

U.S. Department of
Homeland Security

United States
Coast Guard



Commandant
United States Coast Guard

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COMDTCHANGENOTE 16721
NVIC 03-14
April 11, 2019

NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 03-14, CH-1

Subj: CH-1 TO GUIDELINES FOR APPROVAL OF TRAINING COURSES AND PROGRAMS,
NVIC 03-14, COMDTPUB 16721

Ref: (a) Guidelines for Approval of Training Courses and Programs, NVIC 03-14, COMDTPUB
16721

1. PURPOSE. This Commandant Change Notice publishes CH-1 to reference (a).
2. ACTION. The Coast Guard will use 46 CFR Subchapter B, Part 10, Subpart D and NVIC 03-14 when evaluating requests for approval of training courses and programs. Officers in Charge, Marine Inspection (OCMIs) should bring this notice to the attention of the maritime industry within their zones of responsibility.
3. DIRECTIVES AFFECTED. With the release of this Commandant Change Notice, NVIC 03-14 is updated.
4. DISCUSSION.
 - a. On October 1, 2015, the SS El Faro, a 40-year-old cargo ship owned by TOTE Maritime Puerto Rico and operated by TOTE Services, Inc. was on a regular route from Jacksonville, Florida, to San Juan, Puerto Rico. It foundered and sank during Hurricane Joaquin in the Atlantic Ocean about 40 nautical miles northeast of Acklins and Crooked Island, Bahamas. The ship had sailed directly into the path of Hurricane Joaquin. All those aboard perished in the sinking.
 - b. The National Transportation Safety Board (NTSB) identified a number of safety issues and made safety recommendations to the U.S. Coast Guard and other agencies and organizations. Among those to the Coast Guard were recommendations concerning the content of training provided in Basic Meteorology, Advanced Meteorology, Advanced Shiphandling, and Bridge Resource Management courses for mariners seeking STCW officer endorsements. This Commandant

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A																											
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NON-STANDARD DISTRIBUTION:

Change Notice implements those recommendations concerning course content by providing additional guidance to Enclosure (3) of NVIC 03-14.

- c. Training providers holding approvals for these courses should review and if necessary, revise their courses as part of their continuous improvement process to ensure that the topics identified above are included and adequately covered in their courses. We remind providers that any substantial modification of an approved course curricula should be submitted to the National Maritime Center (NMC) for review and approval before they are implemented.
 - d. The NMC will review courses submitted for original approval, modification, or renewal of approval to ensure inclusion of the topics contained in Enclosure (3) of NVIC 03-14.
5. DISCLAIMER. This guidance is not a substitute for applicable legal requirements, nor is it itself a regulation. It is not intended to, nor does it impose legally binding requirements on any party. It represents the Coast Guard's current thinking on this topic and is issued for guidance purposes to outline methods of best practice for compliance with applicable law. You can use an alternative approach if the approach satisfies the requirements of the applicable statutes and regulations.
 6. MAJOR CHANGES. This Commandant Change Notice revises the guidance found in Enclosure (3) of NVIC 03-14 to implement the safety recommendations of the NTSB concerning the content of Coast Guard approved courses for Basic Meteorology, Advanced Meteorology, Advanced Shiphandling, and Bridge Resource Management.
 7. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS.
 - a. The development of this Commandant Change Notice and the general policies contained within it have been thoroughly reviewed by the originating office, and are categorically excluded (CE) under current CE #A3 from further environmental analysis, in accordance with Section 2.B.2 and Appendix A, DHS Instruction Manual 023-01-001-01, Revision 01, Implementation of the National Environmental Policy Act (NEPA). Because this NVIC implements, without substantive change, the applicable Commandant Instruction or other federal agency regulations, procedures, manuals, and other guidance documents, Coast Guard categorical exclusion #A3 is appropriate.
 - b. This Commandant Change Notice will not have any of the following: significant cumulative impacts on the human environment; substantial controversy or substantial change to existing environmental conditions; or inconsistencies with any Federal, State, or local laws or administrative determinations relating to the environment. All future specific actions resulting from the general policies in this NVIC must be individually evaluated for compliance with the National Environmental Policy Act (NEPA), DHS and Coast Guard NEPA policy, and compliance with all other environmental mandates.
 8. DISTRIBUTION. No paper distribution will be made of this Commandant Change Notice. An electronic version will be located at <http://www.uscg.mil/hq/cg5/nvic>.

9. PROCEDURE. Remove and insert the following pages of NVIC 03-14:

Remove

Enclosure (3)

Insert

Enclosure (3) CH-1

10. RECORDS MANAGEMENT CONSIDERATIONS. This Commandant Change Notice has been thoroughly reviewed during the directives clearance process, and it has been determined there are no further records scheduling requirements, in accordance with the Federal Records Act (44 U.S.C. 3101 et seq.), NARA requirements, and the Information and Life Cycle Management Manual, COMDTINST M5212.12 (series). This policy does not create significant or substantial change to existing records management requirements.

11. FORMS/REPORTS. None.

12. REQUEST FOR CHANGES. All requests for changes or questions regarding implementation of NVIC 03-14 and this Commandant Change Notice should be directed to the Mariner Credentialing Program Policy Division (CG-MMC-2), at (202) 372-2357 or MMCPolicy@uscg.mil.



J. P. NADEAU
Rear Admiral, U. S. Coast Guard
Assistant Commandant for Prevention Policy

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- b. As specified in 46 CFR 10.402(a) (for courses) and 46 CFR 10.407(b) (for training programs), the Coast Guard may approve training for one or more of the following reasons:
- 1) In lieu of a portion of a requirement for sea service;
 - 2) To substitute for the following examinations administered by the Coast Guard:
 - i) National deck officer endorsements for less than 200 GRT;
 - ii) To increase the scope of a national deck officer endorsement for less than 1,600 GRT from near coastal to oceans;
 - iii) National engineering officer endorsements for 4,000 HP or less; and
 - iv) National ratings endorsements;
 - 3) To meet professional competency requirements; and
 - 4) To meet regulatory training requirements.

5. DISCUSSION.

a. General.

- 1) Under 46 CFR 10.403 and 46 CFR 10.407, Coast Guard approved courses and programs must be taught utilizing an approved curriculum, by approved instructors, and at an approved site.
- 2) The validity period during which an applicant may use a course completion to meet credentialing requirements is as follows:
 - i) Any time limit prescribed by regulation, e.g. five years for the “Tankship: Dangerous Liquids” course specified in 46 CFR 13.201(c)(4); and
 - ii) One year for courses that substitute for an examination given by the Coast Guard; and
 - iii) Five years for all other courses.

b. Requests for initial approval.

- 1) Training providers are encouraged to submit their courses and programs in an electronic format. Submission of courses on paper may require additional processing time. Requests for course/program approval should be submitted to the NMC at:
 - Your designated homeport account if you have previously approved credentials to access the Coast Guard’s on-line submittal tools:
 - By email to NMCCourses@uscg.mil; or,

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- By mail on CD/DVD or on paper to:

Commanding Officer (NMC-2)
U.S.C.G. National Maritime Center
100 Forbes Drive
Martinsburg, WV 25404

- 2) Courses and programs should be documented as specified in 46 CFR 10.402(b) (for courses) and 46 CFR 10.407(c) (for programs) and should contain the following:
 - i) Cover Letter containing the information identified in 46 CFR 10.402(b)(1) or 10.407(c)(1);
 - ii) Part A – Course Framework;
 - iii) Part B – Course Outline;
 - iv) Part C – Detailed Teaching Syllabus;
 - v) Part D – Lesson Plans and Instructor Notes;
 - vi) Part E – Evaluations, including:
 - a) The methodology used to measure a student’s knowledge, performance, or level of achievement;
 - b) Assessment instruments to determine whether the student has achieved the desired level of knowledge, understanding, or proficiency; and
 - c) The methodology used to measure the effectiveness of the training or instructor;
 - vii) Sample Course Completion Certificate; and
 - viii) In order to facilitate communication and reduce processing time, the training provider should provide their preferred point of contact to be granted user privileges for the Coast Guard’s electronic submittal program.
 - ix) A sample course approval package is provided in Enclosure (1). The Coast Guard encourages training providers to submit approval requests in electronic format, either by e-mail or contained on a CD in MS-Word or PDF format. The Coast Guard cannot accept portable media such as USB “thumb” drives. Courses submitted on paper will require additional processing time.
- 3) Training programs should be documented as specified in 46 CFR 10.407(c) and should contain the following:
 - i) Cover letter that includes all information specified in 46 CFR 10.407(c)(1);
 - ii) Goal statement describing:
 - a) Specific performance behaviors to be measured;
 - b) Conditions under which the performance behavior(s) will be exhibited; and
 - c) Level of performance behavior(s) that is to be achieved;
 - iii) Performance objectives, these should include entry and exit criteria;
 - iv) Assessment instruments;

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- v) Instructor information as specified in 46 CFR 10.402(b)(2)(iii) and 46 CFR 10.407(c)(5) and subparagraph e below;
 - vi) Site information;
 - vii) Teaching syllabus describing:
 - a) Instructional strategy, including:
 - The order of presentation;
 - The level of interaction, including the student-to-teacher ratio;
 - Feedback;
 - Remediation;
 - Testing strategies; and
 - Media used to present information;
 - b) Instructional materials, including lesson plans containing:
 - Pre-instructional activities;
 - Content presentation;
 - Student participation;
 - Assessment processes; and
 - Other instructional activities, such as homework and reading assignments;
 - c) Course surveys on the relevance and effectiveness of the training completed by students; and
 - d) Course schedule, including the duration and order of lessons, and an indication as to whether each lesson is:
 - A classroom lecture;
 - A practical demonstration;
 - A simulator exercise;
 - An examination; or
 - Another method of instructional reinforcement; and
 - viii) A sample or program completion certificate.
- 4) The NMC will notify, in writing, each training provider when a course or program is either approved or denied. If denied, the NMC will state the reasons for denial and recommend corrective actions to be taken (46 CFR 10.402(c) and 46 CFR 10.407(d)).
- 5) Unless surrendered, suspended, or withdrawn, an approval is valid for up to a maximum of 5 years after issuance, unless the school ceases operation; the school gives notice that it will no longer offer the course or program; the owner or operator fails to submit any required information; or any change occurs in the ownership of the school (46 CFR 10.402(d) and 46 CFR 10.407(e)).
- 6) The terms of the approval shall be stated in the approval letter. Failure to adhere to these terms may be grounds for the Coast Guard to refuse acceptance of students' completion certificates (46 CFR 10.402(e)(2) and 46 CFR 10.407(f)(2)) or for

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suspension or withdrawal of the approval (46 CFR 10.402(g) and (h) and 46 CFR 10.407(h) and (i)).

c. Requests for renewal of an approval.

- 1) If the owner or operator of a training school desires to have a course or program approval renewed, the owner or operator submits a request to the NMC accompanied by the cover letter, instructor information, site information, and teaching syllabus.
- 2) A request for the renewal of an approved course or program should be submitted to the NMC at least 90 days prior to the expiration of the current approval.
- 3) If the Coast Guard is satisfied that the content and quality of instruction remains satisfactory and meets all relevant regulatory requirements, the approval will be renewed.

d. Requests for changes or modification to an approved course or program.

- 1) Any changes to the course or program approval or the content of the training will be handled as a request for renewal of an approval, or as a request for an original approval, depending on the nature and scope of the change (46 CFR 10.402(e) and 46 CFR 10.407(f)).

e. Requests for approval of new instructors.

- 1) Requests to add new instructors to an existing approved course or program should be sent to the NMC as described above and, as specified in 46 CFR 10.402(b)(2)(iii) and 46 CFR 10.407(c)(5), should include documentation that the proposed instructor:
 - i) Has either experience, training, or evidence of the ability to use effective instructional techniques;
 - ii) Is qualified in the task for which the training is being conducted and has relevant experience; and
 - iii) Has attained a level of experience and qualification equal or superior to the relevant level of knowledge, skills, and abilities described in the course's performance objective.
- 2) Enclosure (2) provides additional guidance on instructors, including the general standards the Coast Guard will use to approve a proposed instructor. Due to the unique nature of the maritime industry and the varied experience obtained by mariners this table is neither all inclusive nor absolutely prescriptive.

f. Requests for site approval. Training providers wishing approval to hold their course or program at a site other than that specified in the approved curriculum should submit a written request to the NMC at the address in paragraph 5.b.1 of this NVIC, or to NMCSiteApprovals@uscg.mil. [46 CFR 10.402(b)(2)(iv)(B) and 10.407(c)(6)]

- 1) Requests for approval of new or alternate training sites should identify the course(s) to be given at the proposed location. Requests should include a description of the proposed facility along with photographs showing multiple views of the space,

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including the exterior, and diagrams or detailed site plan(s) with room measurements of the alternate site location that indicate the necessary dimensions and the locations of tables, chairs, podiums, training aids, etc. Training providers are encouraged to provide this information electronically, submission of paper documents will require additional processing time. Proposed spaces for classroom lectures should allow a minimum of 24 square feet per student, not including space for the instructor's table or podium. If this information is provided, it will usually not be necessary for NMC staff to visit a site in person in order to approve its use.

- 2) The NMC will ensure the site is safe and suitable to the needs of the course and the students. If the facility is found acceptable, the school will be notified in writing. Any special conditions for convening the course at the alternate site should be noted in the letter approving the alternate site.
 - 3) The NMC will respond to all requests in a timely manner, usually in 15 business days or less.
 - 4) The course provider may only use the approved curriculum and instructors to present courses at alternate sites.
- g. Course content. Guidance on course content and duration is provided in Enclosure (3).
- h. Use of simulators. The Coast Guard encourages appropriate use of simulators to ensure the quality and consistency of training and assessment, and for training that cannot be reasonably and/or safely performed aboard ship. Additional guidance on the use of simulators is provided in Enclosure (4).
- i. Distance and e-learning. Training may be offered by distance or e-learning. Additional guidance for these courses is provided in Enclosure (5).
- j. Administration and recordkeeping.
- 1) Records. 46 CFR 10.403(a)(6) requires every organization offering Coast Guard approved training to keep physical or electronic copies of the following records for at least 5 years after the end of each student's completion or disenrollment from a course or program:
 - i) A copy of each student's examination scores;
 - ii) A copy of each examination or, in the case of a practical test, a report of such test;
 - iii) A record of each student's classroom attendance;
 - iv) A copy of each student's course or program completion certificate, as appropriate;
 - v) A summary of changes or modification to the last course submittal (under 46 CFR 10.403(a)(7), significant changes must be approved by the NMC);

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- vi) A list of all locations at which the training course or program was presented and the number of times it was presented at each location;
 - vii) The name(s) of the instructor(s) who taught the course, not including lab assistants or other non-teaching assistants;
 - viii) The number of students who began the training;
 - ix) The number of students who successfully completed the training;
 - x) The number of students who were required to retest;
 - xi) The number of students who were required to retake the entire course; and
 - xii) The number of students who were required to retake a portion of the course.
- 2) Audits. 46 CFR 10.403(a)(8) requires each training provider with a Coast Guard approved course or program to conduct an internal audit midway through the term of the course or program's approval and maintain the results of the audit for a period of not less than 5 years. The audit will evaluate whether:
- i) Records are being maintained according to these regulations;
 - ii) The course is being presented in accordance with the approval letter; and
 - iii) Surveys from students indicate that the course or program is meeting their needs.
- 3) 46 CFR 10.403(a)(9) requires a school with approved courses or an approved program to, at any time, allow the Coast Guard to:
- i) Inspect its facilities, equipment, and records, including scholastic records;
 - ii) Conduct interviews and surveys of students to aid in course evaluation and improvement;
 - iii) Assign personnel to observe or participate in the course of instruction; and
 - iv) Supervise or administer the required examinations or practical demonstrations. For courses or programs that are approved to substitute for an examination given by the Coast Guard, this may include the substitution of an applicable Coast Guard examination for the examination prepared by the school.
 - v) Course Completion Documentation. Course providers are encouraged to submit course completion data to the Coast Guard electronically using a system provided by the Coast Guard.
- k. Suspension and/or Withdrawal of Approval.
- 1) Suspension. The Coast Guard may suspend a course or program approval if it determines that a specific course does not comply with the applicable provisions of 46 CFR parts 10, 11, 12, or 13; the requirements specified in the course approval

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letter; or the course's approved curriculum. (46 CFR 10.402(g) and 46 CFR 10.407(h))

- i) If the Coast Guard determines that a course or program is not complying with these requirements, the Coast Guard will notify the approval holder in writing of the intent to suspend course or program approval and the reasons for suspension.
 - ii) The Coast Guard will notify the approval holder that the specific course or program fails to meet applicable requirements and explain how the deficiencies can be corrected;
 - iii) The Coast Guard may grant the approval holder up to 90 days to correct the deficiency; and
 - iv) If the approval holder fails to correct the identified conditions, the course or program's approval will be suspended.
 - v) The Coast Guard will not accept students' course or program completion certificates for training that is given during a period of suspension.
 - 2) Withdrawal of Approval. The Coast Guard may withdraw approval of any course or program when the approval holder fails to correct the deficiencies in a suspended course within 90 days or upon determining that the approval holder has demonstrated a pattern or history of:
 - i) Failing to comply with the applicable regulations or the course or program approval requirements;
 - ii) Deviating from approved program or course curricula;
 - iii) Presenting instructional material in a manner that does not achieve the learning objectives; or
 - iv) Falsifying any document required and integral to the conduct of the course or program, including, but not limited to; attendance records; written test grades; course completion grades; or assessment of practical demonstrations.
 - 3) Appeals. Anyone directly affected by the denial, suspension or withdrawal of the approval of a course or program may request reconsideration and appeal of the decision as set forth in 46 CFR 1.03-40.
6. Excerpts of the associated portions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW Convention) and the Seafarers' Training, Certification and Watchkeeping Code, as amended (STCW Code) are provided in Enclosure (6).
7. DISCLAIMER. This guidance is not a substitute for applicable legal requirements, nor is it itself a regulation. It is not intended to nor does it impose legally-binding requirements on any party. It represents the Coast Guard's current thinking on this topic and is issued for guidance purposes to outline methods of best practice for compliance with applicable law. You can use an alternative approach if the approach satisfies the requirements of the applicable statutes and regulations.


8. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS.

- a. The development of this NVIC and the general policies contained within it have been thoroughly reviewed by the originating office, and are categorically excluded (CE) under current USCG CE # 33 from further environmental analysis, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1 (series). Because this NVIC implements, without substantive change, the applicable Commandant Instruction or other federal agency regulations, procedures, manuals, and other guidance documents, Coast Guard categorical exclusion #33 is appropriate.
- b. This NVIC will not have any of the following: significant cumulative impacts on the human environment; substantial controversy or substantial change to existing environmental conditions; or inconsistencies with any Federal, State, or local laws or administrative determinations relating to the environment. All future specific actions resulting from the general policies in this NVIC must be individually evaluated for compliance with the National Environmental Policy Act (NEPA), DHS and Coast Guard NEPA policy, and compliance with all other environmental mandates.

9. RECORDS MANAGEMENT CONSIDERATIONS. This NVIC has been thoroughly reviewed during the directives clearance process, and it has been determined there are no further records scheduling requirements, in accordance with Federal Records Act, 44 U.S.C. 3101 et seq., NARA requirements, and Information and Life Cycle Management Manual, COMDTINST M5212.12 (series). This policy does not create significant or substantial change to existing records management requirements.

10. FORMS/REPORTS. None.

11. COMMENTS/QUESTIONS. Comments or questions regarding this NVIC should be directed to the Mariner Credentialing Program Policy Division (CG-CVC-4) at MMCPolicy@uscg.mil or (202) 372-2357.



J. A. SERVIDIO
Rear Admiral, U. S. Coast Guard
Assistant Commandant for Prevention Policy

- Encl: (1) Sample Course Approval Package
(2) Guidance on Instructor Qualifications
(3) Course Curricula Guidelines
(4) Guidance for Courses Using Simulators
(5) Guidance for Distance and e-Learning Courses
(6) Excerpts from STCW Convention and STCW Code

Cover Letter

[46 CFR 10.402(b)(1)]

[46 CFR 10.407(c)(1)]

School Letterhead

Date

Commanding Officer (NMC-2)
U.S.C.G. National Maritime Center
100 Forbes Drive
Martinsburg, WV 25404

Re: Request for Approval of [Identify course]

Dear Sir/Madam:

Enclosed please find the following documentation for our [Identify course]:

- Part A – Course Framework;
- Part B – Course Outline, including course schedule;
- Part C – Detailed Teaching Syllabus;
- Part D-1 – Lesson Plans
- Part D-2 – Instructors Notes;
- Part E – Evaluations; and
- Sample Course Completion Certificate.

This course will be given at our facility at [location]. This course is [provide a general description and overview of the course].

We request this course be approved to satisfy the training requirements of [CFR citation] and [STCW citation].

The following personnel should be granted online access to submit future course approval requests and upload course completion data:

Name (last, First, MI)
Email address
Phone number

Thank you for your assistance and cooperation. Please contact me if you have any questions or comments.

Sincerely,

_____/s/

[Name]

[Title]

Course Name

Part A

Course Framework

[46 CFR 10.402(b)(2)]

■ **Scope**

This course is intended to [Describe the purpose of the course, including all relevant CFR and STCW sections].

■ **Objective**

Each student who successfully completes this course will [Describe learning objectives and desired outcomes for the course].

■ **Entry Standards**

This course is open to [Describe intended audience for the course]. Each student should have [Describe prerequisite qualifications to enroll in the course].

