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NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 1 02

Subj: GUIDELINES FOR ASSESSMENT OF SEAFARERS' PROFICIENCY IN ADVANCED FIRE-FIGHTING THROUGH DEMONSTRATIONS OF SKILLS

Ref: (a) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW), Regulation VI/3 and Section A-VI/3 of STCW Code, incorporated into regulations at 46 CFR 10.102(b)
(b) Federal Register dated August 4, 2000, Docket No. USCG-2000-7694-1, Guidelines for Proficiency in Advanced Fire-Fighting
(c) Guidelines for Proficiency in Advanced Fire-Fighting, Docket No. USCG-2000-7694, Available at: http://dms.dot.gov

1. PURPOSE. This Circular provides the national guidelines for the assessments of seafarers' proficiency in advanced fire-fighting through demonstrations of skills. These guidelines are for use in training programs approved or accepted by the Coast Guard as meeting reference (a) and by designated examiners (DEs) when carrying out their assessments.

2. ACTION. Officers in Charge, Marine Inspection (OCMIs), should use this Circular when establishing that candidates are entitled to hold STCW-95 certificates attesting proficiency in advanced fire-fighting. 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/**. The Coast Guard will distribute it by electronic means only.

3. DIRECTIVES AFFECTED. None.

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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 assessment criteria for certification attesting proficiency in advanced fire-fighting. The National Maritime Center (NMC) then used MERPAC's recommendations to develop proposed national guidelines, which we published for public comment in reference (b). Reference (c) contains the public's responses to the request for public comment. MERPAC's recommended guidelines included "knowledge" competencies not included within the national guidelines. The guidelines focus solely on the practical demonstrations of mariners' competency. Out of this process came the final version of the national assessment guidelines contained in enclosure (2).

5. DISCUSSION.

a. All mariners who commence training or sea service required by the STCW on or after August 1, 1998, or all mariners applying for STCW certification attesting proficiency in advanced fire-fighting on or after February 1, 2002, must, under 46 CFR 10.205(g), 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 applicant attesting proficiency in advanced fire-fighting in enclosure (2), the OCMI will not issue the STCW certification.

b. A person assessing mariners for STCW certification attesting proficiency in advanced fire-fighting should use either the guidelines in enclosure (2) or an alternative as discussed in paragraph 5. c when assessing practical demonstrations of proficiency.

c. Those who assess the proficiency of mariners may refine these published guidelines and develop innovative alternatives; however, before they use any deviations from these guidelines, they must submit them to the NMC for approval by the Coast Guard. A training institution submitting a course that leads to certification attesting proficiency in advanced fire-fighting 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 certification in advanced fire-fighting should use these guidelines for self-study and self-assessment.

PAUL J. PLUTA
ASSISTANT COMMANDANT FOR MARINE SAFETY
AND ENVIRONMENTAL PROTECTION

Encl: (1) Assessments of mariners
(2) Table A-VI/3, Assessment Guidelines, Specification of minimum standard of competence in Advanced Fire-Fighting

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 attesting proficiency in advanced fire-fighting 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 issue.

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 conditions, 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 the marine must recall, demonstrate, or perform. The third is the particular acts against which we

measure an applicant's behavior to determine whether the performance is 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 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 the Merchant Marine Personnel Advisory Committee (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 and if the performance standard were a score of 70%, three correct answers and one incorrect answer would meet the requirements for minimum competency. In this case the mariner would qualify as competent for that knowledge.

TABLE A-VI/3 Assessment Guidelines

Specification of minimum standard of competence in Advanced Fire-Fighting

** Indicates a proficiency from Table A-VI/3*

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Standard
Control fire-fighting operations aboard ships.	*Fire-Fighting procedures at sea and in port with particular emphasis on organization, tactics, and command**	Aboard a ship of 500 ITC or more at sea or in port, or in simulated shipboard conditions, given the full set of the ship's fire and emergency plans and procedures*, and one of the following (simulated) fire scenarios: (1) engine-room fire; (2) cargo-hold fire, and (3) service-space fire (*in cases of shore-side evaluation using simulated conditions, these documents would be developed to support a realistic scenario or simulation),	upon receipt of a report or other indication of fire, the candidate will take all required initial actions to alert required parties and dispatch appropriate assistance.	The candidate promptly orders the sounding of the correct signals and takes all required initial actions in a timely manner and in accordance with the ship's fire and emergency plans and procedures.
			upon receipt of initial on-scene reports from fire party or parties, the candidate will make an initial assessment of the fire (location, extent, and severity) and determine courses of action to control and extinguish the fire.	1. The candidate uses initial reports in conjunction with the ship's fire and emergency plans and procedures to correctly determine the location, extent, and severity of the fire. 2. Courses of action developed are consistent with ship's fire and emergency plans and procedures, and accepted tactics, strategies, and doctrines of shipboard fire fighting.
	Fire-Fighting procedures at sea and in port with	Aboard a ship of 500 ITC or more at sea or in port, or in simulated shipboard conditions, given the full	the candidate will demonstrate command, control, communication, and	1. Actions: a. are timely, complete, and in accordance with ship's fire and

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Standard
	*(cont'd) particular emphasis on organization, tactics, and command;** *Communication and coordination during fire-fighting operations;** *Ventilation control, including smoke extractor;** *Control of fuel and electrical systems;** *Management and control of injured persons**	(cont'd) set of the ship's fire and emergency plans and procedures*, and one of the following (simulated) fire scenarios: (1) engine-room fire; (2) cargo-hold fire, and (3) service-space fire (*in cases of shore-side evaluation using simulated conditions, these documents would be developed to support a realistic scenario or simulation),	(cont'd) coordination of a simulated shipboard fire fighting operation by (1) ordering all necessary system shutdowns, notifications, and movements of passengers and crew; and (2) deploying added fire parties to confine and extinguish the fire, rescue, remove, and treat casualties, and overhaul the fire.	(cont'd) emergency plans and procedures; b. minimize or mitigate risk to the injured, and to other passengers and crew; and c. are appropriate to the scenario and information received from periodic progress reports; Communications are clear, concise, and readily understood; fire parties and crew respond to orders as intended; Actions taken to coordinate operations achieve desired results; Actions taken to minimize spread of smoke using ventilation controls are timely, effective, and consistent with the ship's fire and emergency plans and procedures; Actions taken to secure fuel and electrical systems are timely, effective, and consistent with the ship's fire and emergency plans and procedures; Management and control of injured persons are timely, consistent with the ship's fire and emergency plans and procedures, and in accordance with

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Standard
				(cont'd) accepted emergency medical practice.
	*Use of water for fire-extinguishing, the effect on ship stability, precautions and corrective procedures**	Aboard a ship of 500 ITC or more at sea or in port, or in simulated shipboard conditions, given the ship's fire and emergency plans and procedures* and having one or more fire parties fighting one of the following (simulated) fire scenarios: (1) engine-room fire; (2) cargo-hold fire, and (3) service-space fire (*in cases of shore-side evaluation using simulated conditions, these documents would be developed to support a realistic scenario or simulation),	the candidate will determine the effect of streams of fire-fighting water on ship's stability and describe appropriate precautionary and corrective measures that could be taken in accordance with the ship's fire and emergency plans and procedures to maintain or prolong stability.	Qualitative estimates of on-board water retention based on differences between fire-stream flow and run-off based upon calculations, reports, and observations are correct; Candidate correctly describes timely and effective precautionary, compensating, and corrective actions that could be taken to maintain or prolong ship's stability based on expectations, predictions, calculations, and observations of effects of fire-fighting water.
Organize and train fire parties.	*Preparation of contingency plans;* *Composition and allocation of personnel to fire parties;* *Strategies and tactics for control of fires in various parts of the ship**	Aboard a ship of 500 ITC or more at sea or in port, or in simulated shipboard conditions, given the ship's fire and emergency plans and procedures* and having one or more fire parties fighting one of the following (simulated) fire scenarios: (1) a cargo-hold fire, (2) an engine-room fire, (3) a galley fire, or (4) a living-space fire (*in cases of shore-side evaluation using simulated conditions, these documents would be developed to	the candidate will prepare a contingency plan that includes the composition and allocation of personnel to fire parties and has a stated strategy and tactics for containing, controlling and extinguishing the fire.	Contingency plan is consistent with ship's fire and emergency plans and procedures; Fire-party assignments are consistent with training and physical abilities of personnel; Strategy and tactics are consistent with ship's fire and emergency plans and procedures, and accepted doctrines and procedures of shipboard fire fighting for the situation given and resources available.

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Standard
		(cont'd) support a realistic scenario or simulation),		
		Aboard a ship of 500 ITC or more at sea or in port, or in simulated shipboard conditions, given the ship's fire and emergency plans and procedures* and having one or more fire parties fighting one of the following (simulated) fire scenarios: (1) a cargo-hold fire, (2) an engine-room fire, (3) a galley fire, or (4) a living-space fire (*in cases of shore-side evaluation using simulated conditions, these documents would be developed to support a realistic scenario or simulation),	the candidate will plan, execute, and evaluate (critique) a fire drill for controlling and extinguishing the type of fire given.	The drill, plan, execution, and evaluation (critique) (1) are consistent with ship's fire and emergency plans and procedures, (2) make fire-party assignments consistent with training and physical abilities of personnel, (3) include specific performance goals and standards for acceptable versus unacceptable drill execution, and (4) employ strategy and tactics consistent with accepted doctrines and procedures of shipboard fire fighting for the situation given and resources available.
Inspect and service fire-detection and fire-extinguishing systems and equipment.	*Fire-detection systems; fixed fire-extinguishing systems; portable and mobile fire-extinguishing equipment including appliances, pumps, and rescue, salvage, life support, personal protective, and communication equipment**	Aboard a ship of 500 ITC or more at sea or in port, or in simulated shipboard conditions, equipped with the following: (a) a fire-detection system; (b) a CO_2 flooding system; (c) a fixed fire-extinguishing system; (d) mobile and portable fire extinguishers; (e) a fire-alarm system; (f) a fire-main system including hydrants, hoses, and nozzles; (g) a fire pump; (h) a submersible or de-watering pump; (i) a fire-fighter's outfit; (j) a breathing apparatus, and (k) a	when asked to simulate the inspection and service of each system, the candidate will demonstrate and describe the proper inspection and service requirements of each system or piece of equipment without actually activating, de-activating, or disabling any system or item of equipment.	Descriptions and demonstrations of inspection and service requirements are complete and correct, in accordance with applicable manufacturers' instructions, standard operating procedures, fire and emergency plans, safety procedures, and good practice; No safety violations are observed, and no system is activated, de-activated, or otherwise disabled as a result of the demonstration.

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Standard
		(cont'd) portable two-way radio, and given a precautionary safety warning on the dangers of, and safeguards to prevent, accidental activation of extinguishing systems and deactivation of fire-detection and fire-extinguishing systems,		
		Aboard a ship of 500 ITC or more at sea or in port, or in simulated shipboard conditions, equipped with: (a) a fire-detection system; (b) a CO_2 flooding system; (c) a fixed-fire extinguishing system; (d) mobile and portable fire extinguishers; (e) a fire-alarm system; (f) a fire-main system including hydrants, hoses, and nozzles; (g) a fire pump; (h) a submersible or de-watering pump; (i) a fire-fighter's outfit; (j) a breathing apparatus, and (k) a portable two-way radio, and given a precautionary safety warning on the dangers of, and safeguards to prevent, accidental activation of extinguishing systems and deactivation of fire-detection and fire-extinguishing systems,	when asked to simulate the activation and operation of each system, the candidate will demonstrate and describe the proper means to activate and operate each system or piece of equipment without actually activating, de-activating, or disabling any system or item of equipment.	Descriptions and demonstrations of ways to activate and operate each system or piece of equipment are complete and correct, in accordance with applicable manufacturers' instructions, standard operating procedures, fire and emergency plans, safety procedures, and good practice; No safety violations are observed; and no system is activated, de-activated, or otherwise disabled as a result of the demonstration.

Competence	Knowledge, understanding and proficiency	Performance Condition(s)	Performance Behavior	Performance Standard
Investigate and compile reports on incidents involving fire.	*Assessment of cause of incidents involving fire**	In a mockup of a shipboard fire or in a facility that trains using live fires, when presented with the remains of a small, typical shipboard fire (consistent with that of a ship of 500 ITC or more) for which the point(s) of origin and cause are unknown,	the candidate will describe, using burn patterns; charred debris; material and structural damage, discoloration and distortion; and other physical evidence, the process of determining the point(s) of origin of the fire.	Descriptions of physical evidence are relevant to determining the point(s) of origin; Process continually eliminates areas that are not the point(s) of origin; The point(s) of origin is identified correctly and completely.
		In a mockup of a shipboard fire or in a facility that trains using live fires, when presented with the remains of a small, typical shipboard fire (consistent with that of a ship of 500 ITC or more) for which the point(s) of origin is given and cause is unknown,	the candidate will describe while using burn patterns; charred debris; material and structural damage, discoloration and distortion; and other physical evidence and reports to determine the cause of the fire.	Descriptions of physical evidence are relevant to determining the cause; The cause of the fire is identified completely and correctly.
		In a mockup of a shipboard fire or in a facility that trains using live fires, when presented with the remains of a small, typical shipboard fire (consistent with that of a ship of 500 ITC or more) for which the point(s) of origin and cause are given,	the candidate will evaluate the point of origin, the cause, and any other relevant reports or eye-witness accounts, and describe at least one effective countermeasure.	The countermeasure(s) is (are) effective in preventing, containing, mitigating, or controlling fires having the same origin and cause in similar circumstances.

** Indicates a proficiency from Table A-VI/3*