INTERNATIONAL MARITIME ORGANIZATION

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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

"Ship-in-Campus" concept

Submitted by India

SUMMARY

Executive summary:	This document provides information with respect to innovation in pre-sea training and assessment of competency of marine engineers by introducing the "Ship-in-Campus" concept
Action to be taken:	Paragraph 19
Related documents:	MSC 83/28, paragraph 12.16 and STCW, code B-III/1

Background

1 The BIMCO/ISF Manpower Updates of 2005 have projected, *inter alia*, a shortage of Engineer Officers by 2010. As such, to cater to the expected world-wide shortage of adequately trained Engineer Officers for ships, there is an urgent need to not only train more engineers, but also to ensure that the training institutes have the appropriate facilities to train them to operate increasingly sophisticated ships in a safer and more efficient manner and to be confident and skilled enough to carry out efficient maintenance and repairs of onboard machinery. In order to meet these requirements, India has now made a provision in the curriculum and Institute's infrastructure to have a 'Ship-in-Campus' facility, so as to have ship's engine room with all working machinery and equipment installed within as per the general arrangement (GA) plan of an ocean-going ship. It is envisaged that this innovative facility in a Training Institute will be very effective in providing adequate hands-on skills and appropriate under-pinning knowledge to the trainees at pre-sea level. Under close supervision and mentoring the trainees will, it is hoped, develop the basic competency for overhaul, maintenance and correct fault diagnosis of ship's machinery and equipment. Not only they will become very familiar with a ship's engine room layout during the training period, but will also learn safe operating procedures of the engine room machinery, equipment and systems within the 'Ship-in-Campus' environment.

Introduction

2 The information provided contains the concept of 'Ship-in-Campus' as an innovation in work-based learning and modes of study for development of both knowledge and skill of the budding marine engineer. The facility of a ship in campus aims to equip students to work as marine engineers on sea-going ships using current in-service technology and time-tested skills. In addition, and more generally, this innovative facility within a campus aims to:

.1 provide a challenging, stimulating and self-rewarding study environment;

.2 develop and assess a range of key skills by means of opportunities provided in the learning objectives;

.3 provide a high level of work-based learning (WBL) through training sessions within the campus by also using engine simulators;

.4 provide through WBL a high level of integration of mechanical, design and systems engineering theory and practice in order to develop real world competencies in the support of integrated and complex ship-borne systems;

.5 provide an employer-led, university-level degree programme to develop marine engineering competences and enhance career opportunities within current marine engineering technology;

.6 accommodate student needs in relation to enhancing their career potential by enabling them to develop knowledge, understanding and skills in their chosen profession; and

.7 a diverse range of assessment methods are used, including appropriate STCW competence-based assignments, testing both knowledge and understanding and vocational applications in the workplace. Students are able to demonstrate analytical, transferable and subject-specific skills through oral, written and practical presentations, including a project presentation. These are fully in line with the requirements of the STCW Code for marine engineering competence at operational level.

Effectiveness of training:

3 All students undergoing the 4-year marine engineering degree courses are expected to develop the necessary academic and practical skills required of engineers in the merchant navy. All training courses and academic syllabi are in accordance to STCW 78, as amended and duly approved by Directorate General of Shipping.

4 The programme aims are clearly linked to the intended outcomes. Appropriate references are made to knowledge and understanding, cognitive skills, practical, professional or subject-specific skills, transferable and key skills.

5 WBL is central to the design and delivery of the programme. It is embedded in the curriculum and integrated as a continuous process throughout the course.

6 The programme aims and the intended learning outcomes are communicated primarily through the programme specification and the student Training and Assessment Record (T.A.R.) book. Although this book was only mandatory for the sea going phase, the Pre Sea TAR Books are meaningful and helpful to all stakeholders.

7 A diverse range of assessment methods is used, including appropriate competence based assignments, testing both knowledge and understanding and vocational applications in the workplace.

8 Students are able to demonstrate an appropriate range of employment-relevant skills. Examples include practical work relating to designing, building, testing and fault finding on hydraulic systems; planned maintenance schedules on live marine engineering systems according to manufacturers' specifications; calibration, testing and fault diagnosis on marine main engine power plant, boilers, main engine room control panels and electric power generation systems and controls.