■ **Course Limitations (Student/Instructor Ratio)**

The number of candidates per course shall not exceed _____. Lab exercises are conducted as a group for instruction and individually for participation and assessment. The student to instructor ratio will be ___/___ for labs / assessments and ___/___ for classroom instruction.

■ **Course Completion Requirements**

In order to successfully complete this course, each candidate must obtain a grade percentage of not less than ___% on all examinations and successfully complete each lab exercises and practical demonstrations. All lab assignments, homework assignments, exercises, and tests must be completed and returned to the instructor for credit. A course completion certificate will not be issued if the course requirements are not completed in full.

■ **Course Completion Certificate**

Each student who successfully completes this course will be issued a course completion certificate. The certificate includes the candidate's name, and the date when the course was completed. It will also include the name of the course as approved by the Coast Guard, the approval granted to the course by the Coast Guard, and the Coast Guard course code. This certificate should be presented to the Coast Guard when applying for endorsements to a Merchant Mariner Credential (MMC).

■ Re-Test Policy

Students are permitted to re-take a failed examination or an unsuccessful lab exercise or practical demonstrations no more than twice. For written examinations, a new test will be given that does not contain any questions that appeared on previous examinations, quizzes, or homework given to the student. A student that fails an examination or cannot successfully complete an exercise or demonstrations after three attempts will be required to re-take the entire course.

■ Course Documentation

In accordance with 46 CFR 10.403(a)(6), the following records will be retained for at least 5 years after the end of each student's completion or disenrollment from the course:

- (i) All students' examination scores and assessment results;
- (ii) Copies of each examination or, in the case of a practical test or competency assessment, a report of such test;
- (iii) A record of each student's classroom attendance;
- (iv) A copy of each student's course completion certificate or program completion certificate, as appropriate.
- (v) A summary of changes or modification to the last course submittal;
- (vi) A list of all locations at which the training course was presented and the number of times it was presented at each location;
- (vii) The name(s) of the instructor(s) who taught the course and proctors who administered examinations;
- (viii) The number of students who began the training;
- (ix) The number of students who successfully completed the training;
- (x) The number of students who were required to retest;
- (xi) The number of students who were required to retake the entire course; and
- (xii) The number of students who were required to retake a portion of the course.

■ Staff Requirements

Proposed instructors and their qualifications are enclosed. [*Attach instructor CVs or similar as an addendum to this course framework.*]

All training and instruction is provided by qualified personnel as approved by the Coast Guard. The qualifications of full-time and adjunct instructors are in accordance with our Quality Standards System and are described in the QSS Management Manual. Each instructor has practical experience and/or professional training in the discipline described in the scope and objective of the course.

■ **Facilities and Equipment**

This course will be given at our facility in _____. Prior approval will be obtained from the Coast Guard before giving the course at any other location.

Lectures are presented in an appropriate classroom setting. Labs are conducted in the classroom or an appropriate laboratory / workshop area. Classrooms are equipped with the following equipment: _____. [Attach relevant specifications for course equipment, floor plans, and other documentation as appropriate.]

■ **Teaching Aids (A)**

- A1 Instructor Manual (Part D of the course).
- A2 Projector
- A3 VCR
- A4 Lecture / Lab Presentations
- A5 Text Books / Student Handout Booklets

■ **References (R)**

- R1 *Title of the Reference*, Publisher, Date
- R2 *Title of the Reference*, Publisher, Date

■ **Textbooks (T)**

- T1 Author's Name, *Title of the Textbook*, 1st ed., Publisher, Date, ISBN
- T2 Author's Name, *Title of the Textbook*, 1st ed., Publisher, Date, ISBN

■ **Videos (V)**

- V1 Title of Video Tape, (Time length), Producer, Date
- V2 Title of Video Tape, (Time length), Producer, Date

Course Name

Part B

Course Outline

[46 CFR 10.402(b)(3)]

Subject Area	Lecture Hours	Simulation/Exercises
0.0 <u>Introduction</u>		
0.1 <i>Sub-Topic</i>	0.5	--
.1 <i>Sub-Sub Topic</i>		
.2 <i>Sub-Sub Topic</i>		
.3 <i>Sub-Sub Topic</i>		
1.0 <u>Subject Area</u>		
1.1 <i>Topic</i>	1.0	0.5
.1 <i>Sub Topic</i>		
.2 <i>Sub Topic</i>		
.3 <i>Sub Topic</i>		
1.2 <i>Topic</i>	1.0	0.5
.1 <i>Sub Topic</i>		
.2 <i>Sub Topic</i>		
.3 <i>Sub Topic</i>		
2.0 <u>Subject Area</u>		
2.1 <i>Topic</i>	1.0	0.5
.1 <i>Sub Topic</i>		
.2 <i>Sub Topic</i>		
.3 <i>Sub Topic</i>		
2.2 <i>Topic</i>	1.0	0.5
.1 <i>Sub Topic</i>		
.2 <i>Sub Topic</i>		
.3 <i>Sub Topic</i>		
2.3 <i>Topic</i>	1.0	0.5
.1 <i>Sub Topic</i>		
.2 <i>Sub Topic</i>		
.3 <i>Sub Topic</i>		
Total	5.5	2.5
Total for the entire course	8.0	

Course Schedule

[46 CFR 10.402(b)(3)(ii)]

DAY	0800-0930	0940-1100	1100-1200	1200-1330	1340-1500	1510-1600
Mon	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic	Lunch	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic
Tue	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic	Lunch	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic
Wed	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic	Lunch	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic
Thu	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic	Lunch	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic
Fri	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic	Lunch	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic	Primary Topic Sub-Topic Sub Topic

Course Name

Part C

Detailed Teaching Syllabus

[46 CFR 10.402(b)(4)]

The detailed teaching syllabus indicates the contents of the course and the appropriate references and teaching aids.

■ Learning Objectives

This detailed teaching syllabus is written in a learning-objective format in which the objective describes what the trainee must do to demonstrate that knowledge has been transferred. This format is an appropriate teaching and assessment tool to express:

- The depth of understanding of a subject and the degree of familiarization with a subject on the part of the student; and
- What capabilities the student should have and be able to demonstrate.

All objectives are understood to be prefixed by the words: "The expected learning outcome is that the trainee _____."

In order to assist the instructor, references are shown against the learning objectives to indicate references and publications, textbooks, additional technical material and teaching aids, which the instructor may wish to use when preparing to deliver course material. The material listed in the course framework has been used to structure the detailed teaching syllabus.

- References (indicated by R)
- Textbooks (indicated by T)
- Teaching aids (indicated by A)
- Videos (indicated by V)

Detailed Teaching Syllabus

Lesson 0.0: Introduction

Total Hours: 0.5

0.1 <i>Topic</i>	<i>References, Textbooks</i>	<i>Teaching Aids, Videos</i>
<ul style="list-style-type: none"> .1 <i>Training Outcome 0.1.1</i> .2 <i>Training Outcome 0.1.2</i> .3 <i>Training Outcome 0.1.3</i> 		

Lesson 1.0: Subject Area

Total Hours: 3.0

1.1 <i>Topic</i>	<i>References, Textbooks</i>	<i>Teaching Aids, Videos</i>
<ul style="list-style-type: none"> .1 <i>Training Outcome 1.1.1</i> .2 <i>Training Outcome 1.1.2</i> .3 <i>Training Outcome 1.1.3</i> 		

1.2 <i>Topic</i>	<i>References, Textbooks</i>	<i>Teaching Aids, Videos</i>
<ul style="list-style-type: none"> .1 <i>Training Outcome 1.2.1</i> .2 <i>Training Outcome 1.2.2</i> .3 <i>Training Outcome 1.2.3</i> 		

Lesson 2.0: Subject Area

Total Hours: 4.5

2.1 <i>Topic</i>	<i>References, Textbooks</i>	<i>Teaching Aids, Videos</i>
<ul style="list-style-type: none"> .1 <i>Training Outcome 2.1.1</i> .2 <i>Training Outcome 2.1.2</i> .3 <i>Training Outcome 2.1.3</i> 		

2.2 <i>Topic</i>	<i>References, Textbooks</i>	<i>Teaching Aids, Videos</i>
<ul style="list-style-type: none"> .1 <i>Training Outcome 2.2.1</i> .2 <i>Training Outcome 2.2.2</i> .3 <i>Training Outcome 2.2.3</i> 		

2.3 <i>Topic</i>	<i>References, Textbooks</i>	<i>Teaching Aids, Videos</i>
<ul style="list-style-type: none"> .1 <i>Training Outcome 2.3.1</i> .2 <i>Training Outcome 2.3.2</i> .3 <i>Training Outcome 2.3.3</i> 		

Course Name

**Part D-1
Lesson Plans**

[46 CFR 10.402(b)(5)]

SUBJECT AREA: _____ **LESSON NO.** _____

DURATION: 3 Hours

Main Element Learning Objective	Teaching Method	Textbook	Reference	Video	Time (Minutes)
1.1 Topic #1					
Training Outcome 1.1.1	Lecture	T1, T2	R1	V1	20
Training Outcome 1.1.2	Lecture	T1, T2	R2	--	20
Training Outcome 1.1.3	Lecture	T3	R2	V2	20

STUDENT ASSIGNMENTS:

1. _____
2. _____
3. _____

Course Name

**Part D-2
Instructor Notes**

[46 CFR 10.402(b)(6)]

INSTRUCTION ACTIVITY	NOTES	TRAINING AID
1. Introduction		
2. Objectives	<i>Describe the learning objectives for the lesson</i>	
3. Review	<i>Describe prerequisite knowledge/skills for the lesson</i>	
4. Presentation a. Sub-Topic b. Sub-Topic	<i>Describe the information to be presented in the lesson</i>	
5. Student Participation	<i>Describe the scope of the student participation</i>	
6. Practice/Exercises	<i>Describe practice activity and/or exercises</i>	
7. Summary	<i>List/describe key points covered in the lesson</i>	
8. Assessment	<i>Describe how the learning objectives will be assessed</i>	

Course Name

Part E Evaluation

[46 CFR 10.402(b)(7)]

In this section, provide copies of the following:

1. Any methodology that is used to measure a student's knowledge, performance, or level of achievement, including:
 - a. Homework;
 - b. Quizzes;
 - c. Exams;
 - d. Laboratory projects;
 - e. Competency assessments;
 - f. Remediation; and
 - g. Testing strategies.
2. Assessment instruments, which are any tools used to determine whether the student has achieved the desired level of knowledge, understanding, or proficiency.
3. Any methodology that is used to measure the effectiveness of the training or instructor, including:
 - a. Instructor evaluations;
 - b. Course evaluations/surveys; and
 - c. Other feedback.

SCHOOL NAME

Certificate of Training

This will certify that

Student Name (*Mariner Reference No. 456789*)

Has successfully completed

COURSE NAME (*NMC school and course code*)

approved by the United States Coast Guard to meet the training requirements of
[*CFR citation*] and [*STCW citation*]

Date

[*Training Location*]

[*Name*]

[*Title*]

GUIDANCE ON QUALIFIED INSTRUCTORS

1. GENERAL

- a. As defined in 46 CFR 10.107, A Qualified Instructor (QI) is a person who has been trained in instructional techniques and is otherwise qualified to provide required training to candidates for an endorsement to a Merchant Mariner Credential (MMC).
- b. The Coast Guard will only approve QIs as part of its approval of training courses or programs. As part of the training approval, the Coast Guard will identify the QIs approved to teach the course or program. This approval is limited to the specific course or program at the specified school. The Coast Guard will not approve QIs other than as part of the approval of a course or training program.
- c. In addition to relevant professional experience, each QI should have either experience, training, or evidence of instruction in effective instructional and assessment techniques. Previously, this requirement applied only to courses and programs approved to meet STCW requirements. This requirement now applies to all approved courses and training programs. In order to transition to this expanded requirement, instructors who were approved to teach courses or programs prior to March 24, 2014, may continue to teach the specific courses they were approved for at the specified school(s). This transition provision does not apply to approvals to teach new courses or programs, or to teach similar courses or programs at another school.
- d. Evidence of training in “effective instructional techniques” may be in the form of performance evaluations that include an evaluation of effectiveness in on-the-job organization and delivery of training and/or a certificate of successful completion from a “train the trainer” course. A person holding a college degree in education or a related field, or a person holding a state certification as a primary or secondary school teacher will also meet this requirement.

A “train the trainer” course should be based on the International Maritime Organization’s (IMO) model course 6.09, *Training Course for Instructors*, or another Coast Guard accepted syllabus covering the following areas:

- Identification of training needs;
- Learning processes;
- Course design;
- Teaching methods;
- Recognition of individual capacity;
- Identification of performance standards;
- Presentation techniques and use of media;
- Measurement of progress toward training objectives and of adequate performance;
- Favorable and unfavorable conditions for learning;
- Role of incentive and motivation in learning;
- Use of feedback for performance improvement; and
- Course evaluation.

- e. To become a Qualified Instructor, the training organization should submit a request for instructor approval to the National Maritime Center (NMC). The Coast Guard will not accept requests from individual instructors. Requests for approval should be submitted to NMCCourses@uscg.mil or to:

Commanding Officer (NMC-21)
National Maritime Center
100 Forbes Drive
Martinsburg, WV 25404

The Coast Guard encourages training providers to submit requests in electronic format. Paper submission will require additional processing time.

- f. In addition to the requirement for experience and training in effective instruction techniques discussed above, if a simulator is used in a course, the instructor should have practical operational experience on the particular type of simulator being used and receive guidance in instructional techniques involving the use of simulators. Such guidance or instruction should include development of and sequencing of simulated scenarios that have specific learning objectives as found in the International Maritime Organization's (IMO) Train the Simulator Trainer and Assessor Model Course (Model Course 6.09a).
- g. The table that follows provides guidance on the qualifications for approval to serve as an instructor for specific courses. This list is not intended to be all-inclusive. The Coast Guard will also consider other experience, including, but not limited to military experience, that is substantially equivalent to that noted below. When evaluating proposed instructors for courses other than those listed below, the Coast Guard will consider the guidance below when evaluating instructors for courses not listed. For example, a course not listed below that is similar in content and target audience to one listed should have similar instructor qualification standards.
- h. When applicable, consideration will be given to proposed instructors with military experience equivalent to that described in the table.

GUIDANCE ON INSTRUCTOR QUALIFICATIONS

COURSE	INSTRUCTOR QUALIFICATIONS
Basic Search & Rescue (STCW II/1)	Experience Chief Mate, Master, or equivalent military experience on sea-going vessels of at least 200 GRT/500 GT or substantial experience in maritime search and rescue in any other capacity.
Basic Shiphandling (STCW II/1)	Shiphandling experience as Master, First Class Pilot, on vessels of at least 1,600 GRT / 3,000 GT; or equivalent experience as Commanding Officer or Executive Officer on military vessels.
Basic Cargo Handling & Stowage (STCW II/1)	Experience as Master or Chief Mate on cargo-carrying vessels of at least 1,600 GRT / 3,000 GT. Instructors may be limited to teach course lessons applicable to the types of ships they have sailed on.
Basic Meteorology (STCW II/1)	Experience as officer in charge of a navigational watch (OICNW), Chief Mate or Master and have substantial experience in weather forecasting; or college degree or significant college level courses or training in meteorology or atmospheric science and sea-going experience in any capacity.
Basic Stability & Ship Construction (STCW II/1)	Experience as Chief Mate or Master on sea-going vessels of at least 200 GRT / 500 GT.
Basic Watchkeeping (STCW II/1)	Experience as Chief Mate or Master on sea-going vessels of at least 200 GRT / 500 GT.
Celestial Navigation (STCW II/1)	Celestial Navigation experience as OICNW on vessels of at least 200 GRT / 500 GT or equivalent military experience in a navigation rating E-6 or higher.
Electronic Navigation (STCW II/1)	Experience as OICNW on vessels of at least 200 GRT / 500 GT or equivalent military experience in a navigation rating E-6 or higher. using the equipment and systems taught in the course.
Terrestrial Navigation (STCW II/1)	Experience as OICNW on vessels of at least 200 GRT / 500 GT or equivalent military experience in a navigation rating E-6 or higher.
ARPA (STCW A-II/1; A-II/2; A-II/3)	Experience using ARPA as OICNW on vessels of at least 200 GRT / 500 GT. OR, equivalent military experience using ARPA.
Bridge Resource Management (STCW A-II/1; A-II/2; A-II/3)	Experience as Master or substantial experience as Chief Mate managing an augmented bridge team on vessels of at least 200 GRT / 500 GT employing a three watch system. Navy or Coast Guard experience should be as Commanding Officer or Executive Officer.
ECDIS (STCW A-II/1; A-II/2; A-II/3)	Experience using ECDIS as OICNW on vessels of at least 200 GRT / 500 GT or equivalent military experience.
Advanced Shiphandling (STCW A-II/2)	Shiphandling experience as Master, First Class Pilot, on vessels of at least 1,600 GRT / 3,000 GT; or equivalent experience as Commanding Officer or Executive Officer on military vessels.
Advanced Stability (STCW A-II/2)	Experience as Master or Chief Mate on cargo-carrying vessels of at least 1,600 GRT / 3,000 GT.
Advanced Meteorology (STCW A-II/2)	Experience as OICNW, Chief Mate or Master and have substantial experience in weather forecasting; or college degree or significant college level courses or training in meteorology or atmospheric science and sea-going experience in any capacity.
Leadership and Managerial Skills (STCW A-II/2; A-II/3; A-III/2; A-III/3)	Instructors should have one of the following: (1) At least one year of experience as Master on vessels of at least 200 GRT / 500 GT or experience as Commanding Officer on comparable military vessels at a rank of O-4 or greater; or (2) At least one year as Chief Engineer on vessels of at least 3,000 kW / 4,000 HP with a manned engine room; or (3) Experience at the operational or and management level on commercial vessels and a graduate degree in management or a related area.

COURSE	INSTRUCTOR QUALIFICATIONS
Advanced Search & Rescue (STCW A-II/2)	Experience as or equivalent to Chief Mate, Master, or equivalent military on sea-going vessels of at least 200 GRT/500 GT or experience in maritime search and rescue in any other capacity.
Rating Forming Part of a Navigational Watch Program (A-STCW II/4)	At least one year of experience as OICNW on vessels of 200 GRT/500 GT or more or equivalent military experience.
Able Seafarer Program (STCW A-II/5)	At least one year of experience as OICNW on vessels of 200 GRT/500 GT or more or equivalent military experience.
Auxiliary Machinery (STCW A-III/1)	At least one year experience as Chief Engineer or First Assistant Engineer on vessels of at least 3,000 kW / 4,000 HP with a manned engine room.
Control Systems (STCW A-III/1)	At least one year experience as Chief Engineer or First Assistant Engineer on vessels of at least 3,000 kW / 4,000 HP with a manned engine room.
Electrical Machinery and Basic Electronics (STCW A-III/1)	At least one year experience as Chief Engineer, First Assistant Engineer, or the officer in charge of an engine watch on vessels of at least 3,000 kW / 4,000 HP with a manned engine room or equivalent military experience.
Gas Turbine Plants (STCW A-III/1)	At least one year experience as Chief Engineer, First Assistant Engineer, or the officer in charge of an engine watch on gas turbine vessels of at least 3,000 kW / 4,000 HP with a manned engine room or equivalent military experience.
Motor Plants (STCW A-III/1)	At least one year experience as Chief Engineer, First Assistant Engineer, or the officer in charge of an engine watch on motor vessels of at least 3,000 kW / 4,000 HP with a manned engine room or equivalent military experience.
Steam Plants (STCW A-III/1)	At least one year experience as Chief Engineer, First Assistant Engineer, or the officer in charge of an engine watch on steam vessels of at least 3,000 kW / 4,000 HP with a manned engine room or equivalent military experience.
Engine Room Resource Management (STCW A-III/1; A-III/2)	At least one year experience as Chief Engineer or First Assistant Engineer on vessels of at least 3,000 kW / 4,000 HP with a manned engine room or equivalent military experience.
Engineering terminology and shipboard operations (STCW A-III/1)	At least one year experience as Chief Engineer or First Assistant Engineer on vessels of at least 3,000 kW / 4,000 HP with a manned engine room or equivalent military experience.
Management of electrical and electronic control equipment (STCW A-III/2)	At least one year experience as Chief Engineer or First Assistant Engineer on vessels of at least 3,000 kW / 4,000 HP with a manned engine room or equivalent military experience..
Rating Forming Part of an Engineering Watch Program (STCW A-III/4)	At least one year experience as officer in charge of an engineering watch (OICEW) on vessels of at least 3,000 kW / 4,000 HP with a manned engine room or equivalent military experience. Instructors should hold credentials for and have experience in all propulsion modes and/or systems they will instruct.
Able Seafarer-Engine Program (STCW A-III/5)	At least one year experience as OICEW on vessels of at least 3,000 kW / 4,000 HP with a manned engine room or equivalent military experience. Instructors should hold credentials for and have experience in all propulsion modes and/or systems they will instruct or equivalent military experience
Radio Electronics (STCW A-III/6)	Hold or have held an officer endorsement as Chief Engineer or First Assistant Engineer , or hold an STCW endorsement as Electro-Technical Officer, or have other substantial experience and training in the maintenance and repair of radio electronics.

