



Report to the Subcommittee on Coast
Guard and Maritime Transportation,
Committee on Transportation and
Infrastructure, House of Representatives

January 2017

COAST GUARD

Most Training Providers Expect to Implement Revised International Maritime Standards by the Deadline Despite Challenges

GAO Highlights

Highlights of [GAO-17-40](#), a report to the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives

Why GAO Did This Study

Merchant mariners operate U.S. commercial ships and support national defense in emergency and war. Coast Guard issues regulations and policies to ensure merchant mariners are credentialed and meet minimum international standards. To incorporate changes made to the international STCW Convention in 2010, Coast Guard issued regulations in December 2013 that training providers must implement by January 1, 2017, to ensure mariners meet the revised requirements. These changes are intended to help reduce the risk of accidents in U.S. and international waters.

GAO was asked to review Coast Guard and training providers' implementation of the revised STCW requirements. This report addresses (1) the extent to which Coast Guard provided sufficient guidance to training providers about the revised STCW requirements; (2) the progress training providers report in implementing the revised STCW requirements; and challenges reported in doing so; and, (3) the extent to which Coast Guard evaluated costs and benefits of the revised STCW requirements, and impacts training providers report about the costs and benefits of implementing the revised requirements. GAO conducted a web-based survey from March 2016 to June 2016 of all 167 Coast Guard-approved STCW training providers. Eighty-one percent responded, although response rates varied for individual questions. GAO also reviewed Coast Guard's guidance and reports and interviewed officials.

GAO is not making recommendations.

View [GAO-17-40](#). For more information, contact Jennifer Grover at (202) 512-7141 or groverj@gao.gov.

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Most Training Providers Expect to Implement Revised International Maritime Standards by the Deadline Despite Challenges

What GAO Found

Most training providers (80 percent) who responded to GAO's survey reported that they were satisfied with guidance the U.S. Coast Guard (Coast Guard) provided to assist them in implementing the revised International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) requirements. However, 58 percent of respondents, including state maritime academies, private for-profit colleges, and others, reported that the lack of timely Coast Guard guidance for developing a quality assurance process—Quality Standards System (QSS)—affected their ability to implement the revised STCW requirements. A QSS is intended to ensure that training providers have a documented quality system in place to monitor training activities. Coast Guard officials said the agency plans to meet with industry stakeholders in March 2017 to discuss whether additional QSS guidance is necessary.

Most of the training providers (81 percent) who responded to GAO's survey reported that they plan to meet the January 1, 2017, deadline to implement the revised STCW requirements, but also reported some challenges in doing so. For example, over half of the respondents (54 percent) reported that interpreting the revised STCW requirements was a challenge. To address this issue, Coast Guard has ongoing outreach efforts to obtain feedback from training providers, help them interpret Coast Guard's regulations, and determine what additional guidance is needed. Almost half of the respondents (46 percent) reported that recruiting qualified course instructors was a challenge. However, Coast Guard stated that the revised requirements related to instructor's qualifications have not changed substantially; therefore, the challenge experienced with recruiting instructors may be related to specific training providers, rather than to the revised STCW requirements. Training providers not expecting to meet the deadline for implementing the revised STCW requirements (19 percent) provided various reasons, such as a lack of funding to address the requirements, needing additional Coast Guard guidance, or lacking the time to complete the required documentation.

Coast Guard evaluated the costs and benefits of the revised STCW requirements, and training providers who responded to GAO's survey reported related impacts of implementing the revised requirements. For example, Coast Guard evaluated the average costs to training providers for developing a QSS and the costs for conducting STCW audits. About half of the surveyed training providers expected their costs would be similar to Coast Guard's estimates. About one third anticipated incurring costs higher than the Coast Guard's average estimate due to needing more time for administrative tasks than Coast Guard allowed or purchasing additional training equipment. Coast Guard officials said they estimated average costs, and therefore did not consider specific items that particular training providers may need. Over half of training providers agreed with Coast Guard's assessment of potential benefits from the revised STCW requirements, such as increased vessel safety, with most of the remaining providers expecting no effect from the STCW changes.

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Abbreviations

CFR	Code of Federal Regulations
Coast Guard	U.S. Coast Guard
DHS	Department of Homeland Security
DOT	Department of Transportation
GAO	Government Accountability Office
IMO	International Maritime Organization
MAC	Maritime Academy Council
MARAD	Maritime Administration
MERPAC	Merchant Marine Personnel Advisory Committee
NMC	National Maritime Center
NPRM	Notice of Proposed Rulemaking
NVIC	Navigation and Vessel Inspection Circular
OICNW	Officer in Charge of a Navigational Watch
OMB	Office of Management and Budget
QSS	Quality Standards System
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
USMMA	U.S. Merchant Maritime Academy

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January 31, 2017

The Honorable Duncan Hunter
Chairman
The Honorable John Garamendi
Ranking Member
Subcommittee on Coast Guard and Maritime Transportation
Committee on Transportation and Infrastructure
House of Representatives

The U.S. merchant marine—the commercial ships of the United States and the mariners who operate them—is a critical component of the U.S. freight transportation sector and contributes billions of dollars to the country's national output. The merchant marine also supports national defense by providing ships and mariners to the U.S. military in times of national emergency and war. Proper education and training of mariners is important to the success of the merchant marine.

The U.S. Coast Guard (Coast Guard) within the Department of Homeland Security (DHS) is charged with issuing regulations and policies related to merchant mariner credentialing and licensing—including ensuring those who are credentialed meet the minimum international standards established by International Maritime Organization's (IMO) conventions.¹ To incorporate the 2010 amendments to the IMO's Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Convention, Coast Guard issued a final rule on December 24, 2013 (referred to as the STCW final rule).² To be consistent with the international standards, the revised STCW requirements must be fully implemented by January 1,

¹The IMO is a specialized agency of the United Nations with the responsibility to develop and maintain a regulatory framework for worldwide shipping. The result is a body of international conventions, supported by hundreds of recommendations governing every facet of shipping—including safety, environmental concerns, legal matters, technical co-operation, maritime security, and the efficiency of shipping.

²*Implementation of the Amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, and Changes to National Endorsements*, 78 Fed. Reg. 77,796 (Dec. 24, 2013). Coast Guard issued the STCW final rule to incorporate the 2010 amendments to the STCW convention that came into force on January 1, 2012. In addition, the STCW final rule made other changes not required by STCW but intended to reorganize, clarify, and update the regulations. Signatories to the 2010 STCW amendments include Australia, Canada, France, Germany, Norway, Russia, Sweden, and the United Kingdom, among others.