9 As well as encouraging students to demonstrate practical vocationally relevant skills, integrating WBL and academic study, the programme aims to develop habits of self study and independent learning as a basis for progression to the final year of an engineering degree.

10 WBL is fully integrated into the programme, with these elements delivered by Senior Instructors/Marine Engineers, all of whom may have recently completed service on merchant ships at sea. Students are complimentary about the integration of WBL with classroom material. They fully endorsed the use of marine engineers as faculty for delivery of training lessons and assessment, as this meant that they were being taught and assessed by practitioners, using current on-board equipment.

11 Learning resources are deployed in a realistic marine engineering context. The shipboard environment is replicated wherever possible giving a realistic feel to the learning and assessment process. For example, a working main marine engine with all auxiliaries is made available for students. The Ship-in-Campus has facility for bilge pumping, oily water separator, purifiers, boiler, various alarm systems, etc. The varied and up-to-date range of classroom, laboratory and WBL resources enables students to enhance their engineering competence by designing and building pneumatic and hydraulic systems models, using planned maintenance schedules on systems according to manufacturers' specifications, and structuring diagnostic testing for the analysis, location and rectification of faults on modem marine systems. This enhances student confidence with reference to their future work environment.

12 The programme fully meets the STCW underlying requirements for employer involvement in the design and delivery of the curriculum and in the assessment of students. This is fundamental to student achievement at every level. University validation and partnership provides appropriate external recognition of both academic and practical achievement.

13 A range of teaching and learning techniques is used, including formal lectures, tutorials, practical work-based assignments, project development and laboratory work. Students confirm that these strategies successfully integrate the academic and vocational elements of the programme.

14 The delivery of topics within the programme allow a logical progression from theoretical introduction in a traditional classroom-based environment, through laboratory-based practical applications of underpinning concepts to final fault diagnosis and rectification on ship-borne systems. The roles and tasks experienced by the students are all commensurate with future employment, and especially relevant when introducing and demonstrating practical, vocationally specific applications of theoretical underpinning knowledge.

15 However, the unique demands of the employer necessitate the development of highly practically skilled graduates focusing on shipboard equipment specific maintenance competence.

16 Access to information and communication technology, with appropriate technical assistance, enables students to become familiar with sophisticated highly specialised CBT and PC-based systems, and high fidelity simulation and training rigs. All students have access to the internet.

17 The on-site technical library, while comprehensively stocked with books of reference appropriate to ships' equipment in the Merchant Navy, should be organized as a learning resource centre.

18 To support these facilities, the staff involved in instruction, assessment and administration are mostly serving or retired marine engineering personnel with recent experience in all aspects of operation of marine systems. In addition, sea going personnel can generally be redeployed after intermittent sea service so that the staffing complement is continually being replaced by others fresh from sea duty, which brings current experiences of ship-borne machinery operations to the programme. This facilitates and enhances the relevance, credibility and currency of WBL.

19 Typical photographs of a Ship-in-Campus in Indian maritime institutes are given in the annex.

Action requested of the Sub-Committee

20 The Sub-Committee is invited to note the information above and take action as appropriate while carrying out the comprehensive review of STCW, code A-III/1.

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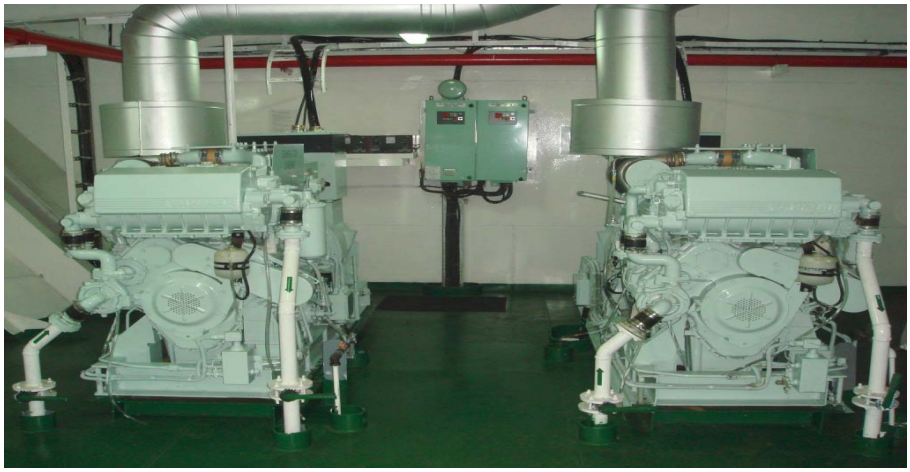
ANNEX