COURSE	INSTRUCTOR QUALIFICATIONS
Integrated Navigation Equipment (STCW A-III/6)	Hold or have held an officer endorsement as Chief Engineer or First Assistant Engineer, or hold an STCW endorsement as Electro-Technical Officer and have experience on vessels equipped with integrated navigation equipment, or have other substantial experience and training in the maintenance and repair of radio electronics
Ship Propulsion & Auxiliary Machinery (STCW A-III/6)	Hold or have held an officer endorsement as Chief Engineer or First Assistant Engineer, or hold an STCW endorsement as Electro-Technical Officer and have experience with the maintenance and repair of shipboard propulsion equipment and auxiliary machinery.
Instrumentation & Control Systems (STCW A-III/6)	Hold or have held an officer endorsement as Chief Engineer or First Assistant Engineer, or hold an STCW endorsement as Electro-Technical Officer, or have other substantial experience and training in the maintenance and repair of shipboard instrumentation and control systems.
High-Voltage Power Systems (STCW A-III/6)	Hold or have held an officer endorsement as Chief Engineer or First Assistant Engineer, or hold an STCW endorsement as Electro-Technical Officer, or have other substantial experience and training in the maintenance and repair of high voltage power systems.
GMDSS (STCW A-IV/2)	Hold STCW endorsement authorizing service on vessels using the GMDSS and have shipboard experience using GMDSS as a Chief Mate, Master, OICNW, or Radio Operator.
Tank Ship Dangerous Liquids (STCW A-V/1-1-2 and A-V/1-1-3)	Experience as person in charge of transfers of dangerous liquid cargo aboard tank ships.
Advanced Oil & Chemical Tanker Operations (STCW A-V/1-1-2 and A-V/1-1-3)	Experience as person in charge of transfers of dangerous liquid cargo aboard tank ships.
Tank Ship Liquefied Gases (STCW A-V/1-2-2)	Experience as person in charge of transfers of liquefied gas cargo aboard tank ships.
Advanced Liquefied Gas Tanker Operations (STCW A-V/1-2-2)	Experience as person in charge of transfers of liquefied gas cargo aboard tank ships.
Tank Ship Familiarization Dangerous Liquids (STCW A-V/1-1-1)	Experience as person in charge of transfers of dangerous liquid cargo aboard tank ships.
Tank Ship Familiarization Liquefied Gases (STCW A-V/1-2-1)	Experience as person in charge of transfers of liquefied gas cargo aboard tank ships.
Tank Barge Dangerous Liquids	Experience as person in charge of transfers of dangerous liquid cargo aboard tank vessels (ships or barges).
Tank Barge Liquefied Gases	Experience as person in charge of transfers of liquefied gas cargo aboard tank vessels (ships or barges).
Crisis Management & Human Behavior (STCW A-V/2)	Experience at the operational or management level on vessels carrying passengers, or substantial numbers of non-maritime personnel under similar operating conditions.
Crowd Management (STCW A-V/2)	Experience at the operational or management level on vessels carrying passengers, or substantial numbers of non-maritime personnel under similar operating conditions.

COURSE	INSTRUCTOR QUALIFICATIONS
Basic Training (STCW A-VI/1)	Instructors should meet the requirements below for each component of BT they will teach.
Personal Survival Techniques (STCW A-VI/1-1)	At least one year of shipboard experience as a deck officer on vessels of at least 200 GRT / 500 GT or other shipboard experience in a capacity with responsibility for operation, testing, and maintenance of survival equipment, conducting of abandon ship drills; and the training of passengers and/or crew in lifesaving equipment and procedures. Equivalent military experience in a deck rating of Boatswain Mate or a Survival or Rescue Swimmer is also acceptable.
Basic Fire Fighting (STCW A-VI/1-2)	At least one year experience as deck or engineering officer on vessels of at least 200 GRT/500 GT; or equivalent military damage control experience, or experience as a professional fire fighter.
First Aid & CPR (STCW A-VI/1-3)	Hold a current certification as a First Aid and/or CPR instructor from nationally recognized medical training organization; or be an EMT, Nurse or Medical Doctor; or have experience as a military Hospital Corpsman.
Personal Safety & Social Responsibilities (STCW A-VI/1-4)	At least two years shipboard experience on vessels of at least 200 GRT / 500 GT.
Proficiency in Survival Craft / Lifeboatman (STCW A-VI/2-1)	Hold endorsements as Lifeboatman and Proficiency in Survival Craft and have experience as deck or engine officer on vessels equipped with lifeboats with designated duties as the person in charge of a lifeboat or equivalent military experience.
Proficiency in Survival Craft-Limited / Lifeboatman-Limited (STCW A-VI/2-1)	Hold endorsements as Lifeboatman or Lifeboatman-Limited and Proficiency in Survival Craft or PSC-Limited and have experience as officer on vessels equipped with lifeboats with designated duties as the person in charge of a survival craft or equivalent military experience.
Fast Rescue Boats (STCW A-VI/2-2)	Experience on vessels of at least 200 GRT / 500 GT with designated duties as the person in charge of fast rescue boat operations; or equivalent military or other fast rescue boat experience.
Advanced Fire Fighting (STCW A-VI/3)	At least one year experience as deck or engineering officer on vessels of at least 200 GRT/500 GT; or equivalent military damage control experience; or experience as a professional fire fighter.
Medical Care Person in Charge (STCW A-VI/4-2)	Experience as a Registered Nurse, Physician Assistant, Nurse Practitioner or Medical Doctor. EMTs may teach lessons within their training and experience.
Medical Care Provider and/or Medical First Aid (STCW A-VI/4-1)	Experience as a Hospital Corpsman, EMT, Registered Nurse, Physician Assistant, Nurse Practitioner or Medical Doctor.
Security Awareness (STCW A-VI/6-1)	Experience as a Vessel Security Officer or as a maritime security professional or equivalent military experience.
Vessel Personnel with Specific Security Duties (STCW A-VI/6-2)	Experience as a Vessel Security Officer or as a maritime security professional or equivalent military experience.
Simulator Instructor (STCW A-I/6)	Experience in designing and presenting instruction using simulators.
Able Seaman Program	At least one year of experience as the officer in charge of the navigational watch on vessels of 200 GRT/500 GT or more or equivalent military experience.
Apprentice Pilot Program	Experience as a 1st Class Pilot on appropriate waters and route.
Fishing Vessel Drill Instructor	Hold an endorsement as Mate or Master on vessels of at least 200 GRT / 500 GT or substantial marine safety and/or fishing vessel experience.
Stability & Ballast Control (MODU)	Experience as Master, Offshore Installation Manager (OIM), Barge Supervisor (BS), or Ballast control Operator (BCO) aboard MODUs.

COURSE	INSTRUCTOR QUALIFICATIONS
High Speed Craft Type Rating	Experience as Master or Chief Engineer (for engineering lessons) on high speed craft.
Designated Duty Engineer 4,000 HP	At least two years experience as a chief engineer on motor vessels of at least 1000 HP or equivalent military experience. Consideration should also be given to military ratings of Engineman, Machinery Technician, or Watercraft Engineer with at least two years of shipboard experience as a qualified engineering watch supervisor or engineering officer.
Designated Duty Engineer Unlimited HP	At least three years experience as a chief engineer on motor vessels of at least 4000 HP or equivalent military experience. Consideration should also be given to military ratings of Engineman, Machinery Technician, or Watercraft Engineer with at least three years of shipboard experience as a qualified engineering watch supervisor or engineering officer.
Diesel Endorsement/Cross-Over	Hold an officer endorsement as First Assistant Engineer or Chief Engineer valid for motor vessels and have at least three years experience as OICEW, First Assistant, and/or Chief Engineer on motor vessels or equivalent military experience.
Diesel Engineering	At least three years experience as First Assistant, and/or Chief Engineer on motor vessels or equivalent military experience.
Gas Turbine Endorsement/Cross-Over	At least three years experience as OICEW, First Assistant, and/or Chief Engineer on gas turbine vessels or equivalent military experience.
Gas Turbine Engineering	At least three years experience as First Assistant, and/or Chief Engineer on gas turbine vessels or equivalent military experience.
Radar Observer (Unlimited)	Hold or have held an officer endorsement for near coastal or oceans and have at least one year experience using radar as the OICNW on vessels of at least 200 GRT / 500 GT or equivalent military experience.
Radar Observer (Inland)	Hold or have held an officer endorsement for inland, near coastal or oceans and have at least one year experience using radar as the OICNW on vessels of at least 200 GRT / 500 GT or equivalent military experience.
Radar Observer (Rivers)	Have at least one year experience using radar as the OICNW on vessels of at least 200 GRT / 500 GT or equivalent military experience.
Radar Observer Renewal/Refresher	Instructor should meet the same requirements for the applicable original radar observer course.
Rules of the Road (exam)	Hold or have held an officer endorsement as mate or master endorsed for the appropriate route and have experience as OICNW. Equivalent military experience is also acceptable.
Stability and Ballast Control	At least one year experience as Ballast Control Operator, Barge Supervisor, or Offshore Installation Manager.
Steam Endorsement/Cross-Over	At least three years experience as OICEW, First Assistant, and/or Chief Engineer on steam vessels or equivalent military experience.
Steam Engineering	At least three years experience as First Assistant, and/or Chief Engineer on steam vessels or equivalent military experience.
Tank Barge Fire Fighting	At least one year experience as deck or engineering officer on vessels of at least 200 GRT/500 GT; or equivalent military damage control experience, or experience as a professional fire fighter.

COURSE	INSTRUCTOR QUALIFICATIONS
Visual Communications (Flashing Light)	Hold or have held a deck officer endorsement for any gross tons or an STCW endorsement as OICNW, Chief Mate, or Master for 500 GT or more or have substantial experience sending and receiving information by Morse code.
Able Seaman (Exam)	At least one year of experience as the officer in charge of the navigational watch on vessels of 200 GRT/500 GT or more or two years experience as an Able Seaman on vessels of 200 GRT/500 GT or more; or have equivalent military service in the deck rating of Boatswain Mate.
Apprentice Mate (Steersman) (Exam)	At least three years experience as Master on towing vessels on the routes for which the course is approved.
Assistance Towing (Exam)	Hold a commercial assistance towing endorsement or an officer endorsement authorizing assistance towing service, or have equivalent towing experience.
Auxiliary Sail (Exam)	Experience as Mate or Master on sail vessels or substantial sailing experience.
Celestial Navigation 500/1600 GRT (Exam)	Celestial Navigation experience as officer in charge of a navigational watch on sea-going vessels of at least 200 GRT / 500 GT.
Celestial Navigation 200 GRT (Exam)	Celestial Navigation experience as OICNW on vessels of at least 100 GRT.
Deck & Navigation General (Exam)	Experience as or equivalent to Master on sea-going vessels of at least 200 GRT/500 GT or as Chief Mate or Master on vessels over 1,600 GRT/3,000 GT.
Fireman, Oiler, Watertender, QMED (Exam)	At least three years experience in the engine room of steam ships AND motor vessels of at least 1600 GRT/3000 ITC as a QMED-Fireman/Watertender AND QMED-Oiler OR as QMED-Junior Engineer, or year experience as an officer in charge of the engineering watch for each propulsion mode, steam and motor. Consideration should be given to military ratings of Machinist's Mate, Boiler Tender, Engineman or Machinery Technician with at least three years shipboard experience on steamships and motor vessels. Consideration should also be given for equivalent shore side knowledge, experience, and credentials such as stationary steam power plant applications operational experience. Instructors only qualified in one propulsion mode may be approved for modules for that mode only.
Officer Endorsement Renewal (Exam)	Experience as mate or master appropriate to the tonnage(s) the course is approved for or equivalent military experience.
Limited Master (Exam)	Experience as Master on vessels of at least 25 GRT or equivalent military experience.
Limited or Restricted OUPV (Exam)	Experience as a licensed Master or operator of uninspected passenger vessels or equivalent military experience.
Master 100 Less Than Tons (Exam)	Experience as Master on vessels of at least 25 GRT or equivalent military experience.
Master 200 Less Than Tons (Exam)	Experience as Master on vessels of at least 100 GRT or equivalent military experience.
Mobile Offshore Drilling Units (Exam)	Experience as Offshore Installation Manager
OUPV (Exam)	Officer endorsement as or experience equivalent to OUPV Near Coastal or greater.

COURSE CURRICULA GUIDELINES

The following table lists general criteria for the content and duration of courses submitted for Coast Guard approval. This is not an inclusive list of all courses that may be approved. Also included are relevant portions of the language and STCW and regulatory citations that will be included in the approval granted to the course.

Courses must include written examinations appropriate to the course material and the knowledge requirements of the position or endorsement for which the student is being trained. For a course approved to substitute for a Coast Guard-administered examination, the courses must be of such a degree of difficulty that a student who successfully completes them would most likely pass, on the first attempt, an examination prepared by the Coast Guard (46 CFR 10.403(a)(4)).

In addition, as specified in 46 CFR 10.403(a)(5), students must successfully demonstrate practical skills appropriate for the course material and equal to the level of endorsement for which the course is approved.

Courses may be approved to meet more than one requirement. For example, a single course may be designed and approved to meet the examination requirements for a national endorsement as Lifeboatman and to meet the competency standards for an STCW endorsement for Proficiency in Survival Craft. In such cases, the course should incorporate the guidance below applicable for each component of the course.

To avoid confusion, the Coast Guard encourages schools to use the standard course names from the table below for their courses and may need to modify the course name.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Able Seafarer-Deck Program	The program should include not less than 12 months of seagoing service in the deck department and practical assessments to ensure that the student has successfully achieved the level of competency and knowledge, understanding and proficiency specified in Table A-II/5 of the STCW Code. Mariners must have qualified for an RFPNW endorsement without restriction to lookout duties only prior to start of the program [46 CFR 12.603(a)(3)].	Program will satisfy the following requirements for an endorsement as Able Seafarer-Deck: 1. the requirements of STCW Code Section A-II/5; 2. the training and service requirements of 46 CFR 12.603(a)(3)(ii); and 3. the competency requirements of 46 CFR 12.603(a)(4). Mariners must provide evidence of their qualifying sea service.
Able Seafarer-Engine Program	The program should include not less than 6 months of seagoing service in the engine department and practical assessments to ensure that the student has successfully achieved the level of competency and knowledge, understanding and proficiency specified in Table A-III/5 of the STCW Code. Mariners must have qualified for an RFPEW endorsement prior to start of the program.	Program will satisfy the following requirements for an endorsement as Able Seafarer-Engine: 1. the requirements of STCW Code Section A-III/5; 2. the training and service requirements of 46 CFR 12.607(a)(3)(ii); and 3. the competency requirements of 46 CFR 12.607(a)(4). Mariners must provide evidence of their qualifying sea service.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Able Seaman (in lieu of Coast Guard examination)	Courses should be at least 40 hours and cover all of the topics on Coast Guard professional examination for Able Seaman endorsements.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements of 46 CFR 12.401(c)(5) for any national rating endorsement as Able Seaman.
Advanced Fire Fighting	The course should be at least 32 hours in duration and be substantially similar to IMO Model Course 2.03, <i>Advanced Training in Fire Fighting</i> . Course should include assessments of competency from national assessment guidelines, or an equivalent alternative.	A mariner who successfully completes the course will satisfy the <i>Advanced Fire Fighting</i> training requirements of STCW Code Section A-VI/3 and 46 CFR 11.201(h), and 11.303(a).
Advanced Fire Fighting Revalidation	The course should be at least 8 hours and include assessments of competencies identified in 46 CFR 11.303(c).	A mariner who successfully completes the course will satisfy the <i>Advanced Fire Fighting</i> training revalidation requirements of STCW Code Section A-VI/3 and 46 CFR 11.201(h)(1), and 11.303(d), provided that the mariner has at least 1 year of sea service within the last 5 years.
Advanced Fire Fighting Refresher	The course should be at least 12 hours and include assessments of all competencies in STCW Code Table A-VI/3.	A mariner who successfully completes the course will satisfy the <i>Advanced Fire Fighting</i> training revalidation requirements of STCW Code Section A-VI/3 and 46 CFR 11.201(h)(1), and 11.303(e).
Advanced Meteorology	<p>The course should be at least 35 hours and cover all topics in applicable module of IMO Model Course 7.01, <i>Master and Chief Mate with particular emphasis on the following topics:</i></p> <ol style="list-style-type: none"> 1. Characteristics of weather systems including tropical revolving storms; 2. Advanced meteorological concepts, including synoptic charts and weather forecasting, and voyage planning with respect to weather conditions and wave height; 3. Use of technology to transmit and receive weather forecasts (such as navigational telex or weather-routing providers); and 4. Ship-routing services (capabilities and limitations). 	A mariner who successfully completes the course will satisfy the <i>Advanced Meteorology</i> training requirements of 46 CFR 11.305(a)(3)(iii) and 11.307(a)(3)(iii) for STCW endorsements as Master or Chief Mate on vessels of 3,000 GT or more and 46 CFR 11.311(a)(3)(iii) and 11.313(a)(3)(iii) for STCW endorsements as Master or Chief Mate or Master on vessels of more than 500 GT and less than 3,000 GT.
Advanced Shiphandling (3,000 GT or More)	The course should be at least 70 hours and cover all topics in applicable module of IMO Model Course 7.01, Master and Chief Mate. Lessons and exercises should be appropriate to vessels of 1,600 GRT/3,000 GT or more. The training should also include simulation of ship maneuvering in heavy weather, and launching of lifeboats and liferafts in heavy weather.	A mariner who successfully completes the course will satisfy the <i>Advanced Shiphandling</i> training requirements of 46 CFR 11.305(a)(3)(i) and 11.307(a)(3)(i) for STCW endorsements as Chief Mate or Master on vessels of 3,000 GT or more and 46 CFR 11.311(a)(3)(i) and 11.313(a)(3)(i) for STCW endorsements as Master or Chief Mate on vessels of more than 500 GT and less than 3,000 GT.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Advanced Shiphandling (500 GT to 3,000 GT)	The course should be at least 70 hours and cover all topics in applicable module of IMO Model Course 7.01, <i>Master and Chief Mate</i> . Lessons and exercises should be appropriate to vessels between 200 GRT/500 GT and 1,600 GRT/3,000 GT. The training should also include simulation of ship maneuvering in heavy weather, and launching of lifeboats and liferafts in heavy weather.	A mariner who successfully completes the course will satisfy the <i>Advanced Shiphandling</i> training requirements of 46 CFR 11.311(a)(3)(i) and 11.313(a)(3)(i) for STCW endorsements as Master or Chief Mate on vessels of more than 500 GT and less than 3,000 GT.
Advanced Stability (3,000 GT or More)	The course should be at least 35 hours and cover all topics in applicable module of IMO Model Course 7.01, <i>Master and Chief Mate</i> . Lessons and exercises should be appropriate to vessels of 1,600 GRT/3,000 GT or more.	A mariner who successfully completes the course will satisfy the <i>Advanced Stability</i> training requirements of 46 CFR 11.305(a)(3)(ii) and 11.307(a)(3)(ii) for STCW endorsements as Chief Mate or Master on vessels of 3,000 GT or more and 46 CFR 11.311(a)(3)(ii) and 11.313(a)(3)(ii) for STCW endorsements as Master or Chief Mate on vessels of more than 500 GT and less than 3,000 GT.
Advanced Stability (500 GT to 3,000 GT)	The course should be at least 35 hours and cover all topics in applicable module of IMO Model Course 7.01, <i>Master and Chief Mate</i> . Lessons and exercises should be appropriate to vessels between 200 GRT/500 GT and 1,600 GRT/3,000 GT.	A mariner who successfully completes the course will satisfy the <i>Advanced Stability</i> training requirements of 46 CFR 11.311(a)(3)(ii) and 11.313(a)(3)(ii) for STCW endorsements as Chief Mate or Master on vessels of more than 500 GT and less than 3,000 GT.
Apprentice Mate (Steersman) (in lieu of Coast Guard examination)	The course should be at least 90 hours and cover all topics on Coast Guard professional examination for Apprentice Mate (Steersman) for the applicable route.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements for any national officer endorsement as Apprentice Mate (Steersman) for the applicable route.
ARPA	The course should be at least 35 hours and cover all topics in the ARPA modules of IMO Model Courses 1.07 and 1.08. Course should include applicable assessments of competence for STCW endorsements as Officer in Charge of a Navigational Watch (OICNW), Chief Mate, and Master.	A mariner who successfully completes the course will satisfy the <i>ARPA</i> training requirements of 46 CFR 11.305(a)(3)(vi); 46 CFR 11.307(a)(3)(vi); 46 CFR 11.309(a)(4)(xiv); 46 CFR 11.311(a)(3)(viii); 46 CFR 11.313(a)(3)(viii); 46 CFR 11.315(a)(3)(v); 46 CFR 11.317(a)(3)(vii); 46 CFR 11.319(a)(4)(viii); and 46 CFR 11.321(a)(3)(vii). Approval should also reference specific tasks from national assessment guidelines performed in the course.
Assistance Towing (in lieu of Coast Guard examination)	The course should be at least 4 hours and cover all topics on a Coast Guard exam module for an Assistance Towing endorsement.	A mariner who successfully completes the course within 1 year of application will satisfy the requirements of 46 CFR 11.482(b) to add an Assistance Towing endorsement to any national officer endorsement as Operator of Uninspected Passenger Vessels (OUPV) or Mate or Master on vessels of less than 200 GRT.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Auxiliary Machinery	The course should be at least 120 hours and cover all topics in applicable module of IMO Model Course 7.04, <i>Officer in Charge of an Engineering Watch</i>	A mariner who successfully completes the course will satisfy the <i>Auxiliary Machinery</i> training requirements of 46 CFR 11.329(a)(4)(vi) for STCW endorsements as OICEW on vessels on vessels powered by main propulsion machinery of 750 kW / 1,000 HP propulsion power or more.
Auxiliary Sail (in lieu of Coast Guard Examination)	The course should be at least 4 hours and cover all topics on Coast Guard exam module for an Auxiliary Sail endorsement.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements to add an Auxiliary Sail endorsement to any national officer endorsement as Operator of Uninspected Passenger Vessels (OUPV) or Mate or Master GRT.
Basic Fire Fighting	The course should be at least 16 hours and be substantially similar to IMO Model Course 1.20, <i>Fire Prevention and Fire Fighting</i> . The course should include assessments of competence for STCW Code Table A-VI/1-2.	A mariner who successfully completes the course will satisfy the following requirements: <ol style="list-style-type: none"> 1. Fire Prevention and Fire Fighting per STCW Code Section A-VI/1; 2. Fire Prevention and Fire Fighting per 46 CFR 11.302(a)(2) and 46 CFR 12.602(a)(2); 3. Basic Fire Fighting per 46 CFR 11.201(h)(2) [Basic only] and 46 CFR 11.201(h)(3); and 4. the firefighting requirements for a national tankerman endorsement in 46 CFR 13.201(c)(3), 13.301(c)(3); 13.401(d); and 13.501(c)(3).
Basic Fire Fighting Revalidation	The course should be at least 4 hours and include practical exercises and assessments of competence for those areas identified in 46 CFR 11.302(d)(2) and 46 CFR 12.602(d)(2).	A mariner who successfully completes the course will satisfy the continued competency requirements for Fire Prevention and Fire Fighting in STCW Section A-VI/1, 46 CFR 11.302(d)(2), and 46 CFR 12.602(d)(2), <u>provided</u> that they have at least 1 year of sea service in the last 5 years.
Basic Fire Fighting Refresher	The course should be at least 8 hours and provide refresher training and assessments relative to all competencies and KUPs in STCW Code Table A-VI/1-2. <u>NOTE</u> : When Basic Training Refresher is given as a separate course for each BT element, mariners must complete courses for all elements to show continued competency.	A mariner who successfully completes the course will satisfy the continued competency requirements for STCW Basic Training limited to Fire Prevention and Fire Fighting in STCW Section A-VI/1, 46 CFR 11.302(e), and 46 CFR 12.602(e). Mariners must also provide evidence of continued competency in the other areas of Basic Training.
Basic Cargo Handling & Stowage	The course should be at least 35 hours and cover all topics in applicable module of IMO Model Course 7.03, <i>Officer in Charge of a Navigational Watch</i> . The course should also include lesson on bulk ships and substantial lessons on container and Ro-Ro ships.	A mariner who successfully completes the course will satisfy the <i>Cargo Handling and Stowage</i> training requirements of 46 CFR 11.309(a)(4)(x) for STCW endorsements as OICNW on vessels of 500 GT or more.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Basic Meteorology	<p>The course should be at least 35 hours and cover all topics in applicable module of IMO Model Course 7.03, <i>Officer in Charge of a Navigational Watch</i>, with particular emphasis on the following topics:</p> <ol style="list-style-type: none"> 1. Characteristics of weather systems; 2. Weather charting and reporting; 3. Importance of sending weather observations; 4. Sources of weather information; and 5. Interpreting weather forecast products. 	A mariner who successfully completes the course will satisfy the <i>Meteorology</i> training requirements of 46 CFR 11.309(a)(4)(xiii) for STCW endorsements as OICNW on vessels of 500 GT or more.
Basic Shiphandling	<p>The course should be at least 35 hours and cover all topics in applicable module of IMO Model Course 7.03, <i>Officer in Charge of a Navigational Watch</i>.</p>	A mariner who successfully completes the course will satisfy the <i>Ship Handling</i> training requirements of 46 CFR 11.309(a)(4)(xi) for STCW endorsements as OICNW on vessels of 500 GT or more.
Basic Training	<p>The course should be at least 40 hours and be substantially similar to IMO Model Courses 1.13, 1.19, 1.20, and 1.21. Course should include assessments of competence for STCW Code Tables A-VI/1-1 through A-VI/1-4. <u>NOTE</u>: Course may be either a single course in all four elements of BT, or all individual courses for each element of BT. If the latter, schools must follow their approved curricula and cannot waive portions of course if a mariner has taken courses for one or more parts of BT, but not all. [46 CFR 10.402(g)(1)(iii) and (h)(2)(ii)]</p>	<p>A mariner who successfully completes the course will satisfy the following requirements:</p> <ol style="list-style-type: none"> 1. Basic Training per STCW Code Section A-VI/1; 2. Basic Training per 46 CFR 11.302(a) and 46 CFR 12.602(a); 3. Basic Fire Fighting per 46 CFR 11.201(h)(2)[Basic only] and 46 CFR 11.201(h)(3); 4. the firefighting requirements for a national tankerman endorsement in 46 CFR 13.201(c)(3), 13.301(c)(3); 13.401(d); and 13.501(c)(3); and 5. the first aid and CPR training requirements of 46 CFR 11.201(i)(1).
Basic Training Revalidation	<p>The course should be at least 8 hours and include practical exercises and assessments of competence for all areas identified in 46 CFR 11.302(d) (1) and (2) and 46 CFR 12.602(d). <u>NOTE</u>: The course duration refers to training and assessment time and does not include time to travel to/from firefighting and in-water training facilities and for issuance of student gear.</p>	A mariner who successfully completes the course will satisfy the continued competency requirements for Personal Survival Techniques and Fire Prevention and Fire Fighting in STCW Section A-VI/1, 46 CFR 11.302(d) and 46 CFR 12.602(d), <u>provided</u> that they have at least 1 year of sea service in the last 5 years.
Basic Training Refresher	<p>The course should be at least 16 hours and provide refresher training and assessments relative to all competencies and KUPs in STCW Code Tables A-VI/1-1 and A-VI/1-2.</p>	A mariner who successfully completes the course will satisfy the continued competency requirements for STCW Basic Training in STCW Section A-VI/1, 46 CFR 11.302(e) and 46 CFR 12.602(e).

