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NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 8 02

Subj: GUIDELINES FOR ASSESSING MERCHANT MARINERS THROUGH DEMONSTRATIONS OF PROFICIENCY AS OFFICERS IN CHARGE OF A NAVIGATIONAL WATCH ON SHIPS OF 500 GROSS TONNAGE OR MORE AS MEASURED UNDER THE INTERNATIONAL TONNAGE CONVENTION (ITC)

Ref: (a) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW), Regulation II/1 and Section A-II/1 of STCW Code, incorporated into regulations at 46 CFR 10.102(b)
(b) Federal Register dated August 22, 2000, Docket No. USCG-2000-7693, Guidelines for Assessing Merchant Mariners Through Demonstrations of Proficiency as Officers in Charge of Navigational Watches on Ships of 500 Gross Tonnage or More as Measured Under the International Tonnage Convention (ITC)
(c) Guidelines for Assessing Merchant Mariners Through Demonstrations of Proficiency as Officers in Charge of Navigational Watches on Ships of 500 Gross Tonnage or More as Measured Under the International Tonnage Convention (ITC), Docket No. USCG-2000-7693, Available at: http://dms.dot.gov

1. PURPOSE. This Circular provides the national guidelines for the assessment of a seafarer's practical proficiency through demonstrations of skills of an applicant for an STCW certificate as an Officer in Charge of a Navigational Watch on Ships of 500 Gross Tonnage or More as Measured Under the International Tonnage Convention (ITC). These guidelines are for use in training programs approved or accepted by the U. S. Coast Guard as meeting reference (a) and by designated examiners (DEs) when carrying out their assessment activities.

2. ACTION. Officers in Charge, Marine Inspection (OCMIs), should use this Circular when establishing that a candidate is entitled to hold an STCW-95 certificate as an Officer in

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Charge of a Navigational Watch on Ships of 500 Gross Tonnage or More as Measured Under the ITC. OCMIs should also bring this Circular to the attention of the appropriate people in the maritime industry within their zones. This Circular is available on the World Wide Web at **http://www.uscg.mil/hq/g-m/nvic/**. Within the Coast Guard, it will be distributed by electronic means only.

3. DIRECTIVES AFFECTED. None.

4. BACKGROUND.

   a. The guidance from the International Maritime Organization (IMO) on shipboard assessments of proficiency, MSC/Circular 853, suggests that administrations should develop standards and measures of performance for practical tests as part of a program of training and assessment of mariners. These standards and measures ensure the uniform assessment of mariners without regard to individuality of the DEs and will result in standardization, fairness, and consistency. Enclosure (1) provides an overview of the Coast Guard's policy on assessments of mariners as required by the STCW.

   b. The Coast Guard tasked the Merchant Marine Personnel Advisory Committee (MERPAC) to recommend national criteria for a mariner's certification as an Officer in Charge of a Navigational Watch on Ships of 500 Gross Tonnage or More as Measured Under the ITC. The National Maritime Center (NMC) then used MERPAC's criteria to develop proposed national guidelines, which we published for public comment in references (b) and (c). Comments from the public may be found in attachments (3), (4), and (5) of reference (c). After consideration of the public's comments, the NMC developed the final version of the national assessments, which appear in enclosure (2). MERPAC's criteria included "knowledge" competencies that did not appear in the national guidelines. These focus solely on the practical demonstrations of a mariner's competency. Persons or organizations who submitted comments to the docket and who would like further information on the response to their comments should write to the National Maritime Center at 4200 Wilson Boulevard, Suite 630, Arlington, VA 22203.

5. DISCUSSION.

   a. Any mariner who commences training or sea service required by the STCW on or after August 1, 1998, or any mariner applying for STCW certification as an Officer in Charge of a Navigational Watch on Ships of 500 Gross Tonnage or More as Measured Under the ITC on or after February 1, 2002, is required by 46 CFR 10.901(c) to present documentation demonstrating competence in those skills specified in the table of enclosure (2). The practical demonstrations of skills are required by 10.205(p) to be completed in the presence of, and certified by, a DE. Unless a mariner demonstrates proficiency in the skills required of an Officer in Charge of a Navigational Watch on Ships of 500 Gross Tonnage or More as Measured Under the ITC in enclosure (2), the OCMI will not issue the STCW certificate.

   b. A person assessing a mariner under STCW for practical proficiency as an Officer in Charge of a Navigational Watch on Ships of 500 Gross Tonnage or More as Measured

Under the ITC should use either the guidelines in enclosure (2) or an alternative as discussed in paragraph 5.c.

c. Those who assess the practical proficiency of mariners may refine these published guidelines and develop innovative alternatives; however, before they use them, they must submit them to the NMC for approval by the Coast Guard. A training institution submitting a course that leads to certification as an Officer in Charge of a Navigational Watch on Ships of 500 Gross Tonnage or More as Measured Under the ITC should either state that the guidelines in enclosure (2) will apply or otherwise identify the guidelines to be used.

d. Merchant mariners required to demonstrate proficiency through demonstrations of skills for an Officer in Charge of a Navigational Watch on Ships of 500 Gross Tonnage or More as Measured Under ITC are encouraged to use these guidelines for self-study and self-assessment.

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Encl: (1) Assessments of Mariners
(2) Assessment Guidelines for Table A-II/1, Proficiency as Officer in Charge of a Navigational Watch on Ships of 500 gross tonnage or more

Non-Standard Distribution:

B:a G-M(1); G-MS(1); G-MSO (4)

D:l CG Liaison Officer MILSEALIFTCOMD (Code N-7CG) (1); CG Liaison Officer MARAD (MAR-720.2) (1).

ASSESSMENTS OF MARINERS

1. ASSESSMENT OF SKILLS.

a. Any mariner who commences training or sea service required by the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW), on or after August 1, 1998, or any mariner who applies for STCW certification as an officer in charge of a navigational watch on ships of 500 gross tonnage or more as measured under the International Tonnage Convention on or after February 1, 2002, must demonstrate to a designated examiner (DE) minimum competency in certain knowledge, understandings, and proficiencies. Without evidence to this effect, no endorsement will be issued.

b. Traditionally, in the United States, the Coast Guard has measured mariners' competency through assessments of knowledge. Knowledge-based components of this competency usually involve the recalling of facts or concepts, and written examinations are normally valid and reliable instruments for assessing such components. Historically, the Coast Guard has issued licenses and documents based predominantly on written essay and multiple-choice examinations. Currently, the Coast Guard employs a bank of over 25,000 multiple-choice questions to examine mariners.

c. Assessment of understanding is more complex than assessment of knowledge. Understanding involves specific principles and information processes necessary to analyze alternatives, make conclusions, make choices and decisions, or affect outcomes. Because it is a covert characteristic, understanding must be ascertained through assessment of an overt behavior that demonstrates understanding. Ascertainment can employ a variety of mechanisms, ranging from written problems involving calculations or analysis of facts to practical demonstrations requiring diagnostic or analytical reasoning. Many of the Coast Guard's 25,000 written questions for multiple-choice examinations involve problems that assess an understanding; but, in many instances, complete understanding is best measured through actual assessment of a mariner's performance.

d. Guidance provided by the IMO on certain assessments of proficiency requires development of standards and measures of performance for practical tests as part of seafarers' training programs. This is a new requirement for many flag-state administrations and their maritime industries. Performance assessment is part of a larger, well-established body of knowledge called instructional system design (ISD). Within this body, assessment methodologies range from the simple and straightforward to the complex and difficult. For the purposes of STCW, the Coast Guard believes the simplest and most straightforward approach works best and has decided to develop a set of national guidelines. In these, a performance standard has three components: the condition, the

behavior, and the criteria. The first establishes the conditions under which the candidate must demonstrate the knowledge, understanding, or proficiency. The second specifies the precise set of knowledge, understandings, or skills (the 'behaviors') that must be recalled, demonstrated, or performed. The third is the particular acts against which we measure an applicant's behavior to determine whether the performance can be considered minimally competent.

e. The third component is normally expressed in terms of "measures" or combinations of "measures," such as a time limit or requirement, a specific sequence, a number or a percentage, a tolerance, or a degree of conformance or accuracy required. For highly critical skills, the criteria may require precise answers, require exact sequences of actions, or have very small tolerances of errors or degrees of conformance. For instance, missing just one step of a sequence may constitute failure because that step was critical to achieving the final outcome. In less-critical skills, wider tolerances or degrees of conformance may pass; however, in every case the applicant must demonstrate at least the minimal level of competence set forth in the criteria.