TYPICAL PHOTOGRAPHS OF A SHIP-IN-CAMPUS IN INDIAN MARITIME INSTITUTES

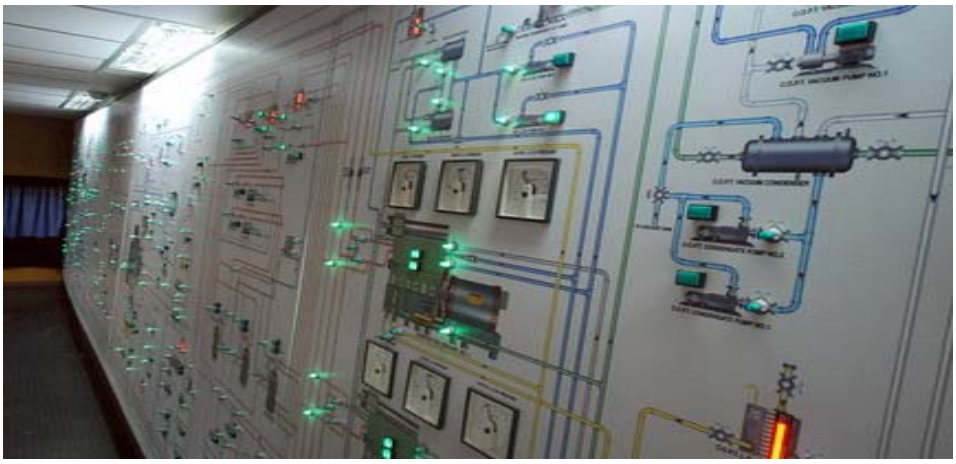
Ship-In-Campus – Outside View

Engine Room – Main Engine

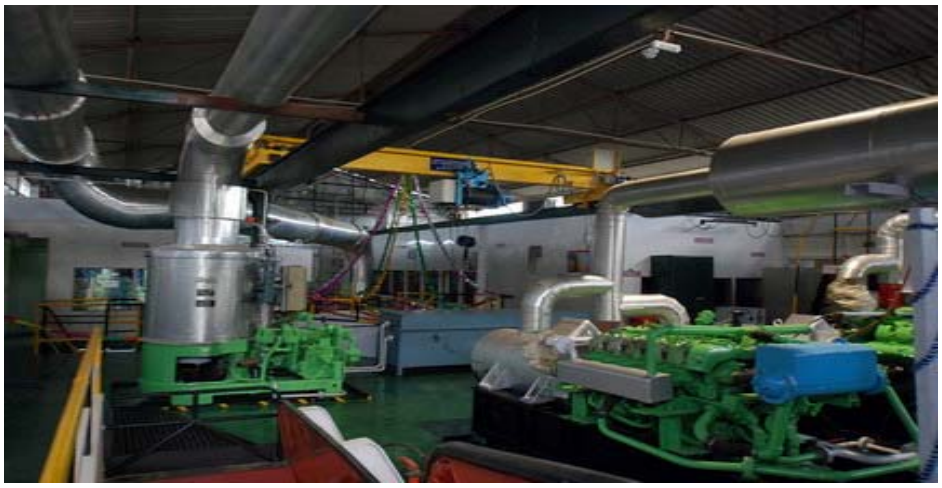
Ship-in-Campus – ER Bottom Deck



Engine Room – Auxiliary Engines



Engine Room – Control Panel



Engine Room – Machineries