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Bridge Resource Management	The course should be at least 21 hours and provide training on relevant competencies and KUPs for BRM in STCW Code Table A-II/1. The course should include promoting a cohesive team environment; developing and improving the decision-making process and navigational and storm-avoidance scenarios.	A mariner who successfully completes the course will satisfy the <i>Bridge Resource Management Requirements</i> in 46 CFR 11.309(a)(4)(vii); 11.319(a)(4)(vii); and 11.321(a)(3)(iv).
Oceans Navigation / Celestial Navigation 500/1600 GRT (in lieu of Coast Guard examination)	The course should be at least 80 hours and provide training in all subjects on the Coast Guard examination for increasing the scope of an endorsement for Mate or Master 500/1600 GRT from near coastal to oceans. <u>NOTE</u> : This course may be combined with one that covers the navigation general subjects for Mate 500/1600, or the deck general and navigation general subjects for Master 500/1600 GRT. This course is for increasing the scope of a near coastal endorsement, it may not be for the original issuance of an oceans endorsement.	A mariner who successfully completes the course within 1 year of application will satisfy the oceans navigation professional examination requirements for increasing the scope of endorsements as Mate or Master of self-propelled vessels of less than 500 or 1600 GRT from near coastal to oceans. <u>NOTE</u> : The following optional provisions will be included as appropriate: Deck General for Mate 500/1600 GRT and/or Navigation General and Deck General for Master 500/1600 GRT.
Oceans Navigation / Celestial Navigation 500/1600 GRT (in lieu of Coast Guard examination)	The course should be at least 80 hours and provide training in all subjects on the Coast Guard examination for increasing the scope of an endorsement for Mate or Master 500/1600 GRT from near coastal to oceans. <u>NOTE</u> : This course may be combined with one that covers the navigation general subjects for Mate 500/1600, or the deck general and navigation general subjects for Master 500/1600 GRT. This course is for increasing the scope of a near coastal endorsement, it may not be for the original issuance of an oceans endorsement.	A mariner who successfully completes the course within 1 year of application will satisfy the oceans navigation professional examination requirements for increasing the scope of endorsements as Mate or Master of self-propelled vessels of less than 500 or 1600 GRT from near coastal to oceans. <u>NOTE</u> : The following optional provisions will be included as appropriate: Deck General for Mate 500/1600 GRT and/or Navigation General and Deck General for Master 500/1600 GRT.
Oceans Navigation / Celestial Navigation 200 GRT (in lieu of Coast Guard examination)	The course should be at least 40 hours and provide training in all subjects on Coast Guard exam modules for increasing the scope of an endorsement as Mate or Master 200 GRT from near coastal to oceans.. This course is for increasing the scope of a near coastal endorsement, it may not be for the original issuance of an oceans endorsement.	A mariner who successfully completes the course within 1 year of application will satisfy the Oceans Navigation professional examination requirements for increasing the scope of endorsements as Mate or Master of self-propelled vessels of less than 200 GRT from near coastal to oceans.
Celestial Navigation (Operational Level)	The course should be at least 80 hours and cover all topics in applicable module of IMO Model Course 7.03, <i>Officer in Charge of a Navigational Watch</i> . <u>NOTE</u> : Courses to meet this requirement may be either a single comprehensive course for terrestrial navigation, celestial navigation, and electronic navigation systems, or separate courses for each component.	A mariner who successfully completes the course will satisfy the <i>Celestial Navigation</i> training requirements of 46 CFR 11.309(a)(4)(viii) for STCW endorsements as OICNW on vessels of 500 GT or more.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Combined Basic and Advanced Fire Fighting	The course should be at least 40 hours and cover all subjects and assessments noted for individual courses for basic and advanced fire fighting. Courses may be shorter than the sum of the recommended hours for the separate courses based on material common to both.	A mariner who successfully completes the course will satisfy the following requirements: <ol style="list-style-type: none"> 1. Fire Prevention and Fire Fighting per STCW Code Section A-VI/1; 2. Advanced Fire Fighting per STCW Code Section A-VI/3; 3. Fire Prevention and Fire Fighting per 46 CFR 11.302(a)(2) and 46 CFR 12.602(a)(2); 4. Basic and Advanced Fire Fighting per 46 CFR 11.201(h)(2) and 46 CFR 11.201(h)(3); 5. Advanced Fire Fighting per 46 CFR 11.303(a); and 6. Firefighting requirements for a national tankerman endorsement in 46 CFR 13.201(c)(3), 13.301(c)(3); 13.401(d); and 13.501(c)(3).
Computer Systems and Maintenance	The course should be at least 120 hours and cover all applicable competencies and KUPs in STCW Code Table A-III/7.	A mariner who successfully completes the course will satisfy the <i>Computer Systems and Maintenance</i> training requirements in 46 CFR 12.611(a)(4)(i) for an STCW endorsement as Electro-Technical Rating on vessels powered by main propulsion machinery of 750 kW/1,000 HP or more.
Control Systems	The course should be at least 160 hours and cover all topics in applicable module of IMO Model Course 7.04, <i>Officer in Charge of an Engineering Watch</i> .	A mariner who successfully completes the course will satisfy the <i>Control Systems</i> training requirements of 46 CFR 11.329(a)(4)(xi) for STCW endorsements as OICEW on vessels powered by main propulsion machinery of 750 kW / 1,000 HP propulsion power or more.
CPR (w/o First Aid)	The course should be at least 4 hours and include live practical exercises and assessments involving the performance of CPR.	A mariner who successfully completes the course will satisfy the CPR training requirements of 46 CFR 11.201(i)(2)(iii).
Crisis Management and Human Behavior	The course should be at least 8 to 14 hours and cover all topics in IMO Model Course 1.29, <i>Proficiency in Crisis Management and Human Behaviour Training Including Passenger Safety, Cargo Safety and Hull Integrity Training</i> . NOTE: Courses may be applicable to all personnel, or tailored to a specific level (i.e., Support, Operational, and/or Management).	A mariner who successfully completes the course will satisfy the <i>Crowd Management and Passenger Safety, Cargo Safety and Hull Integrity</i> training requirements of STCW Code Section A-V/2 and Table A-V/2 <i><include any limitations to a specific level></i> .
Crowd Management	The course should be at least 4 to 7 hours and cover all topics in IMO Model Course 1.28, <i>Crowd Management, Passenger Safety and Safety Training for Personnel Providing Direct Services to Passengers in Passenger Spaces</i> . NOTE: Courses may be applicable to all personnel, or tailored to a specific level (i.e., Support, Operational, and/or Management).	A mariner who successfully completes the course will satisfy the <i>Crowd Management</i> training requirements of STCW Code Section A-V/2 <i><include any limitations to a specific level></i> .

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Designated Duty Engineer 4,000 HP (in lieu of Coast Guard examination)	The course should be at least 140 hours and cover all topics on Coast Guard exam modules for an endorsement as Designated Duty Engineer of Motor-Propelled Vessels of Less Than 4,000 HP/3,000 kW (DDE 4,000 HP Motor).	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements for a national officer endorsement as Designated Duty Engineer Less Than 4,000 HP Motor.
Designated Duty Engineer Unlimited HP (in lieu of Coast Guard examination)	The course should be at least 160 hours and cover all topics on Coast Guard exam modules for an endorsement as Designated Duty Engineer of Motor-Propelled Vessels of Unlimited Propulsion Power (DDE Unlimited Motor).	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements for national officer endorsements as Designated Duty Engineer Unlimited HP Motor.
Diesel Endorsement	The course should be at least 140 hours and include theory, types, construction, ancillary systems, maintenance, and repair of main propulsion diesel engines.	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 11.502(b)(4) to add an endorsement for motor propulsion to a national engineer officer endorsement valid for steam and/or gas turbine propulsion.
Electrical Machinery and Basic Electronics	The course should be at least 140 hours and cover all topics in applicable module of IMO Model Course 7.04, <i>Officer in Charge of an Engineering Watch</i>	A mariner who successfully completes the course will satisfy the <i>Electrical Machinery and Basic Electronics</i> training requirements of 46 CFR 11.329(a)(4)(x) for STCW endorsements as OICEW on vessels on vessels powered by main propulsion machinery of 750 kW / 1,000 HP propulsion power or more.
Electronic Chart Display and Information Systems (ECDIS)	The course should be at least 35 hours and be substantially similar IMO Model Course 1.27, <i>Operational Use of Electronic Chart Display and Information Systems (ECDIS)</i> (2012 Edition). Course should include applicable assessments of competence for STCW endorsements as Officer in Charge of a Navigational Watch (OICNW), Chief Mate, and Master.	A mariner who successfully completes the course will satisfy the <i>ECDIS</i> training requirements of 46 CFR 11.305(a)(3)(vii) and (b)(2); 46 CFR 11.307(a)(3)(vii) and (b)(2); 46 CFR 11.309(a)(4)(xvi) and (c)(2); 46 CFR 11.311(a)(3)(vii) and (b)(2); 46 CFR 11.313(a)(3)(vii) and (b)(2); 46 CFR 11.315(a)(3)(iv) and (b)(2); 46 CFR 11.317(a)(3)(v) and (b)(2); 46 CFR 11.319(a)(4)(x) and (b)(2); and 46 CFR 11.321(a)(3)(v) and (b)(2). Approval should also reference specific tasks from national assessment guidelines performed in the course.
Electronic Navigation (Operational Level)	The course should be at least 35 hours and cover all topics in applicable module of IMO Model Course 7.03, <i>Officer in Charge of a Navigational Watch</i> . NOTE: Courses to meet this requirement may be either a single comprehensive course for terrestrial navigation, celestial navigation, and electronic navigation systems, or separate courses for each component. Students in this course should have completed a Radar Observer course prior to starting this course.	A mariner who successfully completes the course will satisfy the <i>Electronic Navigation Systems</i> training requirements of 46 CFR 11.309(a)(4)(viii) for STCW endorsements as OICNW on vessels of 500 GT or more.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Engine Room Resource Management	The course should be at least 35 hours and include sufficient training and written and practical assessments to ensure that the student has successfully achieved the level of competency and knowledge, understanding, and proficiency specified in Table A-III/1 of the STCW Code.	A mariner who successfully completes the course will satisfy the <i>Engine Room Resource Management</i> training requirements in 46 CFR 11.325(a)(3)(i) and (b)(1); 46 CFR 11.327(a)(3)(i) and (b)(1); 46 CFR 11.329(a)(4)(iv); 46 CFR 11.331(a)(3)(i) and (b)(1); and 46 CFR 11.333(a)(3)(i) and (b)(1).
Engineering Terminology and Shipboard Operations	The course should be at least 35 hours and cover all topics in applicable module of IMO Model Course 7.04, <i>Officer in Charge of an Engineering Watch</i> .	A mariner who successfully completes the course will satisfy the <i>Engineering Terminology and Shipboard Operations</i> training requirements of 46 CFR 11.329(a)(4)(v) for STCW endorsements as OICEW on vessels on vessels powered by main propulsion machinery of 750 kW/1,000 HP propulsion power or more.
Fast Rescue Boat	The course should be at least 24 hours and be substantially similar to IMO Model Course 1.24, <i>Proficiency in Fast Rescue Boats</i> . Course should include appropriate assessments of competence for STCW Code Table A-VI/2-2.	A mariner who successfully completes will satisfy the training requirements of 46 CFR 12.617(a)(3) and STCW Code Section A-VI/2 and the competency demonstration requirements of 46 CFR 12.617(a)(4) and STCW Code Table A-VI/2-2 for an STCW endorsement for Proficiency in Fast Rescue Boats.
First Aid (w/o CPR)	The course should be at least 4 hours and be substantially similar to the American National Red Cross Standard First Aid course or American National Red Cross Community First Aid & Safety course.	A mariner who successfully completes the course will satisfy the first aid training requirements of 46 CFR 11.201(i)(1)(ii).
First Aid & CPR	The course should be at least 8 hours and be substantially similar to IMO Model Course 1.13. The course should include appropriate assessments of competence for STCW Code Table A-VI/1-3.	A mariner who successfully completes the course will satisfy the following requirements: <ol style="list-style-type: none"> 1. Elementary First Aid per STCW Code Table A-VI/1-3; 2. Elementary First Aid per 46 CFR 11.302(a)(3) and 46 CFR 12.602(a)(3); and 3. the first aid and CPR training requirements of 46 CFR 11.201(i)(1).
Gas Turbine Endorsement	The course should be at least 80 hours and include theory, types, construction, ancillary systems, inspection, maintenance, troubleshooting and repair of main propulsion gas turbine engines.	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 11.502(b)(4) to add an endorsement for gas turbine propulsion to a national engineer officer endorsement valid for steam and/or motor propulsion.
Gas Turbine Plants	The course should be at least 120 hours and cover all topics in applicable module of IMO Model Course 7.04, <i>Officer in Charge of an Engineering Watch</i> .	A mariner who successfully completes the course will satisfy the <i>Gas Turbine Plants</i> training requirements of 46 CFR 11.329(a)(4)(vii) for STCW endorsements as OICEW on vessels on vessels powered by main propulsion machinery of 750 kW / 1,000 HP propulsion power or more.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
GMDSS	The course should be at least 70 hours and be substantially similar to the U.S. Model GMDSS course.	A mariner who successfully completes the course will satisfy the <i>GMDSS</i> training requirements of 46 CFR 11.305(a)(3)(viii); 46 CFR 11.307(a)(3)(viii); 46 CFR 11.309(a)(4)(xv); 46 CFR 11.311(a)(3)(ix); 46 CFR 11.313(a)(3)(ix); 46 CFR 11.315(a)(3)(vi); and 46 CFR 11.319(a)(4)(ix).
GMDSS (Restricted Operator)	The course should be at least 21 hours and be substantially similar to the U.S. Model GMDSS Restricted Operator course.	A mariner who successfully completes the course will satisfy the <i>GMDSS</i> training requirements of 46 CFR 11.305(a)(3)(viii); 46 CFR 11.307(a)(3)(viii); 46 CFR 11.309(a)(4)(xv); 46 CFR 11.311(a)(3)(ix); 46 CFR 11.313(a)(3)(ix); 46 CFR 11.315(a)(3)(vi); and 46 CFR 11.319(a)(4)(ix). NOTE: The mariner's GMDSS endorsement will be limited to vessels operating exclusively in GMDSS A1 sea areas.
High-Voltage Power Systems (Operational Level)	The course should be at least 35 hours and cover all applicable competencies and KUPs in STCW Code Table A-III/6.	A mariner who successfully completes the course will satisfy the <i>High-Voltage Power Systems</i> training requirements of 46 CFR 11.335(a)(4)(vi) for STCW endorsements as electro-technical officer on vessels powered by main propulsion machinery of 750 kW/1,000 HP or more.
High-Voltage Power Systems (Support Level)	The course should be at least 35 hours and cover all applicable competencies and KUPs in STCW Code Table A-III/7.	A mariner who successfully completes the course will satisfy the <i>High-Voltage Power Systems</i> training requirements in 46 CFR 12.611(a)(4)(ii) for an STCW endorsement as Electro-Technical Rating on vessels powered by main propulsion machinery of 750 kW/1,000 HP or more.
Instrumentation & Control Systems	The course should be at least 160 hours and cover all applicable competencies and KUPs in STCW Code Table A-III/6.	A mariner who successfully completes the course will satisfy the <i>Instrumentation & Control Systems</i> training requirements of 46 CFR 11.335(a)(4)(v) for STCW endorsements as electro-technical officer on vessels powered by main propulsion machinery of 750 kW/1,000 HP or more.
Integrated Navigation Equipment	The course should be at least 35 hours and cover all applicable competencies and KUPs in STCW Code Table A-III/6.	A mariner who successfully completes the course will satisfy the <i>Integrated Navigation Equipment</i> training requirements of 46 CFR 11.335(a)(4)(iii) for STCW endorsements as electro-technical officer on vessels powered by main propulsion machinery of 750 kW/1,000 HP or more.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Leadership and Teamworking Skills	The course should be at least 8 hours and include sufficient training and written and practical assessments to ensure that the student has successfully achieved the level of competency and knowledge, understanding, and proficiency specified in Tables A-II/1 and A-III/1 of the STCW Code. A prerequisite for this course should be completion of a Bridge Resource Management or Engine Room Resource Management course. NOTE: This course is “generic” and can be used for both deck and engine departments.	A mariner who successfully completes the course will satisfy the <i>Leadership and Teamworking Skills</i> requirements of 46 CFR 11.309(c)(1); 46 CFR 11.319(b)(1); 46 CFR 11.321(b)(1); and 46 CFR 11.329(a)(4)(iv) and (c). Approval should also include the applicable task numbers from the national assessment guidelines for OICEW and OICNW endorsements. Courses that do not also include training for Engine Room Resource Management (ERM) will note that 46 CFR 11.329(a)(4)(iv) is only satisfied if the mariner also completes approved ERM training.
Leadership and Managerial Skills	The course should be at least 35 hours and include sufficient training and written and practical assessments to ensure that the student has successfully achieved the level of competency and knowledge, understanding, and proficiency specified in Tables A-II/2 and A-III/2 of the STCW Code. NOTE: This course is “generic” and can be used for both deck and engine departments.	A mariner who successfully completes will satisfy the <i>Leadership and Managerial Skills</i> training requirements of 46 CFR 11.305(a)(3)(iv) and (b)(1); 46 CFR 11.307(a)(3)(iv) and (b)(1); 46 CFR 11.311(a)(3)(iv) and (b)(1); 46 CFR 11.313(a)(3)(iv) and (b)(1); 46 CFR 11.315(a)(3)(iii) and (b)(1); 46 CFR 11.317(a)(3)(iv) and (b)(1); 46 CFR 11.325(a)(3)(ii) and (b)(2); 46 CFR 11.327(a)(3)(ii) and (b)(2); 46 CFR 11.331(a)(3)(ii) and (b)(2); and 46 CFR 11.333(a)(3)(ii) and (b)(2).
Limited Master (in lieu of Coast Guard examination)	The course should cover all topics on applicable Coast Guard examination modules for the endorsement. Course length should be comparable to the time spent on similar subjects in <i>Master 100 Tons</i> courses. NOTE: Courses should be for an endorsement with specific geographic and/or other limitations authorized by the cognizant OCMI.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements for a national officer endorsement as Limited Master of <describe endorsement and limitation>.
Limited OUPV (a.k.a. Launch Operator) (in lieu of Coast Guard examination)	The course should cover all topics on applicable Coast Guard examination for the endorsement. Course length should be comparable to the time spent on similar subjects in <i>OUPV</i> courses. NOTE: Courses should be for an OUPV endorsement with specific geographic and/or other limitations authorized by the cognizant OCMI per CG-543 Policy Letter 10-04, <i>Restricted Endorsements for Merchant Mariner Credentials (MMC) as Operator Of Uninspected Passenger Vessels (OUPV)</i> .	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements for a national officer endorsement as Limited OUPV <describe limitation>.
Management of Electrical and Electronic Control Equipment	The course should be at least 35 hours and cover all topics in applicable module of IMO Model Course 7.02, <i>Chief Engineer Officer and Second Engineer Officer</i> .	A mariner who successfully completes the course will satisfy the <i>Management of Electrical and Electronic Control Equipment</i> training requirements of 46 CFR 11.325(a)(3)(iii) and (b)(3); 46 CFR 11.327(a)(3)(iii) and (b)(3); 46 CFR 11.331(a)(3)(iii) and (b)(3); and 46 CFR 11.333(a)(3)(iii) and (b)(3).

