex 1. Proposed consequential amendments to sections B-II/1, B-III/1, B-III/2 and B-VIII/2 are set out in annex 2.

Action requested of the Sub-Committee

7 The Sub-Committee is invited to note the information provided and take action as appropriate.

ANNEX 1

**PROPOSED AMENDMENTS TO PART 'A' OF THE SEAFARERS' TRAINING,
CERTIFICATION AND WATCHKEEPING (STCW) CODE**

1 At the end of the table A-II/1 relating to the Function: Navigation at operational level the following additional competence table is to be inserted:

Function: Navigation at the operational level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for Demonstrating competence	Criteria for evaluating competence
Bridge Resource Management	Knowledge of bridge resource management principles, including allocation of resources, assigning of duties, allocating tasks to be performed in a clear order of priority, collation, processing and interpretation of essential information from equipment and team in making operational decisions.	Assessment of evidence obtained from one or more of the following: .1 approved in service experience .2 approved training .3 approved simulator training	Behaviours exhibited during the demonstration of competence show an ability to meet the stated proficiencies. Communications amongst the team are effective and comply with established procedures. Decisions and actions maximize navigational safety.

2 At the end of the table A-II/2 relating to the Function: Navigation at management level the following additional competence table is to be inserted:

Function: Navigation at the management level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for Demonstrating competence	Criteria for evaluating competence
Bridge Resource Management	A thorough knowledge of bridge resource management principles, including: .1 allocation of resources .2 assigning of duties .3 allocating tasks to be performed in a clear order of priority .4 collation, processing and interpretation of essential information from equipment and team in making operational decisions	Assessment of evidence obtained from one or more of the following: .1 approved in service experience .2 approved training .3 approved simulator training	Behaviours exhibited during the demonstration of competence show an ability to meet the stated proficiencies. Communications amongst the team are effective and comply with established procedures. Decisions and actions maximize navigational safety.

3 At the end of the table A-III/1 relating to the Function: Marine Engineering at operational level, the following additional competence table is to be inserted:

Function: Marine Engineering at the operational level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for Demonstrating competence	Criteria for evaluating competence
Engine-room Resource Management	Knowledge of engine-room resource management principles, including allocation of resources, assigning of duties, allocating tasks to be performed in a clear order of priority, collation, processing and interpretation of essential information from equipment and team in making operational decisions.	Assessment of evidence obtained from one or more of the following: .1 approved in service experience .2 approved training .3 approved simulator training	Behaviours exhibited during the demonstration of competence show an ability to meet the stated proficiencies. Communications amongst the team are effective and comply with established procedures. Decisions and actions maximize navigational safety.

4 At the end of the table A-III/2 relating to the Function: Marine Engineering at management level the following additional competence table is to be inserted:

Function: Marine Engineering at the management level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for Demonstrating competence	Criteria for evaluating competence
Engine-room Resource Management	A thorough knowledge of engine-room resource management principles, including: .1 allocation of resources .2 assigning of duties .3 allocating tasks to be performed in a clear order of priority .4 collation, processing and interpretation of essential information from equipment and team in making operational decisions.	Assessment of evidence obtained from one or more of the following: .1 approved in service experience .2 approved training .3 approved simulator training	Behaviours exhibited during the demonstration of competence show an ability to meet the stated proficiencies. Communications amongst the team are effective and comply with established procedures. Decisions and actions maximize navigational safety.

ANNEX 2

**PROPOSED AMENDMENTS TO PART 'B' OF THE SEAFARERS' TRAINING,
CERTIFICATION AND WATCHKEEPING (STCW) CODE**

PART B

Section B-II/1

Guidance regarding the certification of officers in charge of a navigational watch on ships of 500 gross tonnage or more

1 The following new sub-title "Bridge resource management" and paragraphs 19 and 20 are inserted after the existing paragraph 18:

Bridge resource management

19 Companies should issue guidance on proper bridge procedures and promote the use of checklists appropriate to each ship, taking into account national and international guidance*.

20 Companies should also issue guidance to masters and officers in charge of the navigational watch on each ship concerning the need for continuously reassessing how bridge-watch resources are being allocated and used, based on bridge resource management principles such as the following:

- .1 a sufficient number of qualified individuals should be on watch to ensure all duties can be performed effectively;
- .2 all members of the navigational watch should be appropriately qualified and fit to perform their duties efficiently and effectively or the officer in charge of the navigational watch should take into account any limitation in qualifications or fitness of the individuals available when making navigational and operational decisions;
- .3 duties should be clearly and unambiguously assigned to specific individuals, who should confirm that they understand their responsibilities;
- .4 tasks should be performed according to a clear order of priority;
- .5 no member of the navigational watch should be assigned more duties or more difficult tasks than can be performed effectively;
- .6 individuals should be assigned at all times to locations at which they can most efficiently and effectively perform their duties, and individuals should be reassigned to other locations as circumstances may require;

* ICS *Bridge Procedures Guide* (Witherby Marine Publishing, 32/36 Aylesbury Street, London EC1R 0ET, UK) may be of assistance in the preparation of programmes.