2. DEVELOPMENT OF STANDARDS.

a. While the STCW Code gives broad guidance on the standards of performance and methods of assessment, the responsibility for the development of specific performance standards for each competency lies with the training provider. Development of valid and reliable performance standards is a resource-intensive effort. To minimize cost to the industry, promote uniformity, expedite the development process, and provide valid examples of these new performance standards, the Coast Guard asked that MERPAC develop recommendations for a set of these standards.

b. MERPAC developed the core elements of a set of these standards and forwarded them to the Coast Guard. We reviewed the initial recommendations and compared them to the requirements of the STCW. We incorporated the final products into the proposed national assessment guidelines and published them in the Federal Register for public comments. After considering the comments, we have made them the standards for identifying minimum levels of competence during demonstrations of a mariner's proficiency.

c. We encourage companies and maritime training institutions to use the national guidelines for assessment of STCW proficiencies in training programs submitted for our approval or for acceptance by a recognized quality-standards system. They should use them during STCW proficiency assessments conducted by their DEs. They may develop alternative assessment standards; however, they may not use these in

accepted or approved training programs until we have reviewed and approved them.

3. WRITTEN EXAMINATIONS.

a. Written examinations used in training programs under the STCW deserve particular emphasis. Companies and maritime training institutions should review their written instruments for assessing each knowledge-based and understanding-based competency from the STCW to ensure they include at least one question for each competency in the appropriate table from Part A of the STCW Code.

b. Companies and maritime training institutions should also have multiple questions for addressing each knowledge-based and understanding-based competency from the STCW to afford candidates a fair opportunity to demonstrate minimum ability. If only one question assessed a required knowledge or understanding, an incorrect answer would constitute a failure to have demonstrated the knowledge or understanding and would leave the candidate ineligible to have that competency certified by the DE, unless the DE used an alternative method. Accordingly, it would be preferable for the assessment to contain several questions. For example, in a written multiple-choice examination, if four questions concerned the same critical knowledge, three correct answers and one incorrect answer would meet the requirements for minimum competency if the performance standard was a 70% score. In this case the mariner would qualify as competent for that knowledge.

Assessment Guidelines for TABLE A-II/1

Specification for minimum standard of competency

Proficiency as Officer in Charge of a Navigational Watch on Ships of 500 gross tonnage or more

Candidates for a certificate as an officer in charge of a navigational watch on ships of 500 gross tonnage or more must meet the standards of competence set out in STCW Code Table A-II/1. In order to accomplish this, candidates must:

- Complete approved education and training and meet all the competencies listed in the table;
- Pass a written examination for the knowledge and understanding portion of those competencies; and
- Successfully accomplish a practical demonstration of skill for selected competencies.

Written Assessments

Assessments by written examination are required for: Rules of the Road; Celestial Navigation; Terrestrial Navigation; Electronic Navigation and Position System; Echo Sounders; Magnetic and Gyro-compasses; Steering Control Systems; Meteorology; Watchkeeping, including Bridge Resource Management and Voyage Planning; Radar Navigation; ARPA; Emergency Procedures; Search and Rescue; Visual Signaling; Ship Handling; Cargo Handling and Stowage; Pollution Prevention; Ship Stability; Fire Fighting and Fire Prevention; Life Saving; Medical First Aid; and IMO Conventions concerning Safety of Life at Sea. The candidate must achieve at least a grade of 70% in each area of knowledge or understanding within the competency, except for Rules of the Road, which he or she must complete with a passing grade of 90%.

Training and Assessment in Radar and ARPA must include successful completion of approved simulator courses and in-service experience. Training and assessment in Medical First Aid, Fire Prevention and Fire Fighting, Advanced Fire Fighting, and Crowd Management and Passenger Safety for passenger ships may be satisfied by attending independent courses that are approved or accepted by the Coast Guard as meeting the requirements of the STCW. These guidelines contain assessment criteria for some of these subjects. The Coast Guard will grant approval for these courses only if they use the relevant national assessment criteria or their

equivalents in their courses to assess practical demonstrations of skill. The candidate must achieve a minimum-passing grade of 70% in each area of knowledge or understanding within the competency.

The knowledge- or understanding-based portion of the following competencies may be assessed through a written multiple-choice examination. The candidate must achieve a minimum-passing grade of 70% in each area of knowledge or understanding within the competency.

1. Plan and conduct a passage and determine position;
2. Maintain a safe navigational watch;
3. Use radar and ARPA to maintain safety of navigation;
4. Respond to emergencies;
5. Respond to a distress signal at sea;
6. Use the standard marine navigation vocabulary as replaced by the IMO standard marine communication phrases and use English in written and oral form;
7. Transmit and receive information by visual signaling;
8. Maneuver the ship;
9. Monitor the loading, stowage, securing, and unloading of cargoes and their care during the voyage;
10. Ensure compliance with pollution-prevention requirements;
11. Maintain seaworthiness of the ship;
12. Prevent, control, and fight fires on board;
13. Operate life-saving appliances;
14. Apply medical first-aid on ship, and
15. Monitor compliance with legislative requirements.

Practical Demonstrations of Skill

The assessment criteria that follow identify those skills in Table A-II/1 that must be demonstrated: Plan and conduct a passage and determine position; Maintain a safe navigational watch; Use radar and ARPA to maintain safety of navigation; and Maneuver the ship. These assessment guidelines establish the conditions under which the assessment will occur, the performance or behavior the candidate is to accomplish, and the standards against which the performance is measured. The examiner is encouraged to use a checklist in conducting assessments of practical demonstrations of skill. Checklists allow a training institution or designated examiner