2017. In general, the revised STCW implementation process consists of activities such as ensuring that instructors obtain additional training, providers update the training curriculum to reflect the revised STCW requirements, and providers develop a quality assurance policy, among other things. About 60,000 U.S. mariners, 316 owners and operators of 1,044 U.S. flag vessels, and 167 STCW maritime training providers will be affected by the revised STCW requirements. The maritime training providers affected include one federal academy, six state maritime academies, and 160 non-academy training providers that offer Coast Guard-approved maritime courses.³

Implementation and enforcement of the STCW requirements is intended to reduce the risk of human errors onboard ships that could potentially lead to accidents in U.S. and international waters. Over 90 percent of ships visiting U.S. waters are foreign-flag vessels carrying multinational crews that are subject to STCW. The STCW final rule is intended to strengthen U.S. authority to enforce the STCW convention and code against foreign-flag vessels in U.S. waters.⁴ Similarly, Coast Guard officials noted that it is important that all U.S. flagged seagoing vessels visiting foreign ports employ only mariners who are fully compliant with the STCW requirements because doing so prevents U.S. flagged vessels from being detained while docked in foreign ports.

In 2014, we reviewed the availability of maritime training, the availability of financial assistance for maritime training, and Maritime Administration (MARAD) actions to ensure mariners meet commerce and defense needs and industry stakeholder views on those actions. We found that the costs associated with required maritime training—whether borne by the mariners or by entities such as federal agencies—vary depending on the

³Coast Guard along with the Maritime Administration, within the Department of Transportation, approves and oversees the six state maritime academy training programs, which consist of the (1) California Maritime Academy; (2) Great Lakes Maritime Academy; (3) Maine Maritime Academy; (4) Massachusetts Maritime Academy; (5) State University of New York Maritime College; and (6) Texas A&M at Galveston Maritime Academy. The state maritime academies along with the U.S. Merchant Maritime Academy (USMMA)—a federal service academy—educate and graduate licensed merchant marine officers who support the U.S. marine transportation and defense needs in peace and war. Non-academy training providers include, for example, public and private for profit colleges, unions, and private firms (generally includes for profit organizations).

⁴78 Fed. Reg. at 77,796.

type of training and the training provider.⁵ For example, at that time several stakeholders estimated that the cost of Coast Guard-required entry-level mariner training—including basic safety training and other up-front costs for required physical exams and drug tests—ranged from about \$1,500 to \$3,000. In another example, a large private-training provider reported that one week of training—mostly designed for current mariners seeking to advance their careers or keep up with training requirements—cost about \$1,300 per mariner. Based on our 2014 analysis, we found that for prospective mariners enrolled in their first year at state maritime academies, tuition, fees, and room and board costs for an in-state mariner could be as high as \$29,000 or as low as \$19,000 per year, depending on the academy.

Maritime training providers have raised questions in testimony to Congress and in comments to the proposed STCW rule regarding the guidance Coast Guard has provided to them and the cost of implementing the new STCW requirements.⁶ You asked us to review the guidance Coast Guard issued that is intended to assist training providers with addressing the revised STCW requirements as well as the providers' progress in implementing the revised requirements. In this report, we address the following questions:

1. To what extent has Coast Guard provided sufficient guidance to training providers about addressing the revised STCW requirements?
2. What progress do training providers report in implementing the revised STCW requirements, and what challenges, if any, have they reported in doing so?
3. To what extent has Coast Guard evaluated the costs and benefits of the revised STCW requirements, and what impact, if any, do training

⁵GAO, *U.S. Merchant Marine: Maritime Administration Should Assess Potential Mariner Training Needs*, [GAO-14-212](#) (Washington, D.C.: Jan. 31, 2014). We recommended that MARAD study and identify potential problems in ensuring that U.S. mariners are adequately trained to meet the needs of the entire maritime industry. The Department of Transportation did not agree or disagree with the recommendation.

⁶See, for example, Testimony of Rear Admiral Richard G. Gurnon, USMS, President, Massachusetts Maritime Academy, representing the Consortium of State Maritime Academies before the Subcommittee on Coast Guard and Maritime Transportation of the House Transportation & Infrastructure Committee, U.S. House of Representatives, September 10, 2013. Rear Admiral Gurnon testified that since STCW implementation, there has been an ever-increasing layered set of requirements and policy that when taken collectively are onerous and in many cases considered unnecessary—resulting in unfunded mandates and higher costs for the state maritime academies.

providers report regarding the costs and benefits of implementing the requirements?

To address our three objectives, we conducted a web-based survey—from March 21, 2016, to June 10, 2016—of the universe of 167 Coast Guard-approved maritime training providers to obtain their perspectives on Coast Guard’s guidance, their progress implementing the revised STCW requirements, and any costs and benefits of the new requirements. Our survey response rate was 81 percent, with 136 respondents answering the survey. Of the 136 who responded, 10 indicated that they did not teach any STCW-related courses; as a result, these providers were excluded from our analysis leaving 126 respondents for consideration.⁷ Not every survey respondent answered every question, so the survey response rate varies by question.

We interviewed selected STCW training providers, specifically the federal and six state maritime academies, two private providers, and Coast Guard officials responsible for maritime training. We visited two of the state academies Coast Guard recently audited for insight on Coast Guard’s assessment of their progress in implementing STCW revisions. We also visited the two private training providers, selected based on proximity to the maritime academies we visited. While our survey represents the entire population of STCW training providers who responded, our interviews with training providers are not generalizable, but are used to elaborate on some of the areas discussed in the survey.

To determine the extent to which Coast Guard has provided sufficient guidance to the training providers about addressing the revised STCW requirements, we analyzed the training providers’ assessments of sufficiency in their survey responses regarding Coast Guard guidance.⁸ We also analyzed Coast Guard and MARAD documents, including applicable Coast Guard training and audit guidance and reports, correspondence with training providers, and Coast Guard’s STCW final

⁷In reporting on survey results, the following indefinite qualifiers are used to describe specific percent of responses—almost all (99 to 88 percent); most (87 to 55 percent); about half (54 to 46 percent); and some (45 to 10 percent).