- .7 members of the navigational watch should not be assigned to different duties, tasks or locations until the officer in charge of the navigational watch is certain that the adjustment can be accomplished efficiently and effectively;
- .8 instruments and equipment considered necessary for effective performance of duties should be readily available to appropriate members of the navigational watch;
- .9 communications among members of the navigational watch should be clear, immediate, reliable, and relevant to the business at hand;
- .10 non-essential activity and distractions should be avoided, suppressed or removed;
- .11 all bridge equipment should be operating properly and if not, the officer in charge of the navigational watch should take into account any malfunction which may exist in making operational decisions;
- .12 all essential information should be collected, processed and interpreted, and made conveniently available to those who require it for the performance of their duties;
- .13 non-essential materials should not be placed on the bridge or any work surface; and
- .14 members of the navigational watch should at all times be prepared to respond efficiently and effectively to changes in circumstances.

Section B-III/1

Guidance regarding the certification of officers in charge of an engineering watch in a manned engine-room or as designated duty engineers in a periodically unmanned engine-room

2 The following new sub-title “Engine-room resource management” and paragraphs 4 and 5 are inserted after the existing paragraph 3:

“Engine-room resource management

4 Companies should issue guidance on proper engine-room procedures and promote the use of check lists appropriate to each ship, taking into account national and international guidance.

5 Companies should also issue guidance to chief engineers and officers in charge of the engineering watch, manned or unmanned, on each ship concerning the need for continuously reassessing how engineering watch resources are being allocated and used based on engine-room resource management principles such as the following:

- .1 a sufficient number of qualified individuals should be on watch to ensure all duties can be performed effectively;

- .2 all members of the engineering watch should be appropriately qualified and fit to perform their duties efficiently and effectively or the officer in charge of the engineering watch should take into account any limitation in qualifications or fitness of the individuals available when making engineering and operational decisions;
- .3 duties should be clearly and unambiguously assigned to specific individuals, who should confirm that they understand their responsibilities;
- .4 tasks should be performed in a clear order of priority;
- .5 no member of the engineering watch should be assigned more duties or more difficult tasks than can be performed effectively;
- .6 individuals should be assigned at all times to locations at which they can most efficiently and effectively perform their duties, and individuals should be reassigned to other locations as circumstances may require;
- .7 members of the engineering watch should not be assigned to different tasks or locations until the officer in charge of the engineering watch is certain that adjustments can be accomplished efficiently and effectively;
- .8 instruments and equipment considered necessary for effective performance of duties should be readily available to appropriate members of the engineering watch;
- .9 communications among members of the engineering watch and between members of the engineering and navigational watches should be clear, immediate, reliable and relevant to the business at hand;
- .10 non-essential activity and distractions should be avoided, suppressed or removed;
- .11 all engine-room equipment should be operating properly and, if not, the officer in charge of the engineering watch should take into account any malfunction or inoperable equipment due to maintenance, which may exist when making operational decisions;
- .12 all essential information should be collected, processed and interpreted and made conveniently available to all for the performance of their duties;
- .13 non-essential materials should not be placed so as to hinder engine-room operations;
- .14 members of the engineering watch should at all times be prepared to respond efficiently and effectively to changes in circumstances;
- .15 clear and effective data monitoring to identify possible areas of concern in equipment or systems should be ensured so as to prevent breakdowns/accidents/incidents; and

- .16 effective methods of cross-checking information, data and indications should be developed to obviate the need for total reliance on any specific type of equipment, system or component.”

Section B-III/2

Guidance regarding the certification of chief engineer officers and second engineer officers of ships powered by main propulsion machinery of 3,000 kW propulsion power or more

- 3 replace existing text with “(see section B-III/1 for guidance)”.

Section B-VIII/2

Guidance regarding watchkeeping arrangements and principles to be observed

- 4 Delete titles “Bridge Resource Management” after existing paragraph 3, “Engine-room resource management” after existing paragraph 8, existing paragraphs 4, 5, 8-1 and 8-2. Consequently, renumber all paragraphs after paragraph 3.
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