to ensure that critical tasks are not overlooked when evaluating a candidate's practical demonstration. Training institutions and designated examiners should develop their own checklists for use in conducting the assessments in a complete and structured manner.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
Plan and conduct a passage and determine position.	***Celestial Navigation**** *Ability to use celestial bodies to determine the ship's position** Adjust a sextant. Note 1	Given a standard marine sextant with a perpendicularity error, side error, parallelism error, and collimation error, totaling no more than 2′ and a clear or sharply defined cloudy horizon,	the candidate will remove the adjustable sextant errors.	1. The candidate removes the errors in the following order: a. Perpendicularity; b. Side error; c. Parallelism; and d. Collimation error. 2. The candidate's remaining index error is less than 0.5 minutes of arc as determined by the assessor.
	*Ability to use celestial bodies to determine the ship's position** Measure the altitude of the sun. Note 1	Aboard a ship or on shore, given a standard marine sextant, a clear horizon, a visible sun, and an accurate time,	the candidate will measure the altitude of the lower limb of the sun and accurately record the time of the observation.	The candidate's: 1. altitude is within ±0.5 minutes of arc, after correction for index error, compared with the assessor's solution; and 2. time is within ± 2 seconds of the assessor's solution.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	*Ability to use celestial bodies to determine the ship's position** Measure the altitude of at least 3 stars Note 1	Aboard a ship or on shore, given a standard marine sextant, a clear horizon, a clear or partly cloudy sky, and an accurate time, during a single twilight,	the candidate will measure the altitude of three stars and accurately record the times of the observation of each star.	The candidate's: 1. altitude is within ±0.5 minutes of arc, after correction for index error, compared with the assessor's solution; and 2. time is ± 2 seconds of UTC of the assessor's solution.
	*Ability to use celestial bodies to determine the ship's position** Measure the altitude of the sun at meridian passage (local apparent noon). Note 1	Aboard a ship or on shore, given a standard marine sextant, a clear horizon, and a clear or partly cloudy sky,	the candidate will measure the altitude of the sun as it transits the meridian on which the vessel is located.	The candidate's altitude is within ±0.5 minutes of arc, after correction for index error, of the assessor's solution measured at meridian passage.
	*Ability to use celestial bodies to determine the ship's position**	Aboard a ship at sea, or in a navigation laboratory, when given assumed positions,	the candidate will advance all three lines of position to a	The candidate's position of the running fix is within 1 nm of the assessor's solution.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	(cont'd) Celestial running fix Note 1	(cont'd) intercepts, azimuths, times of three observations of the sun, and a standard plotting sheet appropriate for the dead reckoning position,	(cont'd) common time.	
	Ability to use celestial bodies to determine the *ship's position** Star fix Note 1	Aboard a ship at sea, or in a navigation laboratory, when given the assumed positions, intercepts, azimuths, and times of three star observations, and on a standard plotting sheet appropriate for the dead reckoning position,	the candidate will plot the three lines of position and advance them to a common time.	The candidate's position of the star fix is within 1 nm of the assessor's solution.
	Terrestrial and coastal navigation* *Ability to determine the ship's position by use of:*	On a ship underway, or on a full-mission ship simulator, with land and aids to navigation in sight, using a standard bearing circle, alidade, or other device for taking bearings, and	the candidate will determine the bearings of at least two charted objects and plot them.	The candidate's: 1. position is within ±0.1 nm of the assessor's solution; 2. crossing angles of bearings are not less than 30° nor more than 160° between bearings; 3. bearings of objects abeam or close

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	(cont'd) *.1 landmarks.* *.2 aids to navigation, including lighthouses, beacons and navigational structures.**	(cont'd) given a chart with a scale of no more than 1:150,000,		(cont'd) to the beam are observed first; and 4. chart in use is the largest scale suitable for the waters being transited.
	*Ability to determine the ship's position by use of Marine Radar**	On an operational marine radar or a radar simulator that meets applicable national and international performance standards, with land and navigational aids displayed, and given a chart with a scale of no more than 1:150,000,	the candidate will determine two or more ranges measured from identified charted objects or points of land and plot them.	The candidate's position is within ± 0.1 nm of the assessor's solution.
	*Ability to determine the ship's position by use** of Marine Radar	On an operational marine radar or a radar simulator that meets applicable national and international performance standards,	the candidate will determine two or more tangents measured from identified-charted objects or points of land and plot	The candidate's position is within ± 0.1 nm of the assessor's solution.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) with land and navigational aids displayed, and given a chart with a scale of no more than 1:150,000,	(cont'd) them.	
	*Ability to determine the ship's position by use** of Dead Reckoning	On a ship underway or a full-mission ship simulator and using a standard plotting sheet or chart, and given the vessel's speed made good and course made good for the past four hours,	the candidate will plot the ship's DR position for every hour (or more frequently if required) for the duration of the watch.	The candidate's position is within ± 1 nm of the assessor's solution.
	*Ability to determine the ship's position by use** of Set and Drift	On a ship underway, or on a full-mission ship simulator, with the ship's speed of at least 10 knots, and using a plotting sheet or chart, when encountering wind and current which set the vessel,	the candidate will plot the vessel's position on at least two successive occasions not less than 30 minutes apart, calculate set and drift by vector analysis and determine the course to steer to make the intended course.	The candidate's course to steer is within ± 5° of the assessor's solution.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	*Thorough knowledge of and ability to use navigational charts and publications, such as sailing directions, tide tables, notices to mariners, radio navigational warnings and ship's routing information**	On a ship, or in a navigational laboratory, given notices to mariners and uncorrected charts, and publications,	the candidate will correct five charts and three publications, including the *Light List* or the *List of Lights*.	The candidate: 1. identifies the charts and publications needing correction; 2. makes the proper corrections to the affected charts and publications; 3. records all corrections on the charts and in the chart-correction record or on the chart-correction spreadsheet; and 4. records all corrections to publications on the correction page of the publication and on the publication-correction card or the publication-correction spreadsheet.
	Thorough knowledge of and ability to use navigational charts and publications, such as sailing directions, tide tables, notices to mariners, radio navigational warnings and	On a ship, or in a navigational laboratory, given a voyage of at least 1,000 nm between the port of departure and the port of arrival, and given the appropriate chart catalog,	the candidate will identify the charts needed for the voyage.	The candidate: 1. correctly identifies the names and numbers of the charts and records them; 2. selects the charts with the largest scales appropriate for the area being transited; and 3. ensures there is no gap in chart coverage for any portion of the voyage requiring coastal

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	(cont'd) *ship's routing information**			(cont'd) navigation between departure and arrival at any port.
		On a ship, a full-mission ship simulator, or in a navigation laboratory, when given three way-points consisting of a position of departure, a position of arrival, and one other way-point, with total distance of more than 1,000 nm,	the candidate will: 1. determine the appropriate courses and distances between way-points; and 2. plot the intended courses on the charts selected.	The candidate: 1. correctly calculates courses and distances between way-points; 2. ensures the route is the most direct; and 3. plots the courses on the appropriately scaled charts noting the ETA at each way-point, including the final way-point.
	Electronic systems of position fixing and navigation* *Ability to determine the ship's position by use of electronic navigational aids** GPS or DGPS	On a ship underway, or on a full-mission ship simulator, or in a navigation laboratory, using a GPS or DGPS receiver which meets IMO performance standards,	the candidate will initialize a GPS or DGPS receiver, determine the ship's position and evaluate the accuracy of that position.	The candidate: 1. initializes the system; and 2. determines the accuracy of the position.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		On a ship underway, or on a full-mission ship simulator, or in a navigation laboratory, using a GPS or DGPS receiver which meets IMO performance standards, when hearing "Man Overboard,"	the candidate will activate the man overboard/emergency position save function.	The candidate saves or records the ship's position within one minute of hearing "Man Overboard."
	*Ability to determine the ship's position by use of electronic navigational aids** LORAN	On a ship underway, or on a full-mission ship simulator, or in a navigation laboratory, using a LORAN receiver which meets both national and international performance standards,	the candidate will initialize a LORAN receiver, determine the ship's position, and evaluate the accuracy of that position.	The candidate: 1. turns on the receiver; 2. selects the appropriate station pair; 3. reads and correctly plots the lat/long or TDs within 0.1 nm of the assessor's solution on a chart with a scale of no more than 1:150,000; and 4. evaluates the accuracy of the fix using the system and receiver limitations and TD crossing angles.
	Echo Sounders* *Ability to operate the equipment and*	On a ship underway, using an echo sounder which meets IMO performance standards or a part-task trainer	the candidate will turn on, test and operate the echo sounder.	The candidate: 1. turns the system on; 2. tests the echo sounder in accordance with manufacturer's

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	(cont'd) *apply the information correctly**	(cont'd) that realistically simulates all the functions and controls of an echo sounder which meets IMO performance standards,		(cont'd) recommendations; 3. notes the correct UTC on the echo sounder paper (if fitted); 4. ensures the scale selected is the lowest appropriate for the vessel's draft and the depth of water of the area of transit; and 5. adjusts the sensitivity to obtain proper depth reading on the display and correct trace on the paper (if fitted).
	Compass – Magnetic and Gyro* *Ability to determine errors of the magnetic and gyro-compasses, using terrestrial means, and to allow for such errors**	On a ship underway or on a full-mission ship simulator, using navigational or natural terrestrial ranges,	the candidate will take a visual bearing of the range and determine gyro-compass error.	The candidate: 1. compares the visual bearing to the charted bearing; 2. determines the compass error and properly labels it; and 3. determines the gyro-compass error ±0.5° of the assessor's solution.
		On a ship underway or	the candidate will	The candidate: 1. compares the magnetic heading to

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) on a full-mission ship simulator, with both a magnetic and gyro-compass,	(cont'd) determine the magnetic compass error.	(cont'd) the corrected gyro heading (corrected for a known gyro error); and 2. determines the magnetic compass error and properly labels it; 3. determines the magnetic compass error ±0.5° of the assessor's solution; and 4. correctly records it in the compass record book and the ship's log.
		On a ship underway or on a full-mission ship simulator, using navigational or natural terrestrial ranges, using only a magnetic compass, and a chart with variation,	the candidate will note the vessel's magnetic-compass heading while aligned on the range and determine magnetic compass deviation.	The candidate: 1. compares the magnetic heading to the charted range bearing; 2. determines the magnetic compass error and properly labels it; 3. determines variation from the chart; 4. determines magnetic compass deviation ±0.5° of the assessor's solution; and 5. correctly records it in the compass record book and the ship's log.
		On a ship underway or on a full-mission ship simulator, and given a deviation table,	the candidate will correctly apply the compass error to the course by magnetic	The candidate correctly applies compass error to the magnetic course and his or her solution is ± 1° of the assessor's solution.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
			(cont'd) compass to make good the intended true course.	
		On a ship underway or on a full-mission ship simulator, or in a navigational laboratory, and given a deviation table, on a chart with a scale of no more than 1:150,000,	the candidate will correctly apply the compass error to the bearings by magnetic compass of at least two charted objects and plot them on the chart in use.	The candidate: 1. correctly applies compass error to the magnetic bearings; and 2. determines the objects' position ±0.5 nm of the assessor's solution.
	*Ability to determine errors of the magnetic and gyro-compasses, using celestial means, and to allow for such errors** Azimuth of the sun Note 1	On a ship underway, and using a standard azimuth circle,	the candidate will read the gyro-compass bearing of the sun and determine gyro-compass error.	The candidate: 1. reads the azimuth of the sun when the repeater is level; 2. notes the time of the reading; 3. determines the true azimuth of the sun for the time of the reading; 4. compares the gyro-compass azimuth to the true azimuth and determines the gyro error; and 5. determines gyro-compass error ±0.5° of the assessor's solution.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	Steering control systems* *Adjustment of controls for optimum performance**	On a ship underway or on a full-mission ship simulator,	the candidate will conduct the pre-departure test of the vessel's steering gear. Note 2	The candidate: 1. turns on the steering control system; 2. aligns the steering gyro-repeater with the master gyro-compass; 3. tests the controls for switching pumps and motors between the port and starboard steering systems after the required warm-up period; and 4. tests both the port and starboard steering systems as follows: a. when the control is switched to hand steering, the rudder is tested throughout its full range of motion; and b. when the control is switched to non follow-up, the rudder is tested throughout its full range of motion.
		On a ship underway or	the candidate will set	The candidate sets :

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) on a full-mission ship simulator, while in auto-pilot,	(cont'd) the rudder and weather controls that are most suitable for the weather and sea conditions.	(cont'd) 1. the weather control in accordance with the manufacturer's recommendations for the prevailing sea conditions; 2. the rudder control in accordance with the manufacturer's recommendations for the prevailing sea conditions for the area transited or simulated; and 3. the rate of turn control (if fitted) in accordance with the standing orders.
	Meteorology* *Ability to use and interpret information obtained from on-board meteorological instruments.**	On a ship underway or in a laboratory,	the candidate will determine the barometric pressure in millibars, or in inches or millimeters of mercury.	The candidate: 1. reads the barometer read and applies the appropriate corrections; and 2. determines the barometric pressure within 0.5 millibar, .02 inch or 0.4 millimeter of the assessor's corrected reading.
		On a ship underway or in a laboratory, while	the candidate will determine true wind	The candidate converts the apparent wind speed and direction to true wind

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) using an anemometer,	(cont'd) speed and direction.	(cont'd) speed and direction within one point for direction and five knots for speed of the assessor's solution.
		On a ship underway or in a laboratory, while using the surface, upper air and sea state analysis weather maps,	the candidate will determine the weather to be encountered during the next 24-hour period.	The candidate determines expected wind, sea, and weather conditions (types and amount of cloud cover, rain, and fog) based on standard meteorological principles and they agree with the assessor's determinations, based on the movement of the systems and fronts.
Maintain a safe navigational watch.	***Watchkeeping**** *Thorough knowledge of the content, application and intent of the International Regulations for Preventing Collisions at Sea**	At night, on a ship underway, on a full-mission ship simulator, or using approved laboratory equipment,	the candidate will identify vessels through observation of their light configurations.	The candidate correctly identifies the situation or occupation of 18 of 20 vessels that have different light configurations.
		In daylight, on a ship underway, on a full-mission ship simulator, or using approved	the candidate will identify vessels through observation of	The candidate correctly identifies the situation or occupation of 18 of 20 vessels that are displaying different required shapes.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) laboratory equipment,	(cont'd) their required shapes.	
		In restricted visibility, on a ship underway, on a full-mission ship simulator, or using approved laboratory equipment,	the candidate will identify vessels by hearing their required sound signals.	The candidate correctly identifies the situation or occupation of 9 of 10 vessels sounding different required sound signals.
		On a ship underway, on a full-mission ship simulator, or using approved laboratory equipment, while using a gyro-compass repeater and an azimuth circle, bearing circle, alidade, or other device for taking bearings, and a marine radar or ARPA (which meet IMO performance standards) set on the 12-mile scale and the targets more than 8 nm	the candidate will determine if risk of collision exists with approaching meeting, crossing and overtaking vessels.	The candidate: 1. takes two visual bearings of an approaching vessel using an azimuth circle, bearing circle, or alidade to determine if the bearing to the approaching vessels is appreciably changing, and each observation is within ± 2° of the assessor's solution; and 2. takes two electronic bearings of an approaching vessel on a radar or an ARPA to determine if the bearing to the approaching vessels is appreciably changing and each observation is within ± 2° of the assessor's solution.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) away,		
		On a ship underway, on a full-mission ship simulator, or using approved laboratory equipment, when risk of collision with an approaching meeting vessel exists in good visibility in the open ocean,	the candidate will apply the rules of the road correctly and maneuver the vessel to avoid the collision, if required.	The candidate: 1. determines the aspect of the approaching vessel; 2. identifies the situation as a meeting situation; 3. takes positive action in ample time in accordance with the steering and sailing rules to achieve a CPA of at least 3 nm; and 4. makes speed or course changes large enough to be readily apparent to another vessel observing visually or by radar.
		On a ship underway, on a full-mission ship simulator, or using approved laboratory equipment, when risk of collision with an approaching crossing vessel (from the candidate's starboard side at a relative bearing of between 30	the candidate will apply the rules of the road correctly and maneuver the vessel to avoid the collision, if required.	The candidate: 1. determines the aspect of the approaching vessel; 2. identifies the situation as a crossing situation; 3. takes positive action in ample time in accordance with the steering and sailing rules to achieve a CPA of at least 3 nm; and

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) degrees and 112.5 degrees) exists in good visibility in the open ocean,		(cont'd) 4. makes speed or course changes large enough to be readily apparent to another vessel observing visually or by radar.
		On a ship underway, on a full-mission ship simulator, or using approved laboratory equipment, when risk of collision with an approaching overtaking vessel exists in good visibility in the open ocean,	the candidate will apply the rules of the road correctly and maneuver the vessel to avoid the collision, if required.	The candidate: 1. determines the aspect of the approaching vessel; 2. identifies the situation as an overtaking situation; 3. attempts to call the overtaking vessel on the VHF; 4. sounds the danger signal, if required by the rules; 5. takes positive action in ample time in accordance with Rule 17 of the steering and sailing rules to achieve a CPA of at least 1 nm; and 6. makes speed or course changes large enough to be readily apparent to another vessel observing visually or by radar.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	*Thorough knowledge of the principles to be observed in keeping a safe watch**	On a ship underway or on a full-mission ship simulator during an exercise at sea,	the candidate will properly relieve the watch in accordance with STCW Code Section A-VIII/2, Part 3-1, Paragraphs 21 and 22.	The candidate: 1. reads the standing orders and night orders; 2. reads the vessel's position, course, and speed from the GPS or DGPS receiver and compares them to the DR position and track; 3. compares the position of the next charted way-point to the GPS or DGPS way-point and the route print out; 4. verifies the identity of critical aids to navigation in sight; 5. determines tides and currents as necessary; 6. determines visibility and weather; 7. checks and properly tunes the radar and/or ARPA; 8. checks all targets displayed on the radar and/or ARPA; 9. checks heading by magnetic and gyro-compass; 10. determines the navigational hazards likely to be encountered during the watch; 11. determines the possible effects of list, trim, water density, and squat

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) on under-keel clearance; 12. obtains courses, traffic, weather, and any special instructions from the officer being relieved; and 13. tells the officer being relieved that he or she is relieved.
		On a ship underway or on a full-mission ship simulator during an exercise at sea,	the candidate will properly keep a safe and environmentally sound navigational watch in accordance with STCW Code Section A-VIII/2, Part 3-1, Paragraphs 23 to 50.	The candidate: 1. closely and continuously monitors the voyage plan; 2. maintains a proper look-out using all available means; 3. maintains a safe speed throughout the watch period; 4. checks position, course, and speed at frequent intervals; 5. selects the appropriate steering mode for the area being transited; 6. ensures under-keel clearance is suitable for the draft of the vessel at all times; 7. makes course changes in accordance with the voyage plan; 8. fixes and plots the vessel's position on an appropriate chart at intervals suitable to the vessel's speed and the area being transited; 9. determines the identities of critical aids to navigation in sight;

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) 10. uses more than one method, including electronic and other navigational equipment, external fixed aids, geographic reference points, and hydrographic contours, to fix the vessel's position and to check the accuracy of fixes; 11. checks radio equipment frequently to verify it is functioning properly; 12. determines the risk or danger of collision with each approaching vessel and takes early and substantial action in accordance with the COLREGS to avoid collisions; 13. executes rudder and engine orders as ordered; 14. verifies the validity of the gyro input to all navigation equipment; 15. determines gyrocompass error by any available means and properly logs it; 16. correctly applies magnetic variation and compass deviation to courses and bearings; 17. determines that the person steering the vessel is competent to do so;

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) 18. determines tide and current conditions for the watch period in coastal or tidal waters; 19. properly determines set and drift and applies them to allow for set and drift; 20. correctly and timely records and reports the weather conditions near the ship as required; 21. checks running lights throughout the watch period; 22. notifies the master as directed by all master's or standing orders; 23. makes all required log entries; and 24. uses all relevant navigation information to identify protected marine habitats, areas, and sanctuaries.
		On a ship underway or on a full-mission ship simulator during an exercise at sea,	the candidate will notify the master as instructed, and when in doubt of other vessels' intentions, or in any circumstances that affect the routine navigation of the vessel in accordance	The candidate notifies the master immediately when any of the following occur: 1. the vessel encounters or expects to encounter restricted visibility; 2. concern is raised by vessel traffic density or the movements of other ships; 3. maintaining course is difficult;

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
			(cont'd) with STCW Code Section A-VIII/2, Part 3-1, Paragraph 40.	(cont'd) 4. there is a failure to sight land or a navigational mark, or to obtain soundings when expected; 5. aids to navigation are not in position or are displaying incorrect characteristics; 6. land or a navigational mark is unexpectedly sighted, or soundings obtained change unexpectedly; 7. failure of the engines or control systems, steering, or any essential navigational equipment, or sounding of alarms or indicators for these systems; 8. failure of any radio equipment; 9. concerns arise in heavy weather about damage to the vessel or its cargo; 10. notice of any hazard to navigation that poses a threat to the vessel; 11. any doubt about the ship's safety or other emergency arises; or 12. any changes are made to the voyage plan.
		On a ship at anchor or on a full-mission ship	the candidate will properly keep a safe	The candidate: 1. determines and plots the ship's

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) simulator during an exercise at anchor with wind and seas building,	(cont'd) anchor watch in accordance with STCW Code Section A-VIII/2, Part 3-1, Paragraph 51.	(cont'd) position; 2. frequently checks the ship's position by visual and radar bearings and radar ranges from the same charted objects; 3. establishes the GPS or DGPS anchor alarm; 4. maintains a proper lookout; 5. ensures periodic inspections are made; 6. posts a rating at the anchor to carry out orders with respect to the anchor; 7. monitors weather, tides, and sea state; 8. notifies the master immediately when the weather changes, visibility becomes restricted, or the anchor starts to drag; 9. places engines on standby and ensures they are ready for immediate use where appropriate; and 10. properly displays all required lights and shapes and sounds proper sound signals.
		On a ship at sea or on a full-mission ship	the candidate will recognize the	The candidate: 1. determines that there is restricted

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) simulator during an exercise at sea, when visibility becomes restricted while underway,	(cont'd) restricted visibility and take the appropriate action to navigate in restricted visibility in accordance with the COLREGS and in accordance with Section STCW Code A-VIII/2, Part 3-1, Paragraph 45.	(cont'd) visibility; 2. notifies the master; 3. switches the steering to hand steering; 4. posts a proper lookout and turns the running lights on; 5. adjusts the vessel's speed to reflect the change of circumstances in accordance with Rule 6; 6. commences the sounding of required signals; 7. sets the radar and/or ARPA on the appropriate scale to scan at long range for the presence of other vessels; and 8. plots approaching targets on the radar and/or ARPA, if fitted, and uses fixes to obtain early warning of risk of collision and to determine the speed and direction of relative motion.
		On a ship at sea or on a full-mission ship simulator during an exercise at sea,	the candidate will turn the watch over.	The candidate: 1. plots a DR position on the chart in use for the end of the watch; 2. determines the ship's position and plots it by all means appropriate to the area being transited; 3. reads the required weather data

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) and records it in the deck log; 4. compares and records the heading of the gyro and magnetic; 5. checks the movement of all vessel traffic by both visual and electronic means immediately before being relieved; 6. relays the vessel's course and speed, posting of special lookouts, steering mode in use, and weather and visibility to the relieving officer; 7. relays any special instructions regarding occurrences during the past watch or which are expected during the next watch; 8. reports all relevant information concerning vessels in sight or on the radar and/or ARPA to the relieving officer; 9. notifies the master if there is any doubt that the relieving officer is competent to perform his or her duties; 10. does not relinquish the watch during a maneuver or other action being taken to avoid a hazard to

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) navigation; and 11. does not relinquish the watch or leave the bridge until he/she has been informed by the relieving officer that he or she is ready to take the watch.
	*Thorough knowledge of effective bridge teamwork procedures**	On a ship, a full-mission ship simulator, or in a navigation laboratory, when given a port of departure and a port of arrival more than 1,000 nm apart,	the candidate will plan a safe and environmentally sound voyage and review the voyage plan with the master and deck officers.	**Appraisal** (The candidate's plan takes into account paragraph 2 of the annex to IMO Assembly Resolution A.893(21)): 1. the condition of the vessel, and its stability, equipment, operational limitations, draft, and maneuvering characteristics; 2. any special characteristics of the cargo and its stowage; 3. crew members' competency and rest status; 4. the status of all ship's certificates and documents; 5. up-to-date charts of proper scale, and the latest notices to mariners and radio navigational warnings; 6. up-to-date coast pilots, sailing directions, and other information sources appropriate for the voyage; 7. relevant routing guides; 8. up-to-date tide and current tables