⁸For example, we asked the survey respondents if Coast Guard’s guidance on the issuance of medical certificates, among other requirements, based on the revised STCW regulations was considered to be in the following response categories: very sufficient, somewhat sufficient, or insufficient.

rule.⁹ Additionally, we reviewed Coast Guard's applicable Navigation and Vessel Inspection Circulars (NVIC), which Coast Guard provided as guidance to assist training providers with implementing the STCW requirements.¹⁰ During our interviews with selected training providers we discussed their experiences with Coast Guard guidance for implementing the revised STCW requirements. We also discussed Coast Guard's audit recommendations to the maritime academies with Coast Guard officials to confirm our understanding of the recommendations as well as the survey responses from training providers regarding STCW guidance and obtained Coast Guard's plans for any future guidance.

To describe what progress training providers have reported and any challenges in implementing Coast Guard's regulations for addressing the revised STCW requirements, we analyzed related survey responses regarding progress and challenges. We also analyzed Coast Guard's findings from its recent audits of the federal and state maritime academies to determine the Coast Guard's assessment of maritime academies' progress in implementing the revised STCW requirements.¹¹ We also interviewed Coast Guard officials to obtain their perspectives on training providers' progress and challenges—including the extent to which the agencies are addressing any challenges reported by the training providers in our survey. We also discussed STCW implementation progress and challenges during our interviews with selected training providers.

To determine the extent to which Coast Guard has evaluated the costs and benefits of implementing its regulations for addressing the revised STCW requirements, we analyzed relevant documentation such as Coast Guard's regulatory impact analysis and comments from training providers and other stakeholders on the proposed rule and reviewed the STCW final rule. We also interviewed Coast Guard officials to determine whether the STCW final rule includes key elements for assessing costs and

⁹Coast Guard's audits of the federal and state maritime academies evaluated the academies' progress in addressing Coast Guard's regulations for implementing the revised STCW requirements—including identifying any non-conformities regarding adherence to requirements.

¹⁰NVICs provide detailed guidance about the enforcement or compliance with federal marine safety regulation(s) and Coast Guard marine safety programs.

¹¹We reviewed Coast Guard's final audit reports for the federal and state maritime academies completed from March 2015 through April 2016.

benefits in federal rulemaking.¹² We analyzed cost and benefit results from our survey and discussed those issues and their impact in our interviews with selected training providers. For a more detailed discussion on our scope and methodology, see appendix I.

We conducted this performance audit from September 2015 to January 2017, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

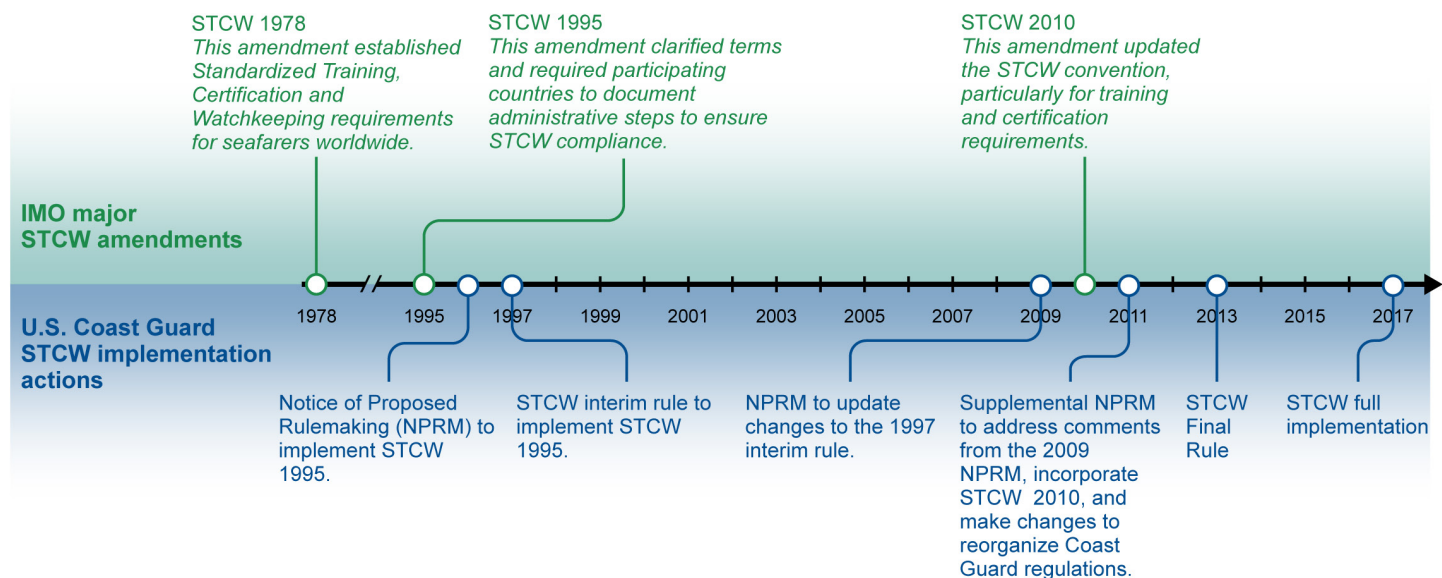
Coast Guard is the federal agency responsible for oversight of U.S. merchant marine credentialing and licensing. As part of these responsibilities, Coast Guard develops credentialing regulations based on statutory requirements and international treaties developed under the auspices of the IMO, to which the United States is a party. Coast Guard also drafts policies to clarify implementation of its regulations for training providers and mariners. Coast Guard issues guidance for complying with its regulations, including STCW requirements, through the publication of NVICs. Coast Guard implements the requirements for the issuance of merchant mariner credentials. Finally, Coast Guard also is to coordinate with its maritime training stakeholders to monitor U.S. efforts to implement the STCW convention.

The United States, through Coast Guard, implements provisions of the STCW convention through regulations.¹³ A timeline of IMO's major amendments to the STCW requirements since 1978 and Coast Guard's actions to implement the changes are presented in figure 1.

¹²In 2014, we reported on the key elements of a cost and benefit analysis. Four elements (purpose of the rulemaking, monetized costs, monetized benefits, and analysis of alternatives) are considered as the basic elements important to any cost and benefit analysis. GAO, *Federal Rulemaking: Agencies Included Key Elements of Cost-Benefit Analysis, but Explanations of Regulations' Significance Could Be More Transparent*, [GAO-14-714](#) (Washington, D.C.: Sept. 11, 2014). The criterion was drawn from the following—OMB, *Circular A-4: Regulatory Analysis* (Washington, D.C.: Sept. 17, 2003); Exec. Order No. 12,866, *Regulatory Planning and Review*, 58 Fed. Reg. 51,735 (Oct. 4, 1993); and general economic principles.

¹³See 46 C.F.R. subchapter B.