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Management of Medical Care	The course should be at least 4 hours and cover all topics in the applicable module of IMO Model Course 7.01, <i>Master and Chief Mate</i> .	A mariner who successfully completes the course will satisfy the <i>Management of Medical Care</i> training requirements of 46 CFR 11.305(a)(3)(ix); 11.307(a)(3)(ix); 11.311(a)(3)(vi); 11.313(a)(3)(vi); and 11.315(a)(3)(ii).
Marlinspike Seamanship (in lieu of Coast Guard examination)	The course should include all knots and splices required on the Coast Guard practical exam for Able Seaman endorsements. This course does not have a minimum length, but all students must pass all exercises, assessments, and tests before they can be considered to have completed the course and dismissed.	A mariner who successfully completes the course within 1 year of application will satisfy the knot-tying demonstration requirements of 46 CFR 12.405(c) for any national rating endorsement as Able Seaman.
Master Less Than 100 GRT (in lieu of Coast Guard examination)	The course should be at least 80 hours and cover all topics on Coast Guard exam modules for an endorsement as Master of near coastal self-propelled vessels of less than 100 GRT.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements for national officer endorsements as Master of near coastal self-propelled vessels of less than 100 GRT. NOTE: Course will also satisfy exam requirements for Master Less Than 100 GRT Great Lakes and/or inland, and also OUPV or Mate Less Than 100 GRT near coastal, and Great Lakes and/or inland.
Master Less Than 200 GRT (in lieu of Coast Guard examination)	The course should be at least 108 hours and cover all topics on Coast Guard exam modules for an endorsement as Master of near coastal self-propelled vessels of less than 200 GRT.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements for national officer endorsements as Master of near coastal self-propelled vessels of less than 200 GRT. NOTE: Course will also satisfy exam requirements for Master Less Than 200 GRT Great Lakes and/or inland, and also OUPV, Master or Mate Less Than 100 GRT and Mate Less Than 200 GRT near coastal, and Great Lakes and/or inland.
Medical Care Person In Charge	The course should be at least 61 hours and be substantially similar to IMO Model Course 1.15, <i>Medical Care</i> . May be given as a 40-hour course the entry standards require completion of an approved Medical Care Provider course within 6 months of starting the PIC course.	A mariner who successfully completes the course will satisfy the following: <ol style="list-style-type: none"> 1. STCW Code Table A-VI/4-2; and 2. the requirements of 46 CFR 12.621(a)(1) and (2) for an STCW endorsement as Person in Charge of Medical Care; and 3. the Management of Medical Care training requirements of 46 CFR 11.305(a)(3)(ix); 11.307(a)(3)(ix); 11.311(a)(3)(vi); 11.313(a)(3)(vi); and 11.315(a)(3)(ii).

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Medical Care Provider (a.k.a. Medical First Aid)	The course should be at least 21 hours and be substantially similar to IMO Model Course 1.14, <i>Medical First Aid</i> .	A mariner who successfully completes the course will satisfy the following: 1. STCW Code Table A-VI/4-1; and 2. the competency requirements of 46 CFR 12.619(a)(2); and the Medical First-Aid Provider training requirements of 46 CFR 11.309(a)(4)(i); 46 CFR 11.317(a)(3)(i); 46 CFR 11.319(a)(4)(i); 46 CFR 11.329(a)(4)(i); 46 CFR 11.335(a)(3)(i); and 46 CFR 12.619(a)(1).
Motor Plants	The course should be at least 120 hours and cover all topics in applicable module of IMO Model Course 7.04, <i>Officer in Charge of an Engineering Watch</i> .	A mariner who successfully completes the course will satisfy the <i>Motor Plants</i> training requirements of 46 CFR 11.329(a)(4)(ix) for STCW endorsements as OICEW on vessels powered by main propulsion machinery of 750 kW/1,000 HP propulsion power or more.
Officer Endorsement Renewal (in lieu of Coast Guard examination)	The course should be at least 7 hours cover all topics on applicable renewal exercises and be of sufficient duration to provide refresher training in all subjects on the exercise.	A mariner who successfully completes the course will satisfy the requirements of 46 CFR 10.227(e)(1)(iii) for renewal of a deck officer endorsement valid for service on vessels less than 200 GRT.
Onboard Computer Networking and Security	The course should be at least 70 hours and cover all applicable competencies and KUPs in STCW Code Table A-III/6.	A mariner who successfully completes the course will satisfy the <i>Onboard Computer Networking and Security</i> training requirements of 46 CFR 11.335(a)(4)(i) for STCW endorsements as electro-technical officer on vessels powered by main propulsion machinery of 750 kW/1,000 HP or more.
OUPV (in lieu of Coast Guard examination)	The course should be at least 54 hours and cover all topics on Coast Guard exam modules for an endorsement as Operator of Uninspected Passenger Vessels (OUPV) near coastal.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements for a national officer endorsement as OUPV near coastal, inland, or Great Lakes and inland.
OUPV Restricted (in lieu of Coast Guard examination)	The course should cover all topics on applicable Coast Guard examination for the endorsement. Course length should be comparable to the time spent on similar subjects in non-restricted OUPV courses. <u>NOTE</u> : Courses should be for an OUPV endorsement with specific geographic and/or other limitations authorized by the cognizant OCMI per CG-543 Policy Letter 10-04, <i>Restricted Endorsements for Merchant Mariner Credentials (MMC) as Operator Of Uninspected Passenger Vessels (OUPV)</i> .	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements for a national officer endorsement as OUPV <describe restriction>.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Personal Safety & Social Responsibilities	The course should be at least 4 hours and be substantially similar to IMO Model Course 1.21, <i>Personal Safety & Social Responsibilities</i> . Should include appropriate assessments of competence for STCW Code Table A-VI/1-4.	A mariner who successfully completes the course will satisfy the <i>Personal Safety and Social Responsibilities</i> training and competency requirements of STCW Code Section A-VI/1 and 46 CFR 11.302(a)(4) and 46 CFR 12.602(a)(4).
Personal Safety & Social Responsibilities Refresher	The course should be at least 2 hours and include refresher training in all subjects in IMO Model Course 1.21, <i>Personal Safety & Social Responsibilities</i> . Course should include appropriate assessments of competence for STCW Code Table A-VI/1-4. When Basic Training Refresher is given as separate courses for each BT element, mariners must complete courses for all elements to show continued competency.	A mariner who successfully completes the course will satisfy the continued competency requirements for STCW <i>Basic Training for Personal Safety and Social Responsibilities</i> in STCW Section A-VI/1 and 46 CFR 11.302(e) and 46 CFR 12.602(e). Mariners must also provide evidence of continued competency in the other areas of Basic Training.
Personal Survival Techniques	The course should be at least 12 hours and be substantially similar to IMO Model Course 1.21, <i>Personal Survival Techniques</i> . Course should include appropriate assessments of competence for STCW Code Table A-VI/1-1.	A mariner who successfully completes the course will satisfy the <i>Personal Safety and Social Responsibilities</i> training and competency requirements of STCW Code Section A-VI/1 and 46 CFR 11.302(a)(1) and 46 CFR 12.602(a)(1).
Personal Survival Techniques Revalidation	The course should be at least 4 hours and include practical exercises and assessments of competence for those areas identified in 46 CFR 11.302(d)(1) and 46 CFR 12.602(d)(1).	A mariner who successfully completes the course will satisfy the continued competency requirements for <i>Personal Survival Techniques</i> in STCW Section A-VI/1, 46 CFR 11.302(d)(1), and 46 CFR 12.602(d)(1), <u>provided</u> that they have at least 1 year of sea service in the last 5 years.
Personal Survival Techniques Refresher	The course should be at least 8 hours and include refresher training in all subjects in IMO Model Course 1.21, <i>Personal Survival Techniques</i> . Course should include appropriate assessments of competence for STCW Code Table A-VI/1-1. When Basic Training Refresher is given as separate courses for each BT element, mariners must complete courses for all elements to show continued competency.	A mariner who successfully completes the course will satisfy the continued competency requirements for STCW <i>Basic Training for Personal Survival Techniques</i> in STCW Section A-VI/1, 46 CFR 11.302(e), and 46 CFR 12.602(e). Mariners must also provide evidence of continued competency in the other areas of Basic Training.
Proficiency in Survival Craft	The course should be at least 30 hours and be substantially similar to IMO Model Course 1.23, <i>Proficiency in Survival Craft and Rescue Boats (Other Than Fast Rescue Boats)</i> . Course should include assessments of competence for STCW Code Table A-VI/2-1. Course should use a full-size gravity davit lifeboat.	A mariner who successfully completes the course will be considered to have met the competency standards of STCW Code Table A-VI/2-1 for an STCW endorsement for <i>Proficiency in Survival Craft and Rescue Boats Other Than Fast Rescue Boats (PSC)</i> and will satisfy the examination and practical demonstration requirements of 46 CFR 12.407(b)(3) for endorsements for Lifeboatman and PSC.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Proficiency in Survival Craft (Limited)	The course should be at least 21 hours and be substantially similar to IMO Model Course 1.23, <i>Proficiency in Survival Craft and Rescue Boats (Other Than Fast Rescue Boats)</i> except that lessons that are only applicable to lifeboats may be omitted. The course should include assessments of competence for STCW Code Table A-VI/2-1 applicable to rescue boats other than lifeboats and fast rescue boats.	A mariner who successfully completes the course will be considered to have met the competency standards of STCW Code Table A-VI/2-1 for an STCW endorsement for <i>Proficiency in Survival Craft and Rescue Boats Other Than Lifeboats and Fast Rescue Boats - Limited (PSC - Limited)</i> and will satisfy the examination and practical demonstration requirements of 46 CFR 12.409(b)(3) for endorsements for Lifeboatman-Limited and PSC-Limited.
QMED-Fireman/Watertender (in lieu of Coast Guard examination)	The course should be at least 120 hours and cover all topics on Coast Guard examination.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements of 46 CFR 12.501(c)(5) for a national rating endorsement as QMED-Fireman/Watertender.
QMED-Junior Engineer (in lieu of Coast Guard examination)	The course should be at least 350 hours and include all subjects as defined in 12.505(c) and cover all topics on Coast Guard examination.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements of 46 CFR 12.501(c)(5) for a national rating endorsement as QMED-Junior Engineer
QMED-Oiler (in lieu of Coast Guard examination)	The course should be at least 120 hours and cover all topics on Coast Guard examination.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements of 46 CFR 12.501(c)(5) for a national rating endorsement as QMED-Oiler.
QMED-Fireman/Oiler/Watertender (in lieu of Coast Guard examination)	The course should be at least 150 hours and cover all topics on Coast Guard examination.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements of 46 CFR 12.501(c)(5) for national rating endorsements as QMED-Oiler and Fireman/Watertender.
QMED-Electrician/Refrigerating Engineer (in lieu of Coast Guard examination)	The course should be at least 240 hours, include all subjects as defined in 12.505(c) and cover all topics on Coast Guard examination.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements of 46 CFR 12.501(c)(5) for a national rating endorsement as QMED- Electrician/Refrigerating Engineer.
Radar Observer (Rivers)	The course should be at least 21 hours and follow curriculum guidance in NVIC 9-94, <i>Guidelines for Training and Certification in the Use of Marine Radar</i> .	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 11.480(d) for an endorsement as Radar Observer (Rivers).
Radar Observer (Inland)	The course should be at least 28 hours and follow curriculum guidance in NVIC 9-94, <i>Guidelines for Training and Certification in the Use of Marine Radar</i> .	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 11.480(d) for an endorsement as Radar Observer (Inland).

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Radar Observer (Unlimited)	The course should be at least 35 hours and follow curriculum guidance in NVIC 9-94, <i>Guidelines for Training and Certification in the Use of Marine Radar</i> . The course should include applicable assessments of competence for STCW endorsements as Officer in Charge of a Navigational Watch (OICNW), Chief Mate, and Master.	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 11.480(d) for an endorsement as Radar Observer (Unlimited) and of 46 CFR 11.309(a)(4)(ii); 11.317(a)(3)(vi); 11.319(a)(4)(ii); and 11.321(a)(3)(vi) for STCW endorsements.
Radar Observer Recertification	The course should have the same practical assessments as the original course for the applicable type of radar observer endorsement. This course does not have a minimum length, but all students must pass all exercises, assessments, and tests before they can be considered to have completed the course.	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 11.480(f) for maintaining the validity of an endorsement as Radar Observer.
Radar Observer Refresher	The course should have refresher training and the same practical assessment as the original course for the applicable type of radar observer endorsement.	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 11.480(f) for maintaining the validity of an endorsement as Radar Observer.
Radio Electronics	The course should be at least 240 hours and cover all applicable competencies and KUPs in STCW Code Table A-III/6.	A mariner who successfully completes the course will satisfy the <i>Radio Electronics</i> training requirements of 46 CFR 11.335(a)(4)(ii) for STCW endorsements as electro-technical officer on vessels powered by main propulsion machinery of 750 kW/1,000 HP or more.
Rules of the Road (in lieu of Coast Guard examination)	The course should be at least 16 hours and cover all topics on Coast Guard examination module 054xx, International and Inland Rules of the Road. Passing grade of examinations should be not less than 90%.	A mariner who successfully completes the course within 1 year of application will satisfy the professional examination requirements for original issuance, increase in scope, or renewal of any national officer endorsement up to Master 200 GRT, Master or Mate of Fishing Vessels, and Apprentice Mate (Steersman).
Search & Rescue (Operational Level)	The course should be at least 14 hours and cover all topics in applicable module of IMO Model Course 7.03, <i>Officer in Charge of a Navigational Watch</i> . Should include appropriate assessments from the relevant portions of STCW Code Table A-II/1.	A mariner who successfully completes the course will satisfy the <i>Search and Rescue</i> training requirements of 46 CFR 11.309(a)(4)(iii) for an STCW endorsement as OICNW on vessels of 500 GT or more.
Search & Rescue (Management Level)	The course should be at least 14 hours and cover all topics in applicable module of IMO Model Course 7.01, <i>Master and Chief Mate</i> . Should include appropriate assessments from the relevant portions of STCW Code Table A-II/2.	A mariner who successfully completes the course will satisfy the <i>Search and Rescue</i> training requirements of 46 CFR 11.305(a)(3)(v) and 11.307(a)(3)(v) for STCW endorsements as Chief Mate or Master on vessels of 3,000 GT or more and 46 CFR 11.311(a)(3)(v) and 11.313(a)(3)(v) for STCW endorsements as Chief Mate or Master on vessels of more than 500 GT and less than 3,000 GT.
Security Awareness	The course should be at least 4 hours and be substantially similar to IMO Model Course 3.27, <i>Security Awareness Training for all Seafarers</i> .	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 12.627(a)(1) and STCW Table A-VI/6-1 for an STCW endorsement for Security Awareness.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Ship Propulsion & Auxiliary Machinery	The course should be at least 120 hours and cover all applicable competencies and KUPs in STCW Code Table A-III/6.	A mariner who successfully completes the course will satisfy the <i>Ship Propulsion and Auxiliary Machinery</i> training requirements of 46 CFR 11.335(a)(4)(iv) for STCW endorsements as electro-technical officer on vessels powered by main propulsion machinery of 750 kW/1,000 HP or more.
Simulator Instructor	The course should be at least 35 hours and be substantially similar to the IMO Model Course 6.10, <i>Train the Simulator Trainer and Assessor</i> or the Simulator Instructor course developed by the Maritime Academy Simulation Committee (MASC).	A mariner who successfully completes the course will satisfy the simulator instructor training requirements of Section A-I/6, Paragraph 4.3.1 of the STCW Code.
Stability & Ship Construction	The course should be 40 hours and cover all topics in applicable module of IMO Model Course 7.03, <i>Officer in Charge of a Navigational Watch</i> .	A mariner who successfully completes the course will satisfy the <i>Stability & Ship Construction</i> training requirements of 46 CFR 11.309(a)(4)(xii) for an STCW endorsement as OICNW on vessels of 500 GT or more.
Stability & Ballast Control	The course should be at least 35 hours and cover principles of stability control applicable to MODUs.	A mariner who successfully completes the course will satisfy the <i>Stability</i> training requirements of 46 CFR 11.470(b)(2)(i), (d)(2)(i), (f)(2)(i), (h)(2)(i) and (j)(2)(i); 46 CFR 11.472(a)(2)(i); and 46 CFR 11.474(a)(2)(i). [<i>List of CFR requirements should be revised as appropriate for the specific course.</i>]
Standard Marine Communication Phrases (SMCP)	The course should be at least 4 hours and cover all topics in IMO Model Course 3.17, <i>Maritime English</i> (core section 2). <u>NOTE:</u> Courses to meet this requirement may be either a single comprehensive course for watchkeeping, COLREGS, and Standard Marine Communication Phrases, or separate courses for each component.	A mariner who successfully completes the course will satisfy the SMCP training requirements of 46 CFR 11.309(a)(4)(ix) for STCW endorsements as OICNW on vessels of 500 GT or more.
Steam Endorsement	The course should be at least 180 hours and include theory, construction, operation, troubleshooting, maintenance, and emergency response for steam boilers and turbines.	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 11.502(b)(4) to add an endorsement for steam propulsion to a national engineer officer endorsement valid for gas turbine and/or motor propulsion.
Steam Plants	The course should be at least 180 hours and cover all topics in applicable module of IMO Model Course 7.04, <i>Officer in Charge of an Engineering Watch</i> .	A mariner who successfully completes the course will satisfy the <i>Steam Plants</i> training requirements of 46 CFR 11.329(a)(4)(viii) for STCW endorsements as OICEW on vessels powered by main propulsion machinery of 750 kW/1,000 HP propulsion power or more.
Tank Barge Fire Fighting	The course should be at least 16 hours and cover all subjects in Table 3 to 46 CFR 13.121(e).	A mariner who successfully completes the course will satisfy the firefighting training requirements of 46 CFR 13.401(d) for any endorsement as Tankerman-PIC (Barge).

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Tank Barge Dangerous Liquids	The course should be at least 32 hours and cover all subjects in Table 2 to 46 CFR 13.121(e).	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 13.201(c)(4) for an endorsement as Tankerman-PIC (Barge) DL.
Tank Barge Liquefied Gases	The course should be at least 32 hours and cover all subjects in Table 2 to 46 CFR 13.121(e).	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 13.201(c)(4) for an endorsement as Tankerman-PIC (Barge) LG.
Tank Ship Dangerous Liquids	The course should be at least 40 hours and cover all subjects in Table 2 to 46 CFR 13.121(e) and STCW Code Tables A-V/1-1-2 and A-V/1-1-3.	<p>A mariner who successfully completes the course will satisfy:</p> <ol style="list-style-type: none"> 1. the training requirements of 46 CFR 13.201(c)(4) for an endorsement as Tankerman-PIC DL and 13.201(c)(4) for an endorsement as Tankerman-PIC (Barge) DL; 2. the requirements of 46 CFR 13.603(a)(2), 46 CFR 13.603(b)(2), 46 CFR 13.603(c)(2) and STCW Code Table A-V/1-1-2 for an STCW endorsement for Advanced Oil Tanker Cargo Operations; and 3. the requirements of 46 CFR 13.605(a)(2), 46 CFR 13.605(b)(2), 46 CFR 13.605(c)(2) and STCW Code Table A-V/1-1-3 for an STCW endorsement for Advanced Chemical Tanker Cargo Operations. <p>NOTE: The course will also satisfy training requirements for endorsements as Tankerman-Assistant DL, Tankerman-Engineer DL, and Basic Oil and Chemical Tanker Cargo Operations.</p>
Tank Ship Familiarization (Dangerous Liquids)	The course should be at least 30 hours and cover all subjects in Table 1 to 46 CFR 13.121(e) and STCW Code Table A-V/1-1-1.	<p>A mariner who successfully completes the course will satisfy:</p> <ol style="list-style-type: none"> 1. the training requirements of 46 CFR 13.401(e)(1) for an endorsement as Tankerman-Assistant DL; and 2. the requirements of 46 CFR 13.609(a)(2) and STCW Code Table A-V/1-1-1 for an endorsement for Basic Oil and Chemical Tanker Cargo Operations.
Tank Ship Familiarization (Liquefied Gases)	The course should be at least 30 hours and cover all subjects in Table 1 to 46 CFR 13.121(e) and STCW Code Table A-V/1-2-1.	<p>A mariner who successfully completes the course will satisfy:</p> <ol style="list-style-type: none"> 1. the training requirements of 46 CFR 13.401(e)(1) for an endorsement as Tankerman-Assistant LG; and 2. the requirements of 46 CFR 13.611(a)(2) and STCW Code Table A-V/1-2-1 for an endorsement for Basic Liquefied Gas Tanker Cargo Operations.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Tank Ship Liquefied Gases	The course should be at least 40 hours and cover all subjects in Table 2 to 46 CFR 13.121(e) and STCW Code Table A-V/1-2-2.	A mariner who successfully completes the course will satisfy: 1. the training requirements of 46 CFR 13.201(c)(4) for an endorsement as Tankerman-PIC LG and 13.201(c)(4) for an endorsement as Tankerman-PIC (Barge) LG; and 2. the requirements of 46 CFR 13.607(a)(2), 46 CFR 13.607(b)(2), 46 CFR 13.607(c)(2) and STCW Code Table A-V/1-1-2 for an STCW endorsement for Advanced Liquefied Gas Tanker Cargo Operations. NOTE: The course will also satisfy training requirements for endorsements as Tankerman-Assistant LG, Tankerman-Engineer LG, and Basic Liquefied Gas Tanker Cargo Operations.
Terrestrial Navigation (Operational Level)	The course should be 80 hours and cover all topics in applicable module of IMO Model Course 7.03, <i>Officer in Charge of a Navigational Watch</i> . NOTE: Courses to meet this requirement may be either a single comprehensive course for terrestrial navigation, celestial navigation, and electronic navigation systems, or separate courses for each component.	A mariner who successfully completes the course will satisfy the <i>Terrestrial Navigation</i> training requirements of 46 CFR 11.309(a)(4)(viii) for STCW endorsements as OICNW on vessels of 500 GT or more.
Vessel Personnel with Designated Security Duties	The course should be at least 10.5 hours and be substantially similar to IMO Model Course 3.26, <i>Security Training for Seafarers with Designated Security Duties</i> .	A mariner who successfully completes the course will satisfy the training requirements of 46 CFR 12.625(a)(1) and STCW Table A-VI/6-2 for an STCW endorsement as Vessel Personnel with Designated Security Duties.
Vessel Security Officer	At this time, the Coast Guard is not approving Vessel Security Officer courses. These courses must be submitted to a Coast Guard approved Quality Standards Systems (QSS) Organization for acceptance. To be accepted, courses should be at least 16 hours and be substantially similar to IMO Model Course 3.19, <i>Ship Security Officer</i> .	A mariner who successfully completes the course will satisfy the training requirements of 33 CFR 104.215(d)(iv) and STCW Code Section A-VI/5 for an STCW endorsement as Vessel Security Officer.
Visual Communications (Flashing Light)	The course should include written or practical assessments of students' ability to use the International Code of Signals and practical assessments of ability to receive by Morse Light the distress signal "SOS" and single-letter signals. Practical assessment should be conducted at a transmission speed of at least 4 words per minute. Students are permitted to use scrap paper to record dots and dashes during transmission. This course does not have a minimum length, but all students must pass all exercises, assessments, and tests before they can be considered to have completed the course and dismissed.	A mariner who successfully completes the course will satisfy the <i>Visual Signaling</i> requirements of 11.309(a)(4)(vi) and 46 CFR 11.319(a)(4)(vi) and will be considered to have successfully completed assessment number 8.2.A for an STCW endorsement as Officer in Charge of a Navigational Watch on Vessels of 500 GT or more.

COURSE	CURRICULUM GUIDANCE	SAMPLE APPROVAL
Watchkeeping (Operational Level)	The course should be at least 35 hours and cover all topics in applicable module of IMO Model Course 7.03, <i>Officer in Charge of a Navigational Watch</i> . <u>NOTE</u> : Courses to meet this requirement may be either a single comprehensive course for watchkeeping, COLREGS, and Standard Marine Communication Phrases, or separate courses for each component. The course may also be combined with a <i>Bridge Resource Management</i> course.	A mariner who successfully completes the course will satisfy the <i>Watchkeeping</i> training requirements of 46 CFR 11.309(a)(4)(ix) for an STCW endorsement as OICNW on vessels of 500 GT or more and 46 CFR 11.319(a)(4)(iii) for an STCW endorsement as OICNW on vessels of less than 500 GT.

GUIDELINES FOR COURSES USING SIMULATORS

1. GENERAL.

- a. The purpose of this document is to provide guidance to organizations seeking Coast Guard approval of courses using simulators. The Coast Guard does not approve or certify simulators used for mariner training. Rather, the Coast Guard approves a comprehensive course curriculum, of which simulators may be a part. As part of its evaluation of a course, the Coast Guard will determine if the proposed use of simulators is appropriate for the course and if the simulators can support the learning objectives of the course.
- b. The intent of this document is not to impose restrictive standards or equipment specifications that are difficult to attain, but rather provide guiding principles that are general enough to allow free choice of readily available simulation tools. In the context of course approval, the Coast Guard determines whether or not the proposed simulator meets the performance standards used in the course to determine learning objective competency.
- c. The following topics are discussed:
 - 1) Simulator Acceptance Criteria:
 - i) Functional characteristics; and
 - ii) Performance standards.
 - 2) Course Content:
 - i) Competencies;
 - ii) Learning objectives;
 - iii) Presentations/demonstrations; and
 - iv) Practical exercises.
 - 3) Student Assessment:
 - i) Assessment criteria; and
 - ii) Final examinations.
 - 4) Instructor Qualifications:
 - i) Simulator instructor.

2. DEFINITION OF TERMS.

- a. *Competency* – a set of defined behaviors that provide a structured guide enabling the development and evaluation of trainees.
- b. *Learning Objective* – the desired performance outcome, constrained by the condition, and qualified by the standard.
- c. *Performance Standard* – the stated behaviors or results that are expected for performance to be considered satisfactory.
- d. *Simulator* – a device that mimics the functional, and sometimes aesthetic, characteristics of the object of training, when it is not practical because of size or expense, to use the actual object.

3. DISCUSSION.

- a. Simulator Acceptance Criteria:
 - 1) The functional characteristics of any simulator used in training should imitate those of the shipboard equipment that is the subject of the training. STCW Section A-I/12 lists the performance standards for simulators used in training and assessment. These criteria will be applied in the evaluation of requests to approve training using simulators.
- b. Course Content:
 - 1) Course providers should list the proposed simulator in the *Course Framework* under *Facilities and Equipment*. The manufacturer's documentation should be included with the submission of the complete course curriculum package. If the Coast Guard is not familiar with a simulator, it may be necessary to conduct a site visit to evaluate the capabilities of the simulator.
 - 2) The course provider should explain in detail how the simulator will be used in meeting the learning objectives in terms of presentations, demonstrations, practical exercises, and assessments. Inclusion of pictures, screen shots, data sheets and any other practical representation of the simulator capability and use will assist the Coast Guard in making a final determination as to the simulators appropriateness for use.
- c. Student Assessment:
 - 1) Student assessments should effectively measure the student's competency in the stated learning objectives and provide feedback to the student and to the course provider to evaluate student progress. All students should be afforded the opportunity to adequately participate in, practice, and perform all of the required exercises.
 - 2) Debriefs of each simulator exercise should be conducted to review the outcomes in terms of learning objectives met, competencies learned, lessons learned, and areas

- needing improvement. These debriefs will serve to reinforce and solidify the learning experience.
- 3) Final practical assessments should correlate to the stated learning objectives of the course. The Examination and Assessment Policy should provide detailed descriptions of all practical or simulator examinations, tests, or exercises that describe the situation presented to the student; what the students must do to successfully complete each test; and how each student's performance will be evaluated and recorded. Provide a separate checklist to evaluate each practical examination and what is considered a passing score. The initial simulation setup for each assessment should be described in detail in the *Instructor Notes* (Part D-2) of the curriculum package described in 46 CFR 10.402(b) and Enclosure (1).
- d. Instructor Qualifications:
- 1) Section A-I/6 of the STCW Code states that any person conducting training using a simulator should have received appropriate guidance in instructional techniques using a simulator and have gained practical experience on the particular type of simulator being used. This guidance should include development of and sequencing of simulated scenarios that have specific learning objectives. Accordingly, all proposed instructors for simulator-based training should provide documentary evidence of having received the appropriate guidance on the use of simulators. This could be in the form of a simulator "Train-the-Trainer" course, such as IMO Model Course No. 6.10, *Train the Simulator Trainer and Assessor*, or the simulator instructor course developed by the Maritime Academy Simulation Committee (MASC).

GUIDELINES FOR DISTANCE AND E-LEARNING COURSES

1. GENERAL.

The intent of this document is not to impose restrictive standards that are difficult to attain, but rather provide guiding principles that are general enough to allow free choice of readily available development tools and individual creativity. This philosophy will also serve to create a level playing field for all organizations, large or small, desiring entry into the highly competitive realm of distance-learning course providers and it will help to ensure development of best practices of this methodology for delivering training. The following topics are discussed:

a. Administration:

- 1) Registration;
- 2) Student records;
- 3) Course evaluation; and
- 4) Student feedback.

b. Course Navigation:

- 1) Logging on;
- 2) Functionality of controls (menus, buttons, icons, etc.); and
- 3) Advancing through the course (sequential or random).

c. Student Interactivity:

- 1) Use of multimedia;
- 2) Questions from the students (e-mail, on-line chat, phone);
- 3) Discussion groups;
- 4) Access to reference materials/tools; and
- 5) Student progress.

d. Course Content:

- 1) Competencies;
- 2) Learning objectives;
- 3) Presentations; and
- 4) Exercises.

- e. Student Assessment:
 - 1) Periodic feedback;
 - 2) Assessment criteria; and
 - 3) Final examination.
- f. Instructor Qualifications:
 - 1) On-line course;
 - 2) Live on-line interactive classroom course;
 - 3) Blended course; and
 - 4) Examination proctors.

2. DEFINITION OF TERMS.

- a. *Blended Learning* – a combination of distance learning (on-line) and classroom learning.
- b. *Competency* – a set of defined behaviors that provide a structured guide enabling the development and evaluation of trainees.
- c. *Distance Learning* – learning that takes place outside of, but connected to, the institution of learning through electronic means, usually the internet (on-line).
- d. *e-Learning* – another term used for distance learning.
- e. *Learning Objective* – the desired performance outcome, constrained by the condition, and qualified by the standard.
- f. *Multimedia* – a variety of sensory stimulations (e.g., audio, video, text, images).
- g. *Proctor* – in the educational context, one who supervises the examination.
- h. *Third Party* – an individual or party other than the two principals; in this context, an independent testing organization.

3. DISCUSSION.

- a. Administration:
 - 1) Administration consists of student registration, maintaining student records, course evaluation, and managing student feedback. Security and confidentiality of student identity and files is critical in each of these elements. The student registration process should be straight forward and easily accomplished by various computer literacy levels. Student registration data is the basis for establishing student records and feedback procedures.

- 2) The student should know before committing to the course what resources will be provided by the school and how they will be provided. These resources may include reference textbooks, charts, maps, navigational tools, additional information, resources, etc. Some of these may be accessed through the course delivery software on-line, some may be mailed to the student, or the student may be required to acquire them. Also, student computer requirements should be clearly communicated to ensure that the student is technically able to participate in the course. Examples of computer requirements include processor speed, memory capacity, internet connection speed, graphics, and monitor resolution. There may be others depending on the instructional techniques used in the course.
 - 3) Distance and e-learning may not be the most optimal learning modality for every student. Research has shown that different people learn in different ways. Offering a sample distance-learning lesson to prospective students could improve student attrition rates and minimize frustration. This would allow the student to get a preview of what is expected prior to making the full commitment.
 - 4) Records of students' attendance and final examination scores, including practical tests administered, must be kept on file for at least 5 years following their course completion date. [46 CFR 10.403(a)(6)] These records may be kept electronically but must be readily available upon request from the National Maritime Center (NMC).
 - 5) In addition to the other terms and conditions of course approval for a classroom course, the school should provide the NMC with a non-expiring User ID and Password to allow access to the course and final proctored examinations at any time by course evaluators and auditors. Unless otherwise notified, the User ID and Password should be the same as those used to review and evaluate the course.
 - 6) Internal feedback and evaluation may be accomplished pre or post final examination. Unbiased student survey responses are more likely to be obtained after all of the course instructional material has been completed, but prior to administration of the final examination. Electronic student survey forms or paper forms may be used.
- b. Course Navigation:
- 1) The term "course navigation" pertains to how the student interacts with the course delivery application software to progress through the course. The course registration and log on procedure should be simple and straight forward. The means to accomplish course registration is the school's choice (i.e., mail, phone, or on-line). The school may provide the course log on ID and password for the students, or the course delivery application software may enable the students to establish it for themselves. Student personal data that is collected must be securely maintained.
 - 2) The functionality of course navigation controls should be explained in the front matter after a successful course log on. Intuitive symbology will enhance ease of navigation and thereby provide the student a measure of confidence from the

beginning. Complex controls and indicators tend to stifle student progress through the course and may lead to increased attrition rates.

- 3) A sequential, orderly, and logical course progression, as in a classroom course, is preferred over random selection of topics.

c. Student Interactivity:

The level of student interactivity is determined by the number of human senses required to be used by the student to actively participate in the course. Options may include something as simple as reading a specific topic in a reference document or listening to an audio clip of radio transmissions from the bridge. It could involve viewing live video of an instructor giving a presentation about safety drills or participating in an on-line chat forum to discuss a reading assignment.

d. Course Content:

An approved course should cover specific competencies, in full or in part. Learning objectives should be developed that support the required competencies. The learning objectives should be clear statements of all intended learning outcomes. The course presentation should provide sufficient detail to enable the student to master the learning objectives.

e. Student Assessment:

- 1) Student assessments should effectively measure the student's mastery of the stated objectives and provide feedback to the student and to the course provider to evaluate student progress.
- 2) Student assessments should be conducted in the form of periodic feedback throughout the course. An example of periodic feedback is a quiz at the end of a topic or module with successful completion being required in order to advance to the next topic or module. An on-line course should be designed to provide immediate feedback to the student. This will enhance student mastery of the learning objectives.
- 3) A live proctored final examination should be given that is comprehensive and measures the students' mastery of all of the course's learning objectives. The students' performance on the final examination(s) determines whether or not credit is awarded for successful completion of the course. The criteria for successful completion of the course should be clearly communicated to the students. Final examination sites as well as examination proctors should be documented in the *Course Framework* and be approved by the NMC. Consideration should be given to the requirements of the examination to ensure that the room can accommodate charts, maps, and any other reference material or equipment needed by the student.
- 4) The live proctored final examinations may be administered by professional testing organizations. These third-party companies should be described in the course approval request and are approved in conjunction as part of the course curriculum.

When third parties and testing locations are identified and described in the course documentation, it is not necessary to request site approval prior to each testing schedule for these locations.

- 5) Student identity should be validated at the live proctored final examination sites.

f. Instructor Qualifications:

- 1) As specified in 46 CFR 10.402 and 10.407, a list of instructors with their qualifications must accompany a request for a course approval. Different instructor qualifications are needed depending on course delivery technique (e.g., on-line, live on-line interactive classroom, and blended) as discussed herein.
- 2) Instructors for conventional on-line courses do not deliver instruction as is typical in a classroom course. Rather, distance and e-learning instructors answer questions from students who contact them by phone, e-mail, instant message, or other methods provided for in the course. Therefore, instructors should be subject matter experts, but may also need to be able to answer any questions that students ask about navigating the course delivery software, logging on, changing the password, registering for final live proctored examinations, etc.
- 3) Instructor qualifications for a live on-line interactive classroom course are the most demanding of any of the delivery techniques. Not only should instructors possess traditional qualifications to teach the course, but they should also be capable of simultaneously operating the technology to deliver the course live to students who are at a distance. This includes the use of technology such as personal computers connecting to student audiences via the internet using web cams, microphones, speakers, smart boards, Skype, and other audio-video training and conferencing technologies. Many colleges and universities are now offering courses in on-line instructor qualifications and techniques.
- 4) A blended course may be a combination of one of the two delivery techniques previously discussed and a period of traditional classroom instruction. The purpose of the traditional classroom instruction is for hands-on practical exercises and assessments that may be part of the course, but could not be effectively delivered on-line. The instructor conducting the classroom portion of a blended course should be qualified in the specific proficiency or competency to deliver the theoretical as well as the practical instruction. For example; if the practical instruction involves the use of a simulator, the instructor must possess the qualifications, in enclosure (4), of a simulator instructor as well
- 5) Examination proctors may be used to administer the live proctored final written examinations for a distance learning course. The proctors may not provide any instruction and must be trained in examination administration and specific exam room administration requirements of the school.
- 6) Instructors submitted by schools should meet the aforementioned qualifications specific to the course approval request.

**Excerpts from the International Convention on Standards of
Training, Certification and Watchkeeping for Seafarers, 1978, as
amended**

and

**Seafarers' Training, Certification and Watchkeeping Code, as
amended**

Notice: These excerpts are provided for background information. By themselves, they do not constitute Coast Guard policy.

The Manila Amendments to the annex to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978

Chapter I
General provisions

Regulation I/6

Training and assessment

Each party shall ensure that:

- .1 the training and assessment of seafarers, as required under the Convention, are administered, supervised and monitored in accordance with the provisions of section A-I/6 of the STCW Code; and
- .2 those responsible for the training and assessment of competence of seafarers, as required under the Convention, are appropriately qualified in accordance with the provisions of section A-I/6 of the STCW Code for the type and level of training and assessment involved.

Regulation I/12

Use of simulators

1 The performance standards and other provisions set forth in section A-I/12 and such other requirements as are prescribed in part A of the STCW Code for any certificate concerned shall be complied with in respect of:

- .1 all mandatory simulator-based training;
- .2 any assessment of competency required by part A of the STCW Code which is carried out by means of a simulator; and
- .3 any demonstration, by means of a simulator, of continued proficiency required by part A of the STCW Code.

**The Manila Amendments to the Seafarers' Training, Certification and Watchkeeping
(STCW) Code**

Chapter I

Standards regarding general provisions

Section A-I/6

Training and assessment

1 Each Party shall ensure that all training and assessment of seafarers for certification under the Convention is:

- .1** structured in accordance with written programmes, including such methods and media of delivery, procedures, and course material as are necessary to achieve the prescribed standard of competence; and
- .2** conducted, monitored, evaluated and supported by persons qualified in accordance with paragraphs 4, 5 and 6.

2 Persons conducting in-service training or assessment on board ship shall only do so when such training or assessment will not adversely affect the normal operation of the ship and they can dedicate their time and attention to training or assessment.

Qualifications of instructors, supervisors and assessors*

3 Each Party shall ensure that instructors, supervisors and assessors are appropriately qualified for the particular types and levels of training or assessment of competence of seafarers either on board or ashore, as required under the Convention, in accordance with the provisions of this section.

In-service training

4 Any person conducting in-service training of a seafarer, either on board or ashore, which is intended to be used in qualifying for certification under the Convention, shall:

- .1** have an appreciation of the training programme and an understanding of the specific training objectives for the particular type of training being conducted;
- .2** be qualified in the task for which training is being conducted; and
- .3** if conducting training using a simulator:
 - .3.1** have received appropriate guidance in instructional techniques involving the use of simulators; and
 - .3.2** have gained practical operational experience on the particular type of simulator being used.

5 Any person responsible for the supervision of in-service training of a seafarer intended to be used in qualifying for certification under the Convention shall have a full understanding of the training programme and the specific objectives for each type of training being conducted.

* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

Assessment of competence

6 Any person conducting in-service assessment of competence of a seafarer, either on board or ashore, which is intended to be used in qualifying for certification under the Convention, shall:

- .1** have an appropriate level of knowledge and understanding of the competence to be assessed;
- .2** be qualified in the task for which the assessment is being made;
- .3** have received appropriate guidance in assessment methods and practice;
- .4** have gained practical assessment experience; and
- .5** if conducting assessment involving the use of simulators, have gained practical assessment experience on the particular type of simulator under the supervision and to the satisfaction of an experienced assessor.

Training and assessment within an institution

7 Each Party which recognizes a course of training, a training institution, or a qualification granted by a training institution, as part of its requirements for the issue of a certificate required under the Convention, shall ensure that the qualifications and experience of instructors and assessors are covered in the application of the quality standard provisions of section A-I/8. Such qualification, experience and application of quality standards shall incorporate appropriate training in instructional techniques, and training and assessment methods and practice, and shall comply with all applicable requirements of paragraphs 4 to 6.

Section A-I/12

Standards governing the use of simulators

Part 1 – Performance standards

General performance standards for simulators used in training

1 Each Party shall ensure that any simulator used for mandatory simulator-based training shall:

- .1** be suitable for the selected objectives and training tasks;
- .2** be capable of simulating the operating capabilities of shipboard equipment concerned, to a level of physical realism appropriate to training objectives, and include the capabilities, limitations and possible errors of such equipment;
- .3** have sufficient behavioural realism to allow a trainee to acquire the skills appropriate to the training objectives;
- .4** provide a controlled operating environment, capable of producing a variety of conditions, which may include emergency, hazardous or unusual situations relevant to the training objectives;
- .5** provide an interface through which a trainee can interact with the equipment, the simulated environment and, as appropriate, the instructor; and
- .6** permit an instructor to control, monitor and record exercises for the effective debriefing of trainees.

General performance standards for simulators used in assessment of competence

2 Each Party shall ensure that any simulator used for the assessment of competence required under the Convention or for any demonstration of continued proficiency so required shall:

- .1** be capable of satisfying the specified assessment objectives;
- .2** be capable of simulating the operational capabilities of the shipboard equipment concerned to a level of physical realism appropriate to the assessment objectives, and include the capabilities, limitations and possible errors of such equipment;
- .3** have sufficient behavioural realism to allow a candidate to exhibit the skills appropriate to the assessment objectives;
- .4** provide an interface through which a candidate can interact with the equipment and simulated environment;
- .5** provide a controlled operating environment, capable of producing a variety of conditions, which may include emergency, hazardous or unusual situations relevant to assessment objectives; and
- .6** permit an assessor to control, monitor and record exercises for the effective assessment of the performance of candidates.

Additional performance standards

3 In addition to meeting the basic requirements set out in paragraphs 1 and 2, simulation equipment to which this section applies shall meet the performance standards given hereunder in accordance with their specific type.

Radar simulation

4 Radar simulation equipment shall be capable of simulating the operational capabilities of navigational radar equipment which meets all applicable performance standards adopted by the Organization* and incorporate facilities to:

- .1** operate in the stabilized relative-motion mode and sea- and ground-stabilized true-motion modes;
- .2** model weather, tidal streams, current, shadow sectors, spurious echoes and other propagation effects, and generate coastlines, navigational buoys and search and rescue transponders; and
- .3** create a real-time operating environment incorporating at least two own-ship stations with ability to change own ship's course and speed, and include parameters for at least 20 target ships and appropriate communication facilities.

Automatic Radar Plotting Aid (ARPA) simulation

5 ARPA simulation equipment shall be capable of simulating the operational capabilities of ARPAs which meet all applicable performance standards adopted by the Organization*, and shall incorporate the facilities for:

* See relevant/appropriate performance standards adopted by the Organization.

- .1 manual and automatic target acquisition;
- .2 past track information;
- .3 use of exclusion areas;
- .4 vector/graphic time-scale and data display; and
- .5 trial manoeuvres.

Part 2 – Other provisions

Simulator training objectives

6 Each Party shall ensure that the aims and objectives of simulator-based training are defined within an overall training programme and that specific training objectives and tasks are selected so as to relate as closely as possible to shipboard tasks and practices.

Training procedures

- 7 In conducting mandatory simulator-based training, instructors shall ensure that:
- .1 trainees are adequately briefed beforehand on the exercise objectives and tasks and are given sufficient planning time before the exercise starts;
 - .2 trainees have adequate familiarization time on the simulator and with its equipment before any training or assessment exercise commences;
 - .3 guidance given and exercise stimuli are appropriate to the selected exercise objectives and tasks and to the level of trainee experience;
 - .4 exercises are effectively monitored, supported as appropriate by audio and visual observation of trainee activity and pre- and post-exercise evaluation reports;
 - .5 trainees are effectively debriefed to ensure that training objectives have been met and that operational skills demonstrated are of an acceptable standard;
 - .6 the use of peer assessment during debriefing is encouraged; and
 - .7 simulator exercises are designed and tested so as to ensure their suitability for the specified training objectives.

Assessment procedures

8 Where simulators are used to assess the ability of candidates to demonstrate levels of competency, assessors shall ensure that:

- .1 performance criteria are identified clearly and explicitly and are valid and available to the candidates;
- .2 assessment criteria are established clearly and are explicit to ensure reliability and uniformity of assessment and to optimize objective measurement and evaluation, so that subjective judgements are kept to the minimum;

- .3 candidates are briefed clearly on the tasks and/or skills to be assessed and on the tasks and performance criteria by which their competency will be determined;
- .4 assessment of performance takes into account normal operating procedures and any behavioural interaction with other candidates on the simulator or with simulator staff;
- .5 scoring or grading methods to assess performance are used with caution until they have been validated; and
- .6 the prime criterion is that a candidate demonstrates the ability to carry out a task safely and effectively to the satisfaction of the assessor.

Qualifications of instructors and assessors^{*}

9 Each Party shall ensure that instructors and assessors are appropriately qualified and experienced for the particular types and levels of training and corresponding assessment of competence as specified in regulation I/6 and section A-I/6.

^{*} The relevant IMO Model Course(s) and resolution MSC.64(67), *Recommendations on new and amended performance standards*, may be of assistance in the preparation of courses.

**GUIDANCE REGARDING PROVISIONS OF THE ANNEX TO
THE STCW CONVENTION
PART B**

Chapter I

Guidance regarding general provisions

Section B-I/6

Guidance regarding training and assessment

Qualifications of instructors and assessors

1 Each Party should ensure that instructors and assessors are appropriately qualified and experienced for the particular types and levels of training or assessment of competence of seafarers, as required under the Convention, in accordance with the guidelines in this section.

In-service training and assessment

2 Any person, on board or ashore, conducting in-service training of a seafarer intended to be used in qualifying for certification under the Convention should have received appropriate guidance in instructional techniques*.

3 Any person responsible for the supervision of in-service training of a seafarer intended to be used in qualifying for certification under the Convention should have appropriate knowledge of instructional techniques and of training methods and practice.

4 Any person, on board or ashore, conducting an in-service assessment of the competence of a seafarer intended to be used in qualifying for certification under the Convention should have:

- .1** received appropriate guidance in assessment methods and practice* ; and
- .2** gained practical assessment experience under the supervision and to the satisfaction of an experienced assessor.

5 Any person responsible for the supervision of the in-service assessment of competence of a seafarer intended to be used in qualifying for certification under the Convention should have a full understanding of the assessment system, assessment methods and practice*.

Use of distance learning and e-learning

6 Parties may allow the training of seafarers by distance learning and e-learning in accordance with the standards of training and assessment set out in section A-I/6 and the guidance given below.

Guidance for training by distance learning and e-learning

7 Each Party should ensure that any distance learning and e-learning programme:

- .1** is provided by an entity that is approved by the Party;
- .2** is suitable for the selected objectives and training tasks to meet the competence level for the subject covered;

* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

- .3 has clear and unambiguous instructions for the trainees to understand how the programme operates;
- .4 provides learning outcomes that meet all the requirements to provide the underpinning knowledge and proficiency of the subject;
- .5 is structured in a way that enables the trainee to systematically reflect on what has been learnt through both self assessment and tutor-marked assignments; and
- .6 provides professional tutorial support through telephone, facsimile or e-mail communications.

8 Companies should ensure that a safe learning environment is provided and that there has been sufficient time provided to enable the trainee to study.

9 Where e-learning is provided, common information formats such as XML (Extensible Markup Language), which is a flexible way to share both the format and the data on the World Wide Web, intranets, and elsewhere, should be used.

10 The e-learning system should be secured from tampering and attempts to hack into the system.

Guidance for assessing a trainee's progress and achievements by training by distance learning and e-learning

11 Each Party should ensure that approved assessment procedures are provided for any distance learning and e-learning programme, including:

- .1 clear information to the trainees on the way that tests and examinations are conducted and how the results are communicated;
- .2 have test questions that are comprehensive and will adequately assess a trainee's competence and are appropriate to the level being examined;
- .3 procedures in place to ensure questions are kept up to date and;
- .4 the conditions where the examinations can take place and the procedures for invigilation to be conducted;
- .5 secure procedures for the examination system so that it will prevent cheating; and
- .6 secure validation procedures to record results for the benefit of the Party.

Register of approved training providers, courses and programmes

12 Each Party should ensure that a register or registers of approved training providers, courses and programmes are maintained and made available to companies and other Parties on request.

Section B-I/12

Guidance regarding the use of simulators

1 When simulators are being used for training or assessment of competency, the following guidelines should be taken into consideration in conducting any such training or assessment.

Training and assessment in radar observation and plotting*

2 Training and assessment in radar observation and plotting should:

- .1 incorporate the use of radar simulation equipment; and
- .2 conform to standards not inferior to those given in paragraphs 3 to 17 below.

3 Demonstrations of and practice in radar observation should be undertaken, where appropriate, on live marine radar equipment, including the use of simulators. Plotting exercises should preferably be undertaken in real time, in order to increase trainees' awareness of the hazards of the improper use of radar data and improve their plotting techniques to a standard of radar plotting commensurate with that necessary for the safe execution of collision-avoidance manoeuvring under actual seagoing conditions.

General

Factors affecting performance and accuracy

4 An elementary understanding should be attained of the principles of radar, together with a full practical knowledge of:

- .1 range and bearing measurement, characteristics of the radar set which determine the quality of the radar display, radar antennae, polar diagrams, the effects of power radiated in directions outside the main beam, a non-technical description of the radar system, including variations in the features encountered in different types of radar set, performance monitors and equipment factors which affect maximum and minimum detection ranges and accuracy of information;
- .2 the current marine radar performance specification adopted by the Organization**;
- .3 the effects of the siting of the radar antenna, shadow sectors and arcs of reduced sensitivity, false echoes, effects of antenna height on detection ranges and of siting radar units and storing spares near magnetic compasses, including magnetic safe distances; and
- .4 radiation hazards and safety precautions to be taken in the vicinity of antennae and open waveguides.

Detection of misrepresentation of information, including false echoes and sea returns

5 A knowledge of the limitations to target detection is essential, to enable the observer to estimate the dangers of failure to detect targets. The following factors should be emphasized:

- .1 performance standard of the equipment;

* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

** See relevant/appropriate performance standards adopted by the Organization.

- .2 brilliance, gain and video processor control settings;
- .3 radar horizon;
- .4 size, shape, aspect and composition of targets;
- .5 effects of the motion of the ship in a seaway;
- .6 propagation conditions;
- .7 meteorological conditions; sea clutter and rain clutter;
- .8 anti-clutter control settings;
- .9 shadow sectors; and
- .10 radar-to-radar interference.

6 A knowledge should be attained of factors which might lead to faulty interpretation, including false echoes, effects of nearby pylons and large structures, effects of power lines crossing rivers and estuaries, echoes from distant targets occurring on second or later traces.

7 A knowledge should be attained of aids to interpretation, including corner reflectors and radar beacons; detection and recognition of land targets; the effects of topographical features; effects of pulse length and beam width; radar-conspicuous and -inconspicuous targets; factors which affect the echo strength from targets.

Practice

Setting up and maintaining displays

- 8 A knowledge should be attained of:
- .1 the various types of radar display mode; unstabilized ship's-head-up relative motion; ship's-head-up, course-up and north-up stabilized relative motion and true motion;
 - .2 the effects of errors on the accuracy of information displayed; effects of transmitting compass errors on stabilized and true-motion displays; effects of transmitting log errors on a true-motion display; and the effects of inaccurate manual speed settings on a true-motion display;
 - .3 methods of detecting inaccurate speed settings on true-motion controls; the effects of receiver noise limiting the ability to display weak echo returns, and the effects of saturation by receiver noise, etc.; the adjustment of operational controls; criteria which indicate optimum points of adjustment; the importance of proper adjustment sequence, and the effects of maladjusted controls; the detection of maladjustments and corrections of:
 - .3.1 controls affecting detection ranges; and
 - .3.2 controls affecting accuracy;
 - .4 the dangers of using radar equipment with maladjusted controls; and
 - .5 the need for frequent regular checking of performance, and the relationship of the performance indicator to the range performance of the radar set.

Range and bearing

- 9 A knowledge should be attained of:
- .1 the methods of measuring ranges; fixed range markers and variable range markers;
 - .2 the accuracy of each method and the relative accuracy of the different methods;
 - .3 how range data are displayed; ranges at stated intervals, digital counter and graduated scale;
 - .4 the methods of measuring bearings; rotatable cursor on transparent disc covering the display, electronic bearing cursor and other methods;
 - .5 bearing accuracy and inaccuracies caused by parallax, heading marker displacement, centre maladjustment;
 - .6 how bearing data are displayed; graduated scale and digital counter; and
 - .7 the need for regular checking of the accuracy of ranges and bearings, methods of checking for inaccuracies and correcting or allowing for inaccuracies.

Plotting techniques and relative-motion concepts

10 Practice should be provided in manual plotting techniques, including the use of reflection plotters, with the objective of establishing a thorough understanding of the interrelated motion between own ship and other ships, including the effects of manoeuvring to avoid collision. At the preliminary stages of this training, simple plotting exercises should be designed to establish a sound appreciation of plotting geometry and relative-motion concepts. The degree of complexity of exercises should increase throughout the training course until the trainee has mastered all aspects of the subject. Competence can best be enhanced by exposing the trainee to real-time exercises performed on a simulator or using other effective means.

Identification of critical echoes

- 11 A thorough understanding should be attained of:
- .1 position fixing by radar from land targets and sea marks;
 - .2 the accuracy of position fixing by ranges and by bearings;
 - .3 the importance of cross-checking the accuracy of radar against other navigational aids; and
 - .4 the value of recording ranges and bearings at frequent, regular intervals when using radar as an aid to collision avoidance.

Course and speed of other ships

- 12 A thorough understanding should be attained of:
- .1 the different methods by which course and speed of other ships can be obtained from recorded ranges and bearings, including:
 - .1.1 the unstabilized relative plot;

- .1.2 the stabilized relative plot; and
- .1.3 the true plot; and
- .2 the relationship between visual and radar observations, including detail and the accuracy of estimates of course and speed of other ships, and the detection of changes in movements of other ships.

Time and distance of closest approach of crossing, meeting or overtaking ships

13 A thorough understanding should be attained of:

- .1 the use of recorded data to obtain:
 - .1.1 measurement of closest approach distance and bearing;
 - .1.2 time to closest approach; and
- .2 the importance of frequent, regular observations.

Detecting course and speed changes of other ships

14 A thorough understanding should be attained of:

- .1 the effects of changes of course and/or speed by other ships on their tracks across the display;
- .2 the delay between change of course or speed and detection of that change; and
- .3 the hazards of small changes as compared with substantial changes of course or speed in relation to rate and accuracy of detection.

Effects of changes in own ship's course or speed or both

15 A thorough understanding of the effects on a relative-motion display of own ship's movements, and the effects of other ships' movements and the advantages of compass stabilization of a relative display.

16 In respect of true-motion displays, a thorough understanding should be attained of:

- .1 the effects of inaccuracies of:
 - .1.1 speed and course settings; and
 - .1.2 compass stabilization data driving a stabilized relative-motion display;
- .2 the effects of changes in course or speed or both by own ship on tracks of other ships on the display; and
- .3 the relationship of speed to frequency of observations.

Application of the International Regulations for Preventing Collisions at Sea, 1972, as amended

17 A thorough understanding should be attained of the relationship of the International Regulations for Preventing Collisions at Sea, 1972, as amended to the use of radar, including:

- .1 action to avoid collision, dangers of assumptions made on inadequate information and the hazards of small alterations of course or speed;
- .2 the advantages of safe speed when using radar to avoid collision;
- .3 the relationship of speed to closest approach distance and time and to the manoeuvring characteristics of various types of ships;
- .4 the importance of radar observation reports and radar reporting procedures being well defined;
- .5 the use of radar in clear weather, to obtain an appreciation of its capabilities and limitations, compare radar and visual observations and obtain an assessment of the relative accuracy of information;
- .6 the need for early use of radar in clear weather at night and when there are indications that visibility may deteriorate;
- .7 comparison of features displayed by radar with charted features; and
- .8 comparison of the effects of differences between range scales.

Training and assessment in the operational use of Automatic Radar Plotting Aids (ARPA)

18 Training and assessment in the operational use of automatic radar plotting aids (ARPA) should:

- .1 require prior completion of the training in radar observation and plotting or combine that training with the training given in paragraphs 19 to 35 below;*
- .2 incorporate the use of ARPA simulation equipment; and
- .3 conform to standards not inferior to those given in paragraphs 19 to 35 below.

19 Where ARPA training is provided as part of the general training under the 1978 STCW Convention, masters, chief mates and officers in charge of a navigational watch should understand the factors involved in decision-making based on the information supplied by ARPA in association with other navigational data inputs, having a similar appreciation of the operational aspects and of system errors of modern electronic navigational systems, including ECDIS. This training should be progressive in nature, commensurate with the responsibilities of the individual and the certificates issued by Parties under the 1978 STCW Convention.

Theory and demonstration

Possible risks of over-reliance on ARPA

20 Appreciation that ARPA is only a navigational aid and:

- .1 that its limitations, including those of its sensors, make over-reliance on ARPA dangerous, in particular for keeping a look-out; and

* The relevant IMO Model Course(s) and resolution MSC.64(67), as amended, may be of assistance in the preparation of courses.

- .2 the need to observe at all times the Principles to be observed in keeping a navigational watch and the Guidance on keeping a navigational watch.

Principal types of ARPA systems and their display characteristics

21 Knowledge of the principal types of ARPA systems in use; their various display characteristics and an understanding of when to use ground- or sea-stabilized modes and north-up, course-up or head-up presentations.

IMO performance standards for ARPA

22 An appreciation of the IMO performance standards for ARPA, in particular the standards relating to accuracy.*

Factors affecting system performance and accuracy

23 Knowledge of ARPA sensor input performance parameters – radar, compass and speed inputs and the effects of sensor malfunction on the accuracy of ARPA data.

24 Knowledge of:

- .1 the effects of the limitations of radar range and bearing discrimination and accuracy and the limitations of compass and speed input accuracies on the accuracy of ARPA data; and
- .2 factors which influence vector accuracy.

Tracking capabilities and limitations

25 Knowledge of:

- .1 the criteria for the selection of targets by automatic acquisition;
- .2 the factors leading to the correct choice of targets for manual acquisition;
- .3 the effects on tracking of “lost” targets and target fading; and
- .4 the circumstances causing “target swap” and its effects on displayed data.

Processing delays

26 Knowledge of the delays inherent in the display of processed ARPA information, particularly on acquisition and re-acquisition or when a tracked target manoeuvres.

Operational warnings, their benefits and limitations

27 Appreciation of the uses, benefits and limitations of ARPA operational warnings and their correct setting, where applicable, to avoid spurious interference.

* See relevant/appropriate performance standards adopted by the Organization.

System operational tests

28 Knowledge of:

- .1 methods of testing for malfunctions of ARPA systems, including functional self-testing; and
- .2 precautions to be taken after a malfunction occurs.

Manual and automatic acquisition of targets and their respective limitations

29 Knowledge of the limits imposed on both types of acquisition in multi-target scenarios, and the effects on acquisition of target fading and target swap.

True and relative vectors and typical graphic representation of target information and danger areas

30 Thorough knowledge of true and relative vectors; derivation of targets' true courses and speeds, including:

- .1 threat assessment, derivation of predicted closest point of approach and predicted time to closest point of approach from forward extrapolation of vectors, the use of graphic representation of danger areas;
- .2 the effects of alterations of course and/or speed of own ship and/or targets on predicted closest point of approach and predicted time to closest point of approach and danger areas;
- .3 the effects of incorrect vectors and danger areas; and
- .4 the benefit of switching between true and relative vectors.

Information on past positions of targets being tracked

31 Knowledge of the derivation of past positions of targets being tracked, recognition of historic data as a means of indicating recent manoeuvring of targets and as a method of checking the validity of the ARPA's tracking.

Practice

Setting up and maintaining displays

32 Ability to demonstrate:

- .1 the correct starting procedure to obtain the optimum display of ARPA information;
- .2 the selection of display presentation; stabilized relative-motion displays and true-motion displays;
- .3 the correct adjustment of all variable radar display controls for optimum display of data;
- .4 the selection, as appropriate, of required speed input to ARPA;

- .5 the selection of ARPA plotting controls, manual/automatic acquisition, vector/graphic display of data;
- .6 the selection of the timescale of vectors/graphics;
- .7 the use of exclusion areas when automatic acquisition is employed by ARPA; and
- .8 performance checks of radar, compass, speed input sensors and ARPA.

System operational tests

33 Ability to perform system checks and determine data accuracy of ARPA, including the trial manoeuvre facility, by checking against basic radar plot.

Obtaining information from the ARPA display

34 Demonstrate the ability to obtain information in both relative- and true-motion modes of display, including:

- .1 the identification of critical echoes;
- .2 the speed and direction of target's relative movement;
- .3 the time to, and predicted range at, target's closest point of approach;
- .4 the courses and speeds of targets;
- .5 detecting course and speed changes of targets and the limitations of such information;
- .6 the effect of changes in own ship's course or speed or both; and
- .7 the operation of the trial manoeuvre facility.

Application of the International Regulations for Preventing Collisions at Sea, 1972, as amended

35 Analysis of potential collision situations from displayed information, determination and execution of action to avoid close-quarters situations in accordance with the International Regulations for Preventing Collisions at Sea, 1972, as amended, in force.

Training and assessment in the operational use of Electronic Chart Display and Information Systems (ECDIS)

Introduction

36 When simulators are being used for training or assessment in the operational use of Electronic Chart Display and Information Systems (ECDIS), the following interim guidance should be taken into consideration in any such training or assessment.

37 Training and assessment in the operational use of the ECDIS should:

- .1 incorporate the use of ECDIS simulation equipment; and
- .2 conform to standards not inferior to those given in paragraphs 38 to 65 below.

38 ECDIS simulation equipment should, in addition to meeting all applicable performance standards set out in section A-I/12 of the STCW Code, as amended, be capable of simulating navigational equipment and bridge operational controls which meet all applicable performance standards adopted by the Organization, incorporate facilities to generate soundings and:

- .1 create a real-time operating environment, including navigation control and communications instruments and equipment appropriate to the navigation and watchkeeping tasks to be carried out and the manoeuvring skills to be assessed; and
- .2 realistically simulate “own ship” characteristics in open-water conditions, as well as the effects of weather, tidal stream and currents.

39 Demonstrations of, and practice in, ECDIS use should be undertaken, where appropriate, through the use of simulators. Training exercises should preferably be undertaken in real time, in order to increase trainees’ awareness of the hazards of the improper use of ECDIS. Accelerated timescale may be used only for demonstrations.

General

Goals of an ECDIS training programme

40 The ECDIS trainee should be able to:

- .1 operate the ECDIS equipment, use the navigational functions of ECDIS, select and assess all relevant information and take proper action in the case of a malfunction;
- .2 state the potential errors of displayed data and the usual errors of interpretation; and
- .3 explain why ECDIS should not be relied upon as the sole reliable aid to navigation.

Theory and demonstration

41 As the safe use of ECDIS requires knowledge and understanding of the basic principles governing ECDIS data and their presentation rules as well as potential errors in displayed data and ECDIS-related limitations and potential dangers, a number of lectures covering the theoretical explanation should be provided. As far as possible, such lessons should be presented within a familiar context and make use of practical examples. They should be reinforced during simulator exercises.

42 For safe operation of ECDIS equipment and ECDIS-related information (use of the navigational functions of ECDIS, selection and assessment of all relevant information, becoming familiar with ECDIS man-machine interfacing), practical exercises and training on the ECDIS simulators should constitute the main content of the course.

43 For the definition of training objectives, a structure of activities should be defined. A detailed specification of learning objectives should be developed for each topic of this structure.

Simulator exercises

44 Exercises should be carried out on individual ECDIS simulators, or full-mission navigation simulators including ECDIS, to enable trainees to acquire the necessary practical

skills. For real-time navigation exercises, navigation simulators are recommended to cover the complex navigation situation. The exercises should provide training in the use of the various scales, navigational modes, and display modes which are available, so that the trainees will be able to adapt the use of the equipment to the particular situation concerned.

45 The choice of exercises and scenarios is governed by the simulator facilities available. If one or more ECDIS workstations and a full-mission simulator are available, the workstations may primarily be used for basic exercises in the use of ECDIS facilities and for passage-planning exercises, whereas full-mission simulators may primarily be used for exercises related to passage-monitoring functions in real time, as realistic as possible in connection with the total workload of a navigational watch. The degree of complexity of exercises should increase throughout the training programme until the trainee has mastered all aspects of the learning subject.

46 Exercises should produce the greatest impression of realism. To achieve this, the scenarios should be located in a fictitious sea area. Situations, functions and actions for different learning objectives which occur in different sea areas can be integrated into one exercise and experienced in real time.

47 The main objective of simulator exercises is to ensure that trainees understand their responsibilities in the operational use of ECDIS in all safety-relevant aspects and are thoroughly familiar with the system and equipment used.

Principal types of ECDIS systems and their display characteristics

48 The trainee should gain knowledge of the principal types of ECDIS in use; their various display characteristics, data structure and an understanding of:

- .1 differences between vector and raster charts;
- .2 differences between ECDIS and ECS;
- .3 differences between ECDIS and RCDS*;
- .4 characteristics of ECDIS and their different solutions; and
- .5 characteristics of systems for special purposes (unusual situations/emergencies).

Risks of over-reliance on ECDIS

49 The training in ECDIS operational use should address:

- .1 the limitations of ECDIS as a navigational tool;
- .2 potential risk of improper functioning of the system;
- .3 system limitations, including those of its sensors;
- .4 hydrographic data inaccuracy; limitations of vector and raster electronic charts (ECDIS vs RCDS and ENC vs RNC); and
- .5 potential risk of human errors.

* SN/Circ.207/Rev.1 – Differences between RCDS and ECDIS.

Emphasis should be placed on the need to keep a proper look-out and to perform periodical checking, especially of the ship's position, by ECDIS-independent methods.

Detection of misrepresentation of information

50 Knowledge of the limitations of the equipment and detection of misrepresentation of information is essential for the safe use of ECDIS. The following factors should be emphasized during training:

- .1 performance standards of the equipment;
- .2 radar data representation on an electronic chart, elimination of discrepancy between the radar image and the electronic chart;
- .3 possible projection discrepancies between an electronic and paper charts;
- .4 possible scale discrepancies (overscaling and underscaling) in displaying an electronic chart and its original scale;
- .5 effects of using different reference systems for positioning;
- .6 effects of using different horizontal and vertical datums;
- .7 effects of the motion of the ship in a seaway;
- .8 ECDIS limitations in raster chart display mode;
- .9 potential errors in the display of:
 - .9.1 the own ship's position;
 - .9.2 radar data and ARPA and AIS information;
 - .9.3 different geodetic coordinate systems; and
- .10 verification of the results of manual or automatic data correction:
 - .10.1 comparison of chart data and radar picture; and
 - .10.2 checking the own ship's position by using the other independent position-fixing systems.

51 False interpretation of the data and proper action taken to avoid errors of interpretation should be explained. The implications of the following should be emphasized:

- .1 ignoring overscaling of the display;
- .2 uncritical acceptance of the own ship's position;
- .3 confusion of display mode;
- .4 confusion of chart scale;
- .5 confusion of reference systems;
- .6 different modes of presentation;

- .7 different modes of vector stabilization;
- .8 differences between true north and gyro north (radar);
- .9 using the same data reference system;
- .10 using the appropriate chart scale;
- .11 using the best-suited sensor to the given situation and circumstances;
- .12 entering the correct values of safety data:
 - .12.1 the own ship's safety contour,
 - .12.2 safety depth (safe water), and
 - .12.3 events; and
- .13 proper use of all available data.

52 Appreciation that RCDS is only a navigational aid and that, when operating in the RCDS mode, the ECDIS equipment should be used together with an appropriate portfolio of up-to-date paper charts:

- .1 appreciation of the differences in operation of RCDS mode as described in SN.1/Circ.207/Rev.1 "Differences between RCDS and ECDIS"; and
- .2 ECDIS, in any mode, should be used in training with an appropriate portfolio of up-to-date charts.

Factors affecting system performance and accuracy

53 An elementary understanding should be attained of the principles of ECDIS, together with a full practical knowledge of:

- .1 starting and setting up ECDIS; connecting data sensors: satellite and radio navigation system receivers, radar, gyro-compass, log, echo-sounder; accuracy and limitations of these sensors, including effects of measurement errors and ship's position accuracy, manoeuvring on the accuracy of course indicator's performance, compass error on the accuracy of course indication, shallow water on the accuracy of log performance, log correction on the accuracy of speed calculation, disturbance (sea state) on the accuracy of an echo-sounder performance; and
- .2 the current performance standards for electronic chart display and information systems adopted by the Organization*.

* See relevant/appropriate performance standards adopted by the Organization.

Practice

Setting up and maintaining display

- 54** Knowledge and skills should be attained in:
- .1 the correct starting procedure to obtain the optimum display of ECDIS information;
 - .2 the selection of display presentation (standard display, display base, all other information displayed individually on demand);
 - .3 the correct adjustment of all variable radar/ARPA display controls for optimum display of data;
 - .4 the selection of convenient configuration;
 - .5 the selection, as appropriate, of required speed input to ECDIS;
 - .6 the selection of the timescale of vectors; and
 - .7 performance checks of position, radar/ARPA, compass, speed input sensors and ECDIS.

Operational use of electronic charts

- 55** Knowledge and skills should be attained in:
- .1 the main characteristics of the display of ECDIS data and selecting proper information for navigational tasks;
 - .2 the automatic functions required for monitoring ship's safety, such as display of position, heading/gyro course, speed, safety values and time;
 - .3 the manual functions (by the cursor, electronic bearing line, range rings);
 - .4 selecting and modification of electronic chart content;
 - .5 scaling (including underscaling and overscaling);
 - .6 zooming;
 - .7 setting of the own ship's safety data;
 - .8 using a daytime or night-time display mode;
 - .9 reading all chart symbols and abbreviations;
 - .10 using different kinds of cursors and electronic bars for obtaining navigational data;
 - .11 viewing an area in different directions and returning to the ship's position;
 - .12 finding the necessary area, using geographical coordinates;
 - .13 displaying indispensable data layers appropriate to a navigational situation;

- .14 selecting appropriate and unambiguous data (position, course, speed, etc.);
- .15 entering the mariner's notes;
- .16 using north-up orientation presentation and other kinds of orientation; and
- .17 using true- and relative-motion modes.

Route planning

56 Knowledge and skills should be attained in:

- .1 loading the ship's characteristics into ECDIS;
- .2 selection of a sea area for route planning:
 - .2.1 reviewing required waters for the sea passage, and
 - .2.2 changing over of chart scale;
- .3 verifying that proper and updated charts are available;
- .4 route planning on a display by means of ECDIS, using the graphic editor, taking into consideration rhumb line and great-circle sailing:
 - .4.1 using the ECDIS database for obtaining navigational, hydro-meteorological and other data;
 - .4.2 taking into consideration turning radius and wheel-over points/lines when they are expressed on chart scale;
 - .4.3 marking dangerous depths and areas and exhibiting guarding depth contours;
 - .4.4 marking waypoints with the crossing depth contours and critical cross-track deviations, as well as by adding, replacing and erasing of waypoints;
 - .4.5 taking into consideration safe speed;
 - .4.6 checking pre-planned route for navigational safety; and
 - .4.7 generating alarms and warnings;
- .5 route planning with calculation in the table format, including:
 - .5.1 waypoints selection;
 - .5.2 recalling the waypoints list;
 - .5.3 planning notes;
 - .5.4 adjustment of a planned route;
 - .5.5 checking a pre-planned route for navigational safety;

- .5.6 alternative route planning;
- .5.7 saving planned routes, loading and unloading or deleting routes;
- .5.8 making a graphic copy of the monitor screen and printing a route;
- .5.9 editing and modification of the planned route;
- .5.10 setting of safety values according to the size and manoeuvring parameters of the vessel;
- .5.11 back-route planning; and
- .5.12 connecting several routes.

Route monitoring

57 Knowledge and skills should be attained in:

- .1 using independent data to control ship's position or using alternative systems within ECDIS;
- .2 using the look-ahead function:
 - .2.1 changing charts and their scales;
 - .2.2 reviewing navigational charts;
 - .2.3 vector time selecting;
 - .2.4 predicting the ship's position for some time interval;
 - .2.5 changing the pre-planned route (route modification);
 - .2.6 entering independent data for the calculation of wind drift and current allowance;
 - .2.7 reacting properly to the alarm;
 - .2.8 entering corrections for discrepancies of the geodetic datum;
 - .2.9 displaying time markers on a ship's route;
 - .2.10 entering ship's position manually; and
 - .2.11 measuring coordinates, course, bearings and distances on a chart.

Alarm handling

58 Knowledge and ability to interpret and react properly to all kinds of systems, such as navigational sensors, indicators, data and charts alarms and indicator warnings, including, switching the sound and visual alarm signalling system, should be attained in case of:

- .1 absence of the next chart in the ECDIS database;
- .2 crossing a safety contour;

- .3 exceeding cross-track limits;
- .4 deviation from planned route;
- .5 approaching a waypoint;
- .6 approaching a critical point;
- .7 discrepancy between calculated and actual time of arrival to a waypoint;
- .8 information on under-scaling or over-scaling;
- .9 approaching an isolated navigational danger or danger area;
- .10 crossing a specified area;
- .11 selecting a different geodetic datum;
- .12 approaching other ships;
- .13 watch termination;
- .14 switching timer;
- .15 system test failure;
- .16 malfunctioning of the positioning system used in ECDIS;
- .17 failure of dead-reckoning; and
- .18 inability to fix vessel's position using the navigational system.

Manual correction of a ship's position and motion parameters

59 Knowledge and skills should be attained in manually correcting:

- .1 the ship's position in dead-reckoning mode, when the satellite and radio navigation system receiver is switched off;
- .2 the ship's position, when automatically obtained coordinates are inaccurate; and
- .3 course and speed values.

Records in the ship's log

60 Knowledge and skills should be attained in:

- .1 automatic voyage recording;
- .2 reconstruction of past track, taking into account:
 - .2.1 recording media;
 - .2.2 recording intervals;
 - .2.3 verification of database in use;

- .3 viewing records in the electronic ship's log;
- .4 instant recording in the electronic ship's log;
- .5 changing ship's time;
- .6 entering the additional data;
- .7 printing the content of the electronic ship's log;
- .8 setting up the automatic record time intervals;
- .9 composition of voyage data and reporting; and
- .10 interface with a voyage data recorder (VDR).

Chart updating

61 Knowledge and skills should be attained in:

- .1 performing manual updating of electronic charts. Special attention should be paid to reference-ellipsoid conformity and to conformity of the measurement units used on a chart and in the correction text;
- .2 performing semi-automatic updating of electronic charts, using the data obtained on electronic media in the electronic chart format; and
- .3 performing automatic updating of electronic charts, using update files obtained via electronic data communication lines.

In the scenarios where non-updated data are employed to create a critical situation, trainees should be required to perform *ad hoc* updating of the chart.

Operational use of ECDIS where radar/ARPA is connected

62 Knowledge and skills should be attained in:

- .1 connecting ARPA to ECDIS;
- .2 indicating target's speed vectors;
- .3 indicating target's tracks;
- .4 archiving target's tracks;
- .5 viewing the table of the targets;
- .6 checking alignment of radar overlay with charted geographic features;
- .7 simulating one or more manoeuvres;
- .8 corrections to own ship's position, using a reference point captured by ARPA; and
- .9 corrections using the ARPA's cursor and electronic bar.

See also section B-I/12, Guidance regarding the use of simulators (pertaining to radar and ARPA), especially paragraphs 17 to 19 and 36 to 38.

Operational use of ECDIS where AIS is connected

63 Knowledge and skills should be attained in:

- .1 interface with AIS;
- .2 interpretation of AIS data;
- .3 indicating target's speed vectors;
- .4 indicating target's tracks; and
- .5 archiving target's tracks.

Operational warnings, their benefits and limitations

64 Trainees should gain an appreciation of the uses, benefits and limitations of ECDIS operational warnings and their correct setting, where applicable, to avoid spurious interference.

System operational tests

65 Knowledge and skills should be attained in:

- .1 methods of testing for malfunctions of ECDIS, including functional self-testing;
- .2 precautions to be taken after a malfunction occurs; and
- .3 adequate back-up arrangements (take over and navigate using the back-up system).

Debriefing exercise

66 The instructor should analyze the results of all exercises completed by all trainees and print them out. The time spent on the debriefing should occupy between 10% and 15% of the total time used for simulator exercises.

Recommended performance standards for non-mandatory types of simulation

67 Performance standards for non-mandatory simulation equipment used for training and/or assessment of competence or demonstration of skills are set out hereunder. Such forms of simulation include, but are not limited to, the following types:

- .1 navigation and watchkeeping;
- .2 ship handling and manoeuvring;
- .3 cargo handling and stowage;
- .4 reporting and radiocommunications; and
- .5 main and auxiliary machinery operation.

Navigation and watchkeeping simulation

68 Navigation and watchkeeping simulation equipment should, in addition to meeting all applicable performance standards set out in section A-I/12, be capable of simulating navigational equipment and bridge operational controls which meet all applicable performance standards adopted by the Organization,^{*} incorporate facilities to generate soundings and:

- .1** create a real-time operating environment, including navigation control and communications instruments and equipment appropriate to the navigation and watchkeeping tasks to be carried out and the manoeuvring skills to be assessed;
- .2** provide a realistic visual scenario by day or by night, including variable visibility, or by night only as seen from the bridge, with a minimum horizontal field of view available to the trainee in viewing sectors appropriate to the navigation and watchkeeping tasks and objectives;
- .3** realistically simulate “own ship” dynamics in open-water conditions, including the effects of weather, tidal stream, currents and interaction with other ships; and
- .4** realistically simulate VTS communication procedures between ship and shore.

Ship handling and manoeuvring simulation

69 In addition to meeting the performance standards set out in paragraph 37, ship handling simulation equipment should:

- .1** provide a realistic visual scenario as seen from the bridge, by day and by night, with variable visibility throughout a minimum horizontal field of view available to the trainee in viewing sectors appropriate to the ship handling and manoeuvring training tasks and objectives;^{**} and
- .2** realistically simulate “own ship” dynamics in restricted waterways, including shallow-water and bank effects.

70 Where manned scale models are used to provide ship handling and manoeuvring simulation, in addition to the performance standards set out in paragraphs 68.3 and 69.2, such equipment should:

- .1** incorporate scaling factors which present accurately the dimensions, areas, volume and displacement, speed, time and rate of turn of a real ship; and
- .2** incorporate controls for the rudder and engines, to the correct timescale.

Cargo handling and stowage simulation

71 Cargo handling simulation equipment should be capable of simulating cargo handling and control equipment which meets all applicable performance standards adopted by the Organization^{***} and incorporate facilities to:

^{*} See relevant/appropriate performance standards adopted by the Organization.

^{**} The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

^{***} No standards have as yet been adopted by the Organization.

- .1 create an effective operational environment, including a cargo-control station with such instrumentation as may be appropriate to the particular type of cargo system modelled;
- .2 model loading and unloading functions and stability and stress data appropriate to the cargo-handling tasks to be carried out and the skills to be assessed; and
- .3 simulate loading, unloading, ballasting and deballasting operations and appropriate associated calculations for stability, trim, list, longitudinal strength, torsional stress and damage stability*.

GMDSS communication simulation

72 GMDSS communication simulation equipment should be capable of simulating GMDSS communication equipment which meets all applicable performance standards adopted by the Organization** and incorporate facilities to:

- .1 simulate the operation of VHF, VHF-DSC, NAVTEX, EPIRB and watch receiver equipment as required for the Restricted Operator's Certificate (ROC);
- .2 simulate the operation of INMARSAT-A, -B and -C ship earth stations, MF/HF NBDP, MF/HF-DSC, VHF, VHF-DSC, NAVTEX, EPIRB and watch receiver equipment as required for the General Operator's Certificate (GOC);
- .3 provide voice communication with background noise;
- .4 provide a printed text communication facility; and
- .5 create a real-time operating environment, consisting of an integrated system, incorporating at least one instructor/assessor station and at least two GMDSS ship or shore stations.

Main and auxiliary machinery operation simulation

73 Engine-room simulation equipment should be capable of simulating a main and auxiliary machinery system and incorporate facilities to:

- .1 create a real-time environment for seagoing and harbour operations, with communication devices and simulation of appropriate main and auxiliary propulsion machinery equipment and control panels;
- .2 simulate relevant sub-systems that should include, but not be restricted to, boiler, steering gear, electrical power general and distribution systems, including emergency power supplies, and fuel, cooling water, refrigeration, bilge and ballast systems;
- .3 monitor and evaluate engine performance and remote sensing systems;
- .4 simulate machinery malfunctions;
- .5 allow for the variable external conditions to be changed so as to influence the simulated operations: weather, ship's draught, seawater and air temperatures;

* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

** See relevant/appropriate performance standards adopted by the Organization.

- .6 allow for instructor-controlled external conditions to be changed: deck steam, accommodation steam, deck air, ice conditions, deck cranes, heavy power, bow thrust, ship load;
- .7 allow for instructor-controlled simulator dynamics to be changed: emergency run, process responses, ship responses; and
- .8 provide a facility to isolate certain processes, such as speed, electrical system, diesel oil system, lubricating oil system, heavy oil system, seawater system, steam system, exhaust boiler and turbo generator, for performing specific training tasks.*

* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.