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) and atlases; 9. weather information; 10. weather routing services; 11. ship-reporting systems, VTS and environmental protection measures; 12. vessel traffic density for the route; 13. pilotage requirements and information exchange; and 14. port information, including emergency response capability. **Planning** (The candidate's plan contains the following in accordance with paragraph 3 of the annex to IMO Assembly Resolution A.893(21)): 15. courses plotted on the appropriately scaled charts noting the ETA at each way-point, including the final way-point; 16. courses and distances between way-points are correctly calculated and indicated on the charts; 17. the most direct route that avoids all hazards to navigation by the margin of safety of 3 nm; 18. the areas of all required speed

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) changes; 19. the minimum under-keel clearances in critical areas; 20. positions requiring a change of machinery status; 21. way-point of all course changes; 22. the methods and frequency of position fixing, including areas requiring the highest accuracy; 23. the positions and radio hailing frequencies or channels where port authorities, pilots and VTS services must be notified are noted on the relevant chart; 24. the state of the tide and currents at the port of departure for the times of departure and transit; 25. contingency plan for alternative actions in cases of emergency; 26. the review of the voyage plan with the Master and deck officers; and 27. all relevant navigation information is used to identify protected marine habitats, areas and sanctuaries.
		On a ship, or on a full-mission ship simulator, when given a voyage plan,	the candidate will execute the voyage plan.	**Execute a voyage plan** (The candidate, in accordance with paragraphs 4 and 5 of the annex to IMO Assembly Resolution

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) A.893(21)): 1. checks the reliability and condition of the navigational equipment at frequent intervals; 2. applies basic information obtained from the tide tables and other navigational publications to determine under-keel clearance; 3. fixes the vessel's position at appropriate intervals; 4. checks magnetic and gyro-compasses; 5. assesses meteorological information; 6. determines compass error; 7. calculates sailings for up to 24 hours; 8. correctly operates and applies information from electronic navigation systems; 9. correctly operates the radar and/or ARPA and applies the information for navigation and collision avoidance; 10. correctly operates propulsion and steering systems to control heading and speed; 11. initiates action in event of a real or

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) simulated equipment malfunction or failure of major items of equipment; 12. correctly conducts radio-communications; 13. monitors and correctly operates safety and alarm systems; and 14. closely and continuously monitors the voyage plan.
	*Thorough knowledge of effective bridge teamwork procedures** Watch Augmentation	BRM Recognition of watch condition On a ship at sea or on a full-mission ship simulator during an exercise at sea, when help is needed because of restricted visibility, vessel traffic or safety of navigation,	the candidate will recognize the need for additional personnel on the bridge and notify the master.	The candidate notifies the master immediately if: 1. the vessel encounters or expects to encounter restricted visibility; 2. there is cause for concern because of vessel traffic density or the movements of other ship; 3. the vessel will transit restricted waters with vessel traffic; or 4. he or she is fatigued to the point that decision making is affected.
	*Thorough knowledge of effective bridge teamwork procedures **	BRM Condition III: the ship is navigating near land, shoals or with increased traffic density and/or	The candidate will identify all vessels (targets) posing a risk or danger of collision, and provide appropriate	The candidate: 1. determines the risk and danger of collision of all approaching vessels within 6 minutes; 2. immediately notifies the conning officer of the relative position of

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) restricted visibility. This condition requires concentrated navigation and observation of traffic for collision avoidance (entering or leaving port). On a ship at sea or on a full-mission simulator during an exercise at sea, and with a bridge team in place for navigating in congested near-coastal waters with or without reduced visibility, and assigned to monitor vessel's traffic, using a radar or ARPA which meets all national and international performance requirements,	(cont'd) information and recommendations on vessel traffic and any other situation or condition that may affect the safe navigation of the vessel to the conning officer.	(cont'd) the threatening vessel, its CPA and TCPA; 3. recommends course changes in accordance with the COLREGS to remove the risk of collision and prevent close-quarters situations from developing; 4. ensures all recommended course or speed changes result in increasing the CPA of approaching vessels identified as posing a risk or danger of collision; 5. ensures all recommended course changes provide sufficient sea room and bottom clearance for the area being transited; 6. ensures communications are clear, immediate, reliable, and relevant; and 7. ensures non-essential activities are avoided.
		BRM Condition III	the candidate will determine and plot the vessel's position by	The candidate: 1. uses visual and electronic means to determine the ship's position,

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) On a ship at sea or on a full-mission ship simulator during an exercise at sea, and with a bridge team in place for navigating in congested near-coastal waters with or without reduced visibility, and assigned to monitor vessel's position, communicate on the VHF, and all other bridge duties, using an IMO compliant ARPA, a GPS or DGPS receiver and all the bridge equipment identified in the standard,	(cont'd) electronic and visual means, communicate as required on the VHF, and carry out all engine commands, ensure that all rudder commands are properly carried out, and make all appropriate log book entries.	(cont'd) including GPS or DGPS, LORAN, radar, ARPA, ECDIS (if fitted), and Echo Sounder; 2. plots the vessel's position in accordance with tolerances stated previously at regular intervals appropriate to the vessel's speed and the area being transited; 3. determines the correct courses to steer to maintain the ship on the intended track and recommends them to the conning officer; 4. answers all VHF calls to own ship and makes calls to other ships in the area and port authorities as required; 5. monitors the helmsman to ensure all rudder commands are carried out; 6. ensures communication is clear, immediate, reliable, and relevant; 7. ensures non-essential activities are avoided; and 8. makes all required entries in the appropriate vessel's logs.
	Thorough knowledge of	BRM Condition II or III	the candidate will monitor his or her vessel's movement,	The candidate: 1. detects the misinformation or

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	(cont'd) *effective bridge teamwork procedures** Error trapping	(cont'd) Condition II: The ship is underway offshore in restricted visibility, with increased traffic, land or shoals affecting navigation (coastwise navigation). On a ship at sea or on a full-mission ship simulator during an exercise at sea, and with a bridge team in place for navigating in congested near-coastal waters with or without reduced visibility, and assigned duties as an officer in a bridge team, when one of the following occur: 1. an incorrect rudder order is given; 2. a rudder or engine command is not given at the proper time to maintain the	(cont'd) recognize erroneously-stated information about the vessel's position or a target vessel's movement, and notify the conning officer of specific questions regarding the vessel's situation.	(cont'd) command error; and 2. notifies the officer within 30 seconds of the occurrence of the error (for helm orders, the candidate detects the error and issues a corrective order within 5 seconds).

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) intended track; 3. a navigational aid is misidentified; 4. the vessel's position is improperly fixed; or 5. a target vessel's movements are improperly stated,		
	*Thorough knowledge of effective bridge teamwork procedures** Prioritization	BRM Condition II or III On a full-mission ship simulator during an exercise at sea, and with a bridge team in place, while navigating in congested near-coastal waters in good visibility, and assigned duties as an officer in a bridge team, and given the following: 1. a vessel on own ship's starboard bow changes course	the candidate will determine the appropriate action to take.	The candidate: 1. assesses the situation; 2. determines in which priority action must be taken for the safety of the vessel; 3. recommends that the engines be slowed or stopped in sufficient time to avoid the collision with the vessel on the starboard bow; and 4. after the danger of collision is over, acknowledges the distress call.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) and creates a risk of collision; 2. there is insufficient water depth for own ship to turn to starboard; 3. the diesel engines are using heavy fuel; 4. a vessel ahead is on a reciprocal course 1.5 nm away with a CPA of 0.5 nm on the port side; and 5. the GMDSS distress alarm sounds,		
	*Thorough knowledge of effective bridge teamwork procedures**	BRM Condition II On a ship at sea or on a full-mission ship simulator during an exercise at sea, when acting as part of the bridge team and assigned duties to	the candidate will determine and plot the vessel's position at suitable intervals, and plot or systematically observe all approaching vessels and inform the bridge team of dangers to navigation, intended course changes, and	The candidate: 1. determines the vessel's position and plots it at suitable intervals; 2. identifies all aids to navigation; 3. notifies the bridge team immediately of the following; a) when planned course changes must be made;

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) monitor the vessel's navigation and determine the risk or danger of collision with all vessels underway in open sea, using an ARPA meeting all national and international performance requirements, a GPS or DGPS receiver and all the bridge equipment identified in the standard,	(cont'd) vessels which pose a risk or danger of collision.	(cont'd) b) effects of tides or currents are setting the vessel off its intended course; or c) there is any doubt about the vessel's position. 4. determines by visual and radar/ARPA bearings that risk and danger of collision exists with approaching vessels in the vicinity; and 5. notifies the bridge team of the following: a) danger or risk of collision exists with any approaching vessel; b) recommended course change to avoid the risk or danger of collision; and c) recommended speed change to avoid the risk or danger of collision if the engines are available for

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) immediate use.
		BRM Condition III On a ship at sea or on a full-mission ship simulator during an exercise at sea, to establish a bridge team to monitor the vessel's navigation and determine the risk or danger of collision with all vessels,	the candidate will determine the number of officers and crewmembers required to safely navigate the vessel and assign individual officers and crewmembers specific duties and functions as part of the bridge team.	The candidate assigns the bridge team to the following tasks: a) conning; b) lookout; c) collision avoidance; d) navigation; communication; and e) administration.
Use of radar and ARPA to maintain safety of navigation.	***Radar Navigation**** *Ability to operate and to interpret and analyze information obtained from radar, including the following:*	On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and other applicable national and international performance standards,	the candidate will set up and maintain the radar display.	The candidate, within three minutes after the power is turned on: 1. switches the set from standby to transmit; 2. selects the appropriate scale; 3. adjusts the gain control so that targets and sea return appear; 4. adjusts the tune control (if the unit is not self-tuning); 5. adjusts the brilliance control; 6. adjusts the sea clutter and rain clutter controls to suppress the rain

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	(cont'd) *Performance, including,* *.2 setting up and maintaining displays**			(cont'd) and sea clutter without losing targets; and 7. selects the north-up stabilized relative motion.
		On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and other applicable national and international performance standards,	the candidate will switch the display from north-up stabilized relative motion to true motion to head-up, and state how to recognize the mode displayed.	Within 15 seconds, the candidate: 1. switches the display from north-up stabilized relative motion to true motion; 2. switches the display from true motion to head-up; and 3. points to the location on the display of the information that indicates the mode displayed.
	Radar Navigation* *Ability to operate and to interpret and analyze information obtained from radar, including*	On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and other applicable national and international performance standards,	the candidate will identify false echoes, sea return, a racon and SART.	The candidate recognizes and correctly identifies: 1. the false echoes: a. indirect or false echoes; b. side-lobe effects; c. multiple echoes; d. second-trace echoes; e. electronic interference; and f. spoking; 2. sea return; 3. racons; and

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	(cont'd) *the following:* *Performance, including,* *.3 detection of misrepresentation of information, false echoes, sea return, etc., racons and SARTs**			(cont'd) 4. SARTS.
	Radar Navigation* *Use, including:* *.1 range and bearing, course and speed of other ships; time and distance of crossing, meeting, and overtaking ships.**	On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and other applicable national and international performance standards, with land and aids to navigation in range,	the candidate will determine the range and bearing to an object.	1. The candidate determines the range and bearing to an object selected by the assessor within 30 seconds. 2. The candidate's: a. range is within ± 0.1 nm of the assessor's solution or ± 1% of the range scale in use; and b. bearing is within ± 1° of the assessor' s solution.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	Radar Navigation* *2 identification of critical echoes.**	On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and other applicable national and international performance standards, set on the 12-mile scale, with at least 5 vessels on the display,	the candidate will determine if risk of collision or danger of collision exists with all approaching vessels.	The candidate identifies: 1. all approaching vessels whose bearings do not change appreciably; and 2. all vessels that have a CPA of less than 3 nm. The candidate makes all determinations within 8 minutes of determining the initial range and bearing of each vessel.
	Radar Navigation* *.2 identification of critical echoes; detecting course and speed changes of other ships; effective changes of own ship's course and speed**	On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and other applicable national and international performance standards, set on the 12-mile scale,	the candidate will determine: 1. the range and bearing to 3 other ships (meeting, crossing, and overtaking); 2. the DRM and SRM of all other ships; and 3. the CPA and TCPA of all vessels.	The candidate completes: 1. the range and bearing solution within 30 seconds and they are within the previously stated tolerances; 2. the DRM solution within 6 minutes and it is ± 5° of the assessor's solution; 3. the SRM solution within 7 minutes of initial range and bearing and it is ± 2 knot of the assessor's solution; 4. the CPA solution within 7 minutes and it is ± 0.5 nm of the assessor's solution; and 5. the TCPA solution within 8

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) minutes and it is ± 3 minutes of the assessor's solution.
		On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and other applicable national and international performance standards, set on the 12-mile scale, in the stabilized relative motion north-up mode, and with meeting or crossing targets,	the candidate will detect speed and course changes of other ships which result in a change in the direction or speed of relative motion.	The candidate detects other ships' speed changes of at least 5 knots and/or course changes of at least 10° within 10 rotations of the sweep (30 seconds) from the time he or she begins the systematic observation of the display.
	Radar Navigation* *.2 identification of critical echoes; detecting course and speed changes of other ships; effective changes of own ship's*	On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and other applicable national and international performance standards, on the 12-mile scale in north-up stabilized	the candidate will control the target vessel's DRM by changing own ship's course in accordance with the COLREGS.	The candidate: 1. determines the new course to steer to achieve a 2 nm CPA; 2. executes a turn to starboard; and 3. achieves a CPA of not less than 1.8 nm or more than 2.2 nm.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	(cont'd) *course and speed* *.3 application of International Regulations for Preventing Collisions at Sea**	(cont'd) relative motion mode, with a ship on the starboard bow with a CPA of 0.5 nm,		
		On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and other applicable national and international performance standards, set on the 12-mile scale, in the north-up stabilized relative motion mode, with a vessel on the beam with a CPA of less than 0.5 nm ahead,	the candidate will control the target vessel's DRM by changing own ship's speed in accordance with the COLREGS.	The candidate: 1. determines the new speed to achieve a 2 nm CPA; 2. executes a speed reduction; and 3. achieves a CPA of not less than 1.8 nm or more than 2.2 nm.
	Radar Navigation* *.4 plotting*	On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and	the candidate will determine the true course and speed of three target vessels.	The candidate: 1. constructs a relative motion triangle on either a reflection plotter, a maneuvering board or a

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	(cont'd) *techniques and relative and true motion concepts**	(cont'd) other applicable national and international performance standards, set on the 12-mile scale, in the relative motion north-up mode, using any graphically correct method,		(cont'd) transfer plotting sheet; and 2. solves for the target vessel's true course and speed within 8 minutes. The candidate's true course solution is ± 5° and the true speed solution is within ± 5 knots of the assessor's solution.
		On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and other applicable national and international performance standards, set on the 12-mile scale, in the true motion mode, using any graphically correct method,	the candidate will determine the DRM, SRM, CPA and TCPA of three target vessels.	The candidate: 1. constructs a relative motion triangle on either a reflection plotter, a maneuvering board or a transfer plotting sheet; 2. obtains a DRM solution within 8 minutes and within ± 5° of the assessor's solution; 3. obtains a SRM solution within 8 minutes of initial range and within ± 2 knots of the assessor's solution; 4. obtains a CPA solution within 7 minutes and within ± 0.5 nm of the assessor's solution; and 5. obtains a TCPA solution within 8 minutes and within ± 3 minutes of the assessor's solution.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	Radar Navigation* *.5 parallel indexing**	On an operational radar or radar simulator that meets the standards of 33 CFR 164.38 and other applicable national and international performance standards, set on the 12-mile scale, in relative motion north-up mode, with aids to navigation and a coastline displayed on the display,	the candidate will use a parallel index line to monitor and maintain the vessel on track.	The candidate: 1. constructs a parallel index line through the edge of the known hazard to navigation or land mass; and 2. monitors the vessel's movement by referring to the relative position of the PI in relation to the land mass or other fixed radar conspicuous target. The vessel must not drift more than 10 % of the set distance toward the known hazard or land mass.
	Principle types of ARPA, their display characteristics, performance standards and the dangers of over-reliance on ARPA. *Ability to operate and to interpret and analyze*	On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards for ARPA),	the candidate will set up and maintain the ARPA display.	Within three minutes, the candidate: 1. turns the power on; 2. initializes performance monitor; 3. notes error messages; 4. switches from standby to on; 5. selects the appropriate scale; 6. adjusts the gain control so that targets and sea return appear; 7. adjusts the tune control (if the unit is not self-tuning); 8. adjusts the brilliance control;

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
	(cont'd) *information obtained from ARPA, including:* *.1 system performance and accuracy, tracking capabilities and limitations, and processing delays* *.2 use of operational warnings and system tests** Note 3			(cont'd) 9. adjusts the sea clutter and rain clutter controls to suppress the rain and sea clutter without losing targets; 10. selects display north-up stabilized relative motion; 11. selects proper gyro course and speed input; and 12. selects sea-stabilized mode.
	*.3 methods of target acquisition and their limitations** Note 3	On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards	the candidate will acquire ten targets manually.	The candidate manually acquires 10 targets within 2 minutes.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) for ARPA), with at least 10 targets on the selected range,		
		On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards for ARPA), with the ARPA on the 12-mile scale, and in automatic acquisition,	the candidate will establish an exclusion area that suppresses the automatic acquisition of targets in that area.	The candidate establishes an exclusion area within 2 minutes on the port or starboard side of the vessel that is either: 1. described by an arc of 90° on the appropriate side of the vessel; or 2. described by a line parallel to the vessel's track four nm from the vessel.
	*.4 true and relative vectors, graphic representation of target information and danger areas** Note 3	On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards for ARPA), with the ARPA on the 12-mile	the candidate will switch between true and relative vectors and change the length of the vectors from 6 minutes to 30 minutes.	The candidate switches between true and relative vectors and changes the length of the vectors within 10 seconds.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) scale,		
		On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards for ARPA), with the ARPA on the 12-mile scale,	the candidate will designate two acquired targets.	The candidate designates: 1. two of the acquired targets for an alphanumeric display of the target information; and 2. the designation is completed within 10 seconds for each target.
		On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards for ARPA),	the candidate will cancel a single target.	The candidate cancels a single target within 5 seconds.
		On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA	the candidate will demonstrate the ability to display a target's (cont'd) history.	The candidate correctly: 1. operates the controls that display a target's history; and 2. displays the target's history within

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) simulator that meets applicable national and international performance standards for ARPA), on the 12-mile scale,	(cont'd) history.	(cont'd) 10 seconds.
		On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards for ARPA), with the ARPA on the 12-mile scale,	the candidate will establish the CPA and TCPA for dangerous targets.	The candidate determines the parameters for dangerous targets by: 1. entering a minimum CPA; and 2. entering a minimum TCPA. The candidate completes data entry within 1 minute.
		On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards	the candidate will establish an alarm area with outer and inner guard rings.	The candidate establishes an alarm area with an outer guard ring of 8 nm and an inner guard ring of 4nm within 2 minutes.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) for ARPA), with the ARPA on the 12-mile scale,		
	*.5 deriving and analyzing information, critical echoes, exclusion areas and trial maneuvers** *Note 3*	On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards for ARPA), with the ARPA on the 12-mile scale, with at least ten targets within 12 nm of own ship,	the candidate will demonstrate the trial maneuver function.	The candidate: 1. accesses the trial maneuver mode; 2. enters course changes; 3. determines the course to steer to avoid all targets by at least 2 nm, within 30 seconds; 4. enters speed changes; 5. determines the speed necessary to avoid all targets by at least 2 nm, within 30 seconds; and 6. returns the display to real time.
		On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards for ARPA), with the	the candidate will switch the display from a north-up relative motion sea stabilized display to a true motion ground stabilized display.	The candidate completes the change within 10 seconds.

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) ARPA on the 12-mile scale,		
		On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards for ARPA), with the ARPA on the 12-mile scale,	the candidate will determine the range and bearing to an object.	The candidate: 1. determines the range and bearing to an object selected by the assessor within 30 seconds by positioning the VRM on the edge of the object which is closest to the vessel and positioning the EBL through the object; 2. obtains a range within ± 0.1 nm of the assessor's solution or ± 1% of the range scale in use; and 3. obtains a bearing within ± 1° of the assessor's solution.
		On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards for ARPA), with the	the candidate will establish a nav line to monitor and maintain the vessel on track.	The candidate: 1. constructs a nav line between the 2 nav marks and through the seaward edge of the known hazard to navigation or land mass; 2. positions the VRM at a distance named by the assessor from the edge of the nav line; 3. monitors the vessel's movement to

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) ARPA on the 12-mile scale, using 2 nav marks and one nav line,		(cont'd) determine if the edge of the VRM moves inside the nav line; and 4. ensures that the VRM does not drift more than 10 % of the VRM distance inside the nav line.
		On an operational ARPA that meets the standards of 33 CFR 164.38 (or an ARPA simulator that meets applicable national and international performance standards for ARPA), on the 12-mile scale,	the candidate will determine the set and drift of the vessel.	The candidate: 1. ensures the display is sea stabilized; 2. identifies, acquires, and designates a stationary target; and 3. reads the target's course and speed as the set and drift within 3 minutes.
Maneuver the ship.	***Ship maneuvering and handling**** *Maneuvering and procedures for the rescue of person overboard**	On a ship at sea or in a full-mission simulator, upon receiving notification of a Man-Overboard (MOB),	the candidate will immediately initiate either a Williamson Turn or Anderson Turn (as appropriate for conditions), return the vessel to the MOB, and give the command to launch the rescue boat.	The candidate: 1. orders full rudder to the side of MOB and places the engines on stand by (does not reduce RPMs); 2. simulates releasing the lighted buoy; 3. sounds MOB signal if other vessels are in sight; 4. marks (if equipped) the ship's position on ARPA/GPS or DGPS;

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
				(cont'd) 5. simulates a "Mayday" call on the VHF notifying any vessels in vicinity of the MOB; 6. completes the recovery turn; 7. states that the rescue boat would be prepared for launch, or scrambling nets rigged on correct side of the vessel; and 8. states that when on the reciprocal of the original course, the vessel will be slowed and stopped within .1 nm of the MOB to begin the recovery/search.
	Ship maneuvering and handling* Basic Maneuvering	On a ship at sea or in a full-mission simulator,	the candidate will order turning the vessel left or right more than 45^0 from the original heading.	The candidate: 1. orders the turn left or right more than 45° from the original heading by applying a minimum of 10° and a maximum of 20° of rudder; 2. reduces rudder as the ship approaches the new course; and 3. steadies on the new course without over-shooting the course by more than 10°.
		On a ship at sea, or in a full-mission simulator, proceeding at a speed	the candidate will execute an emergency stop.	The candidate, within the safe operating limits of the vessel's propulsion system, stops the vessel

STCW Competence	Knowledge, understanding and proficiency	Performance Condition	Performance Behavior	Performance Standard
		(cont'd) of at least half ahead,		(cont'd) using maximum astern thrust and rudder cycling without deviating from the original course by more than 20°.

* *Italics denote STCW proficiency from Table A-II/1 of the STCW*

Note 1 – For oceans route only
Note 2 – Required for officer in charge of a navigation watch of vessels greater than 3,000 GT
Note 3 – Not required for mariners serving exclusively on vessels not fitted with ARPA