Figure 1: International Maritime Organization (IMO) Major Amendments to Standards for Training, Certification and Watchkeeping for Seafarers (STCW) and Coast Guard Actions to Implement Each Change



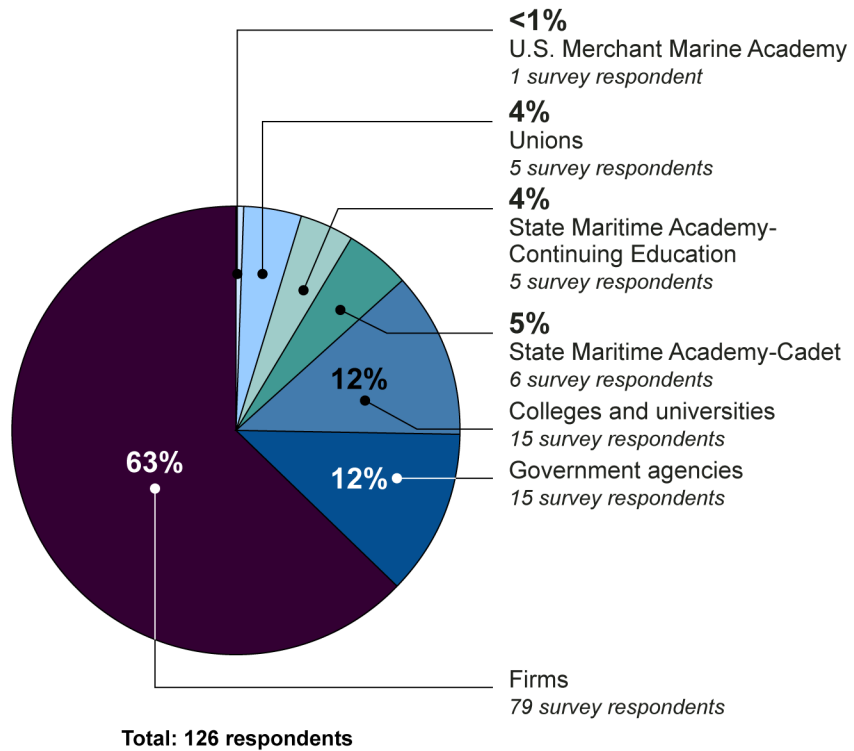
Source: GAO Analysis of STCW documentation. | GAO-17-40

Composition of STCW Training Provider Survey Respondents

As of March 2016, approximately 167 training providers were approved by Coast Guard to administer courses related to implementation of the revised STCW requirements. Out of the 81 percent of survey respondents (136 responses), 10 indicated they were not teaching STCW courses resulting in a survey sample of 126 STCW training providers.¹⁴ Not every survey respondent answered every question. As a result, response rate varied by question. Figure 2 shows the number of respondents and the types of organizations that participated in our survey.

¹⁴The USMMA and six state maritime academies offer a maritime officer training program approved by Coast Guard. These consist of undergraduate education programs for students seeking to become officers in the U.S. merchant marine. In addition to the maritime officer training programs, some maritime academies offer separate undergraduate and graduate degrees along with professional mariner training. The professional mariner training is also approved by Coast Guard. Non-academy training providers—including firms, government agencies, and colleges and universities—may offer individual Coast Guard-approved courses, or in some cases comprehensive training programs.

Figure 2: Number of Respondents to GAO Survey and Types of Organizations Represented



Source: GAO. | GAO-17-40

Note: Because reporting percentages may be misleading, given the variation in size of different types of providers, we included the specific number of respondents for survey results when subgroup results are reported, or less than 100 of the 126 responded. Not every survey respondent answered every question.

Training and Certification Requirements for U.S. Mariners

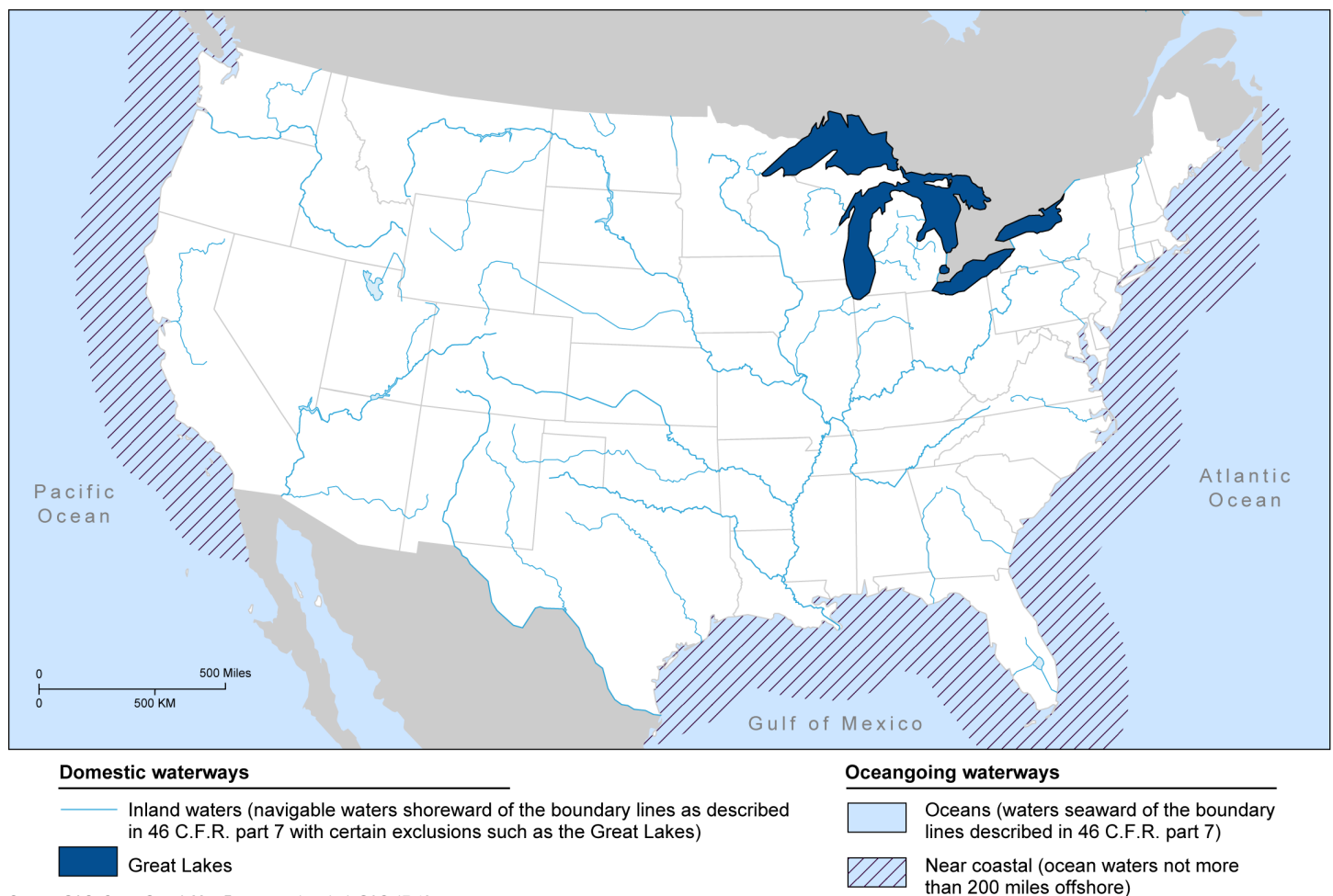
Training requirements for U.S. mariners vary depending on circumstances—such as the mariner’s role on the vessel, the area of operation, and the size of the vessel—but mariners are primarily subject to three types of training requirements:

- training required for commercial operations in both oceangoing and domestic waterways (see figure 3 for a map of these waterways);¹⁵
- military-specific training required of civilian mariners who sail aboard government-owned vessels or vessels on charter to the Department of Defense; and
- maritime company-specific training requirements.

Mariners may be certified for service in domestic waters only, but a STCW certification is required for international or oceangoing service. Under Coast Guard’s regulations, mariners can meet the training requirements for certification through a combination of experience, training with evaluation through professional examination, or a practical demonstration of skills. Figure 3 identifies the areas of operation for domestic and international certification.

¹⁵Oceangoing vessels operate between U.S. and international ports.

Figure 3: Areas of Operation for U.S. Mariners



Source: GAO; Coast Guard; Map Resources (map). | GAO-17-40

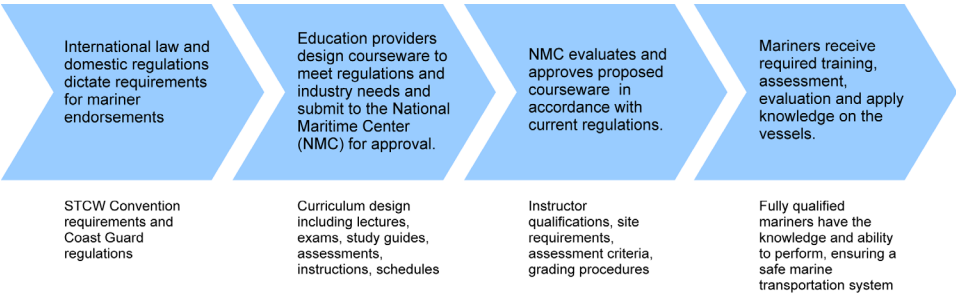
Note: According to Coast Guard officials, Alaska and Hawaii have comparable boundary lines to that of the contiguous 48 states in the United States. Both states have designated near coastal waters, and Alaska has inland waters.

The STCW certification process is intended to ensure that the training a mariner receives, and the assessment of a mariner's skills after the training is completed, supports the goal of placing qualified mariners on-board merchant vessels.

Training Provider Course and Program Approval and Audit Requirements

The Coast Guard’s National Maritime Center (NMC) approves all training providers that offer mariner training courses and programs, including programs at the federal and state maritime academies. NMC is also responsible for oversight of Coast Guard approved maritime training programs to ensure that maritime training providers offering Coast Guard approved training are performing their duties in a manner that meets all regulatory and policy standards. Figure 4 provides an overview of Coast Guard’s maritime training course approval request process—application to issuance.

Figure 4: Coast Guard’s Maritime Training Course Approval Request Process



Source: U.S. Coast Guard. | GAO-17-40

Coast Guard approves maritime training courses and is to audit training provider compliance with STCW requirements every 5 years. Coast Guard also requires providers to conduct an internal audit in the interim every 2 and a half years. According to Coast Guard officials, in 2013, the federal and state maritime academies received approval of their training programs for compliance with the 2010 STCW amendments. The officials added that Coast Guard is currently in the process of the first audit cycle subsequent to those approvals—the federal and five state maritime academies had been audited by Coast Guard as of November 2016.

STCW Training Providers We Surveyed Reported Satisfaction with Coast Guard Guidance, but Reported Delay in Quality Assurance Guidance May Affect STCW Implementation

Coast Guard Has Provided Guidance to Training Providers Through Outreach Activities and Guidance Documents

Coast Guard has provided guidance to training providers to implement the revised STCW requirements generally in two ways. First, Coast Guard conducted various outreach activities, including:

- Publishing online resources such as webinars and a frequently asked questions page. For example, prior to issuing the STCW final rule, Coast Guard convened an STCW Policy Advisory Council to solicit questions from the maritime industry regarding the revised STCW requirements, and Coast Guard used this feedback to develop the frequently asked questions page.
- Managing a call center that is available to training providers and mariners to answer questions about the revised STCW requirements, among other things.
- Holding advisory committee and maritime stakeholder meetings. For example, the Merchant Marine Personnel Advisory Committee (MERPAC) consists of about 19 members with expertise across the maritime industry and advises the Secretary of Homeland Security regarding merchant mariner credentialing issues, among other things.¹⁶ MERPAC is required to hold public meetings at least twice

¹⁶MERPAC advises the Secretary of Homeland Security, via the Commandant of Coast Guard, on matters relating to training, qualification, licensing, certification and fitness of seamen in the merchant marine. The committee acts in an advisory capacity pursuant to the Federal Advisory Committee Act.

per year, and Coast Guard has used MERPAC meetings as a forum for discussing the revised STCW requirements. The Maritime Academy Council (MAC) consists of senior administrators from state maritime academies, and Coast Guard has used MAC meetings to discuss the revised STCW requirements, among other things.¹⁷ Coast Guard officials said that MERPAC and MAC are collaborative mechanisms used to provide stakeholders with an opportunity to provide recommendations to Coast Guard. The officials also reported that Coast Guard invited all of the STCW training providers to two public meetings in 2011 to provide details and answer questions on the revised STCW requirements.

Second, Coast Guard has issued guidance documents intended to aid training providers as they implement the revised STCW requirements. Guidance documents include material on how to prepare for Coast Guard audits, a bridging plan for maritime academies to update their curriculum based on the revised STCW requirements, and 24 NVICs that provide clarification on the compliance with and enforcement of regulations.¹⁸ Coast Guard also provided guidance on qualifying for specific training-related STCW endorsements.¹⁹ For example, one NVIC provides guidance for the approval of training courses and programs.²⁰ According to Coast Guard officials, the NVICs were generally prepared in consultation with the maritime stakeholders through MERPAC.

¹⁷The MAC is the organizing entity the maritime academies use to communicate and coordinate with Coast Guard and MARAD on maritime related issues.

¹⁸GAO conducted a web-based survey from March 21, 2016, to June 10, 2016, and a total of 24 Coast Guard STCW-related NVICs were issued at this time. As of November 2016, Coast Guard has published 25 NVICs of its originally-planned 26 NVICs and reported plans to publish the 26th NVIC and four additional NVICs related to the revised STCW requirements. Coast Guard did not provide a time frame for publishing the remaining NVICs.

¹⁹Depending on where they decide to work and in what capacity, mariners may pursue the necessary Coast Guard endorsements. An endorsement is a statement of a mariner's qualifications, which may include the categories of officer, non-officer (referred to as a rating endorsement), and other special endorsements, such as those relating to the operation of specific types of vessels. Endorsements are affixed to a Merchant Mariner Credential much like a visa stamp on a passport. All endorsements for officer-level mariners require varying amounts of training, sea time, examination, and demonstration of proficiency. In general, both international and domestic endorsements allow the mariner to work on any vessel or engine equal in size or smaller than the endorsement they have.

²⁰See *U.S. Coast Guard, NVIC 03-14: Guidelines for Approval of Training Courses and Programs*.

Most Survey Respondents Were Satisfied With Coast Guard Guidance, but Over Half Reported that Delay in Quality Assurance Guidance May Affect STCW Implementation

Most training providers who responded to our survey reported that they were satisfied with Coast Guard's coordination and guidance efforts overall (91 of 114 respondents or 80 percent).²¹ For example,

- 21 of the 26 survey respondents that reported participating in Coast Guard's webinars were satisfied (81 percent).
- 57 of the 65 survey respondents that reported contacting Coast Guard's call center to obtain information or clarification of the revised STCW requirements were satisfied (88 percent).²²
- 29 of the 32 survey respondents that reported attending MERPAC or other advisory committee meetings to obtain information on the revised STCW requirements were satisfied (91 percent).²³

In addition, most survey respondents reported that the Coast Guard's 24 NVICs pertaining to the revised STCW requirements provided sufficient guidance and were issued in a timely manner. However, three of the six state maritime academy cadet programs (50 percent) reported being "not at all satisfied" with Coast Guard's coordination on the implementation of the revised STCW requirements. Officials from the three state maritime academies generally attributed their dissatisfaction to the unique challenges they face as 4-year degree granting institutions, and reported that they would benefit from additional guidance regarding approval of their 4-year curriculum. Coast Guard officials stated that coordination with maritime academies has been extensive and that they have consulted with and sought input from both the maritime academies and industry, including during the negotiation of the 2010 amendments to the STCW Convention and through MERPAC meetings. In addition, Coast Guard officials said they met with the training institutions, including the maritime academies, to help implement the revised requirements and that they

²¹The remaining 23 survey respondents (20 percent) reported that they were not at all satisfied with Coast Guard's overall coordination and guidance efforts.

²²Two of the 65 respondents who reported contacting Coast Guard's call center did not respond about their satisfaction with the call center.

²³These advisory committee meetings include (1) the Merchant Mariner Medical Advisory Committee, which advises the Commandant of the Coast Guard on the evaluation processes and criteria for medical certification of merchant mariners; (2) the Towing Safety Advisory Committee, which advises the Commandant of Coast Guard on matters relating to shallow-draft inland and coastal waterway navigation and towing safety; and (3) the National Offshore Safety Advisory Committee, which advises the Commandant of the Coast Guard on matters relating to the safety of the offshore mineral and energy industries.

continue to provide assistance to all training institutions. Coast Guard officials also reported plans to issue additional guidance to state maritime academies.

For more details regarding survey respondents' perspectives on the sufficiency of guidance and timeliness of the NVICs issued, see appendixes II and III.

Although most survey respondents reported that they were satisfied with Coast Guard's coordination efforts overall, most training providers also reported that they would have benefited from a more timely update of guidance on developing the required Quality Standards System (QSS).²⁴ For example, most of the training providers who responded to our survey (58 percent) reported that their ability to implement the revised STCW requirements was affected by a lack of timely guidance from Coast Guard on developing the QSS. The STCW final rule requires organizations offering training required by the STCW to be monitored by a QSS.

In 2014, Coast Guard reported plans to issue or update 26 NVICs pertaining to the revised STCW requirements. These plans included a QSS NVIC to clarify and guide training providers on how to appropriately develop a QSS. However, since Coast Guard has not developed its QSS guidance, the agency has directed training providers to the STCW final rule, which lists essential elements to be included in a comprehensive QSS.²⁵ Because Coast Guard has not developed QSS guidance, training providers reported delays in updating their training programs to meet the revised STCW requirements. For example, training providers submitted comments to Coast Guard during the proposed rulemaking noting concerns that the QSS requirements were vague and duplicated other

²⁴Under 46 C.F.R. § 10.410(f), Coast Guard approved courses, programs, and training creditable towards a STCW endorsement must meet the requirements for a QSS by January 1, 2017. The Coast Guard-monitored QSS must have a documented quality policy and quality objectives that align with the commitment by the training institution to achieve its missions and goals and maintain a manual that documents the objectives, authorities, and responsibilities that are essential controls for the implementation of the QSS, including—(1) The core procedures required to meet the missions and goals of the institution; (2) The documents necessary for effective design, planning, operation, and control for the delivery of courses meeting the regulatory requirements; (3) The filing and archiving of records so they are retrievable and legible; (4) Action taken to stop recurrence of system, process, and product nonconformity; and (5) Auditing, reviewing, and improving the performance of the training management system.

²⁵46 C.F.R. § 10.410.

quality assurance practices that training providers currently had in place. One training provider who responded to our survey reported that additional guidance was needed to ensure compliance with significant changes to QSS record keeping requirements. Other training providers reported that they would have benefited from seeing an example of a completed QSS, as well as clarification of specific aspects of the QSS requirements.

Coast Guard audits also indicate a need for additional QSS guidance. As of November 2016, four of the five audit reports for federal and state maritime academies, conducted from March 2015 to April 2016, contained recommendations or deficiencies related to QSS implementation—further highlighting the need for guidance to help training providers develop and implement a QSS.²⁶ Coast Guard also acknowledged in these audit reports that it needed to issue updated QSS guidance as soon as possible to ensure that training providers can implement their QSS by the deadline.

However, in November 2016, Coast Guard officials said that the situation may have changed since the time of our June 2016 survey, as the Coast Guard learned during the September MERPAC meeting that many training providers have successfully implemented QSS or expect to do so by the January 1, 2017 deadline. As a result, the Coast Guard plans to meet with MERPAC representatives in March 2017 to discuss whether guidance on developing the required QSS is necessary.

²⁶According to *Coast Guard's Course Oversight and Audit Program Guide*, Coast Guard may grant training providers up to 90 days to correct deficiencies, and Coast Guard may withdraw the course's approval if the deficiencies are not corrected.

Training Providers We Surveyed Generally Reported They Will Meet the STCW Implementation Deadline Despite Implementation Challenges

Most Survey Respondents Reported They Will Meet the STCW Implementation Deadline

Most of the training providers who responded to our survey reported that as of June 2016, they expect to meet the overall January 1, 2017, deadline for implementing the revised STCW requirements (81 percent). In general, the revised STCW implementation process consists of activities such as ensuring that instructors obtain additional training, providers update the training curriculum to reflect the revised STCW requirements, and providers develop a QSS, among other things. In all three categories, over half of the respondents reported that they will meet the implementation deadline for these activities. For example,

- 66 percent of respondents reported their instructors were fully trained as of June 2016, while 92 percent reported they will ensure that current instructors obtain the additional training required by the implementation deadline.²⁷
- 49 percent of respondents reported they have met the deadline for updating their curriculum to incorporate the revised STCW requirements as of June 2016, while 86 percent reported that they will have their curriculum revised by the implementation deadline.²⁸

²⁷Thirty-two percent of respondents reported that current instructors are partially trained and 2 percent reported that current instructors were not at all trained to meet the compliance requirement of the revised STCW requirements.

²⁸Forty percent of respondents reported that the curriculum is partially updated and 11 percent reported that they have not been updated to address the revised STCW requirements.

-
- 41 percent of respondents reported they have implemented the QSS requirement as of June 2016, while 83 percent reported that they will meet this requirement by the implementation deadline.²⁹

Those training providers not expecting to meet the requirements reported various reasons, including a lack of time, lack of knowledge about the new requirements, a desire to retire, or cost. For instance, two training providers stated that they were unaware of the revised requirements while one respondent reported plans to retire because the requirements are getting burdensome for the small training school.

Among the federal and state maritime academies, six of the seven academies reported that as of June 2016, they expect to meet the overall January 1, 2017, STCW implementation deadline. More specifically,

- four of five academies who responded to our question regarding instructor training reported that as of June 2016, the current instructors at their institutions will obtain the additional training required to be STCW-compliant by the deadline;
- six of seven academies reported that as of June 2016, their curriculum will be updated by the deadline; and,
- six of seven academies reported that as of June 2016, their QSS will be implemented by the deadline.

The one state academy that did not anticipate meeting the overall STCW implementation deadline indicated that the grandfathering guidelines for graduating cadets who may need to take additional classes to comply with the latest changes to the STCW requirements were insufficient. Regarding the lack of grandfathering guidelines, Coast Guard officials said that they assisted the academies with a bridging strategy to ensure that current and future students meet the new requirements and continue to work closely with all maritime academies to ensure compliance.

²⁹Forty-four percent of respondents reported that the QSS is partially implemented and 15 percent reported that the QSS was not at all implemented to address the revised STCW requirements.

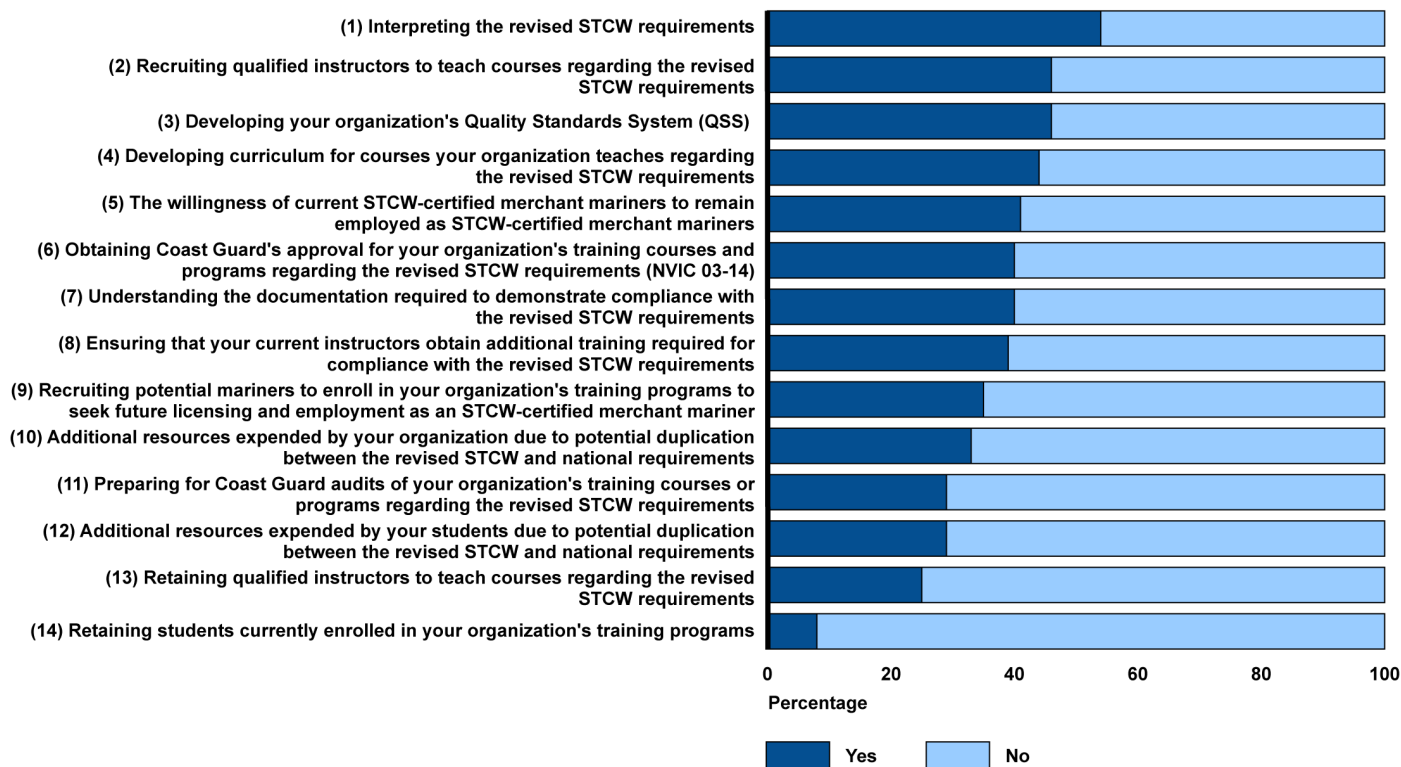
Training Providers Cited Challenges in Addressing the Revised STCW Requirements

While training providers reported progress in implementing the revised STCW requirements, they also noted various challenges in implementing these requirements. Based on survey responses in which training providers were asked to note—from a list of 14 possible implementation challenges—which challenges they faced, the most frequently reported challenges were interpreting the revised STCW requirements, recruiting qualified instructors, developing the organization's QSS, developing the program's curriculum, and mariners' willingness to remain in the industry.³⁰ With regard to developing a QSS, Coast Guard officials noted that since we concluded our survey in June 2016, when some training providers reported developing a QSS as a challenge, many of the training providers have succeeded in implementing QSS or expect to do so by the January 1, 2017, deadline. See figure 5 for the list of 14 possible implementation challenges and the training provider's views on the extent to which they considered each to be a challenge. For additional details regarding the extent to which the respondents reported experiencing challenges in implementing the revised STCW requirements, see appendix IV.

³⁰Based on interviews with officials from Coast Guard, MARAD, and other selected maritime training stakeholders (i.e., academies, unions, and associations), we identified 14 possible challenges that providers may experience when implementing Coast Guard's regulations for addressing the revised STCW requirements.

Figure 5: Standards for Training, Certification and Watchkeeping for Seafarers (STCW) Implementation Challenges as Reported by Training Providers, June 2016

Potential challenge due to the revised STCW requirements



Source: GAO. | GAO-17-40

Note: A total of 126 survey respondents reported that they are STCW training providers, but not all of these training providers responded to each question.

Interpreting the revised STCW requirements: The most frequently reported challenge by survey respondents was interpreting Coast Guard's revision of the STCW requirements with 54 percent of survey respondents reporting this as a challenge. Six survey respondents reported that Coast Guard's STCW guidance intended to help training providers interpret the revised requirements is hard to understand and according to one provider, puts undue burden on providers to remain compliant. Another training provider stated that the lack of "plain-language" guidance creates a challenge, especially for small schools that might not have the resources or sophistication to understand the language in the IMO convention or the regulation. Furthermore, of the training providers who reported that they sought clarification on the requirements from resources such as the Coast Guard's call center, five

respondents reported receiving ambiguous or conflicting information, one stated that representatives would read the guidance documents rather than provide explanations, and another stated that the representatives are more proficient in credentialing requirements rather than STCW requirements. When we asked Coast Guard about these challenges, officials responded that in addition to revising the NVICs based on training provider feedback, they also prepared responses for individual questions and have outreach activities planned as Coast Guard seeks to provide clarification to the providers.

State maritime academies also reported challenges interpreting the revised STCW requirements. For example, officials from one state maritime academy stated that some of the revised STCW requirements became clear after they were subjected to a Coast Guard audit. Furthermore, other state maritime academy officials we interviewed stated that Coast Guard's guidance does not offer much assistance to academies; as a result, the academies should be given separate STCW guidance that takes into consideration the academic system in which they operate. When asked about these challenges noted by the state maritime academies, Coast Guard officials stated that they are determining the type of guidance necessary to assist the state maritime academies and plan to develop guidance for the maritime academies in the future.

Recruiting qualified instructors: Recruiting qualified instructors to teach STCW-related courses was the next most frequently reported challenge with 46 percent of respondents reporting it as a challenge. According to Coast Guard guidance, requesting approval of new instructors as of March 2014 should include documentation of the proposed instructor's experience, training, or evidence of the ability to use effective instructional techniques that could include train-the-trainer certification. In their survey responses, five training providers reported that these requirements have decreased the supply of qualified instructors to teach STCW courses and three reported that instructors will require higher compensation. In addition, several of the training providers reported that qualified instructors may be unaffordable to some providers or the increased costs may be passed on to the mariners seeking STCW-related training. Additionally, the supply of qualified instructors is declining, especially for engineering instructors, according to 11 training providers. Seven providers reported that the cost or time commitment required for potential instructors to acquire the additional qualifications is a challenge. In addition, one provider reported that some qualified mariners who could potentially serve as faculty may not be interested in meeting the rigorous STCW faculty requirements. Two other providers reported that some

qualified mariners may opt to take more competitive salaries at sea rather than working as instructors. The Coast Guard acknowledged the effort required for instructors to be compliant, but stated that the revised guidance has not changed substantially regarding instructor qualification and that instructors have always been expected to hold appropriate credentials to teach maritime courses. In addition, the Coast Guard officials stated that they are unable to speak to the challenge of recruiting qualified instructors for any specific training providers.

Developing QSS: Almost half of the training providers—46 percent—reported that developing the organizations’ QSS was a challenge to meeting the deadline. One provider reported that due to the QSS development cost, it will not develop such a system and therefore may lose its STCW training status. Six providers reported that they believe the QSS requirement is an unnecessary administrative burden and expense to the providers, especially for small providers that may stop offering STCW courses because of the cost that may be associated with developing a QSS, according to a maritime professional. Two survey respondents also stated that they were reluctant to dedicate resources to developing a QSS because it was unclear at the time of our survey what would be required to be fully compliant. In addition, most state maritime academy officials we interviewed reported that a QSS is redundant since the academy’s accreditation status already ensures the quality of the maritime training programs. With regards to cost, Coast Guard officials stated that any cost incurred from developing a QSS is dependent on the provider since the process requires documenting what providers do to ensure program quality and compliance. According to Coast Guard officials, regarding the redundancy of a QSS, the maritime academies provided this comment during the development of the STCW final rule and in response text was added to the regulation to enable the Coast Guard to take accreditation body requirements into account when assessing compliance with applicable QSS requirements. As of November 2016, the Coast Guard is developing the policy to implement this regulatory flexibility for the maritime academies. In addition, Coast Guard officials stated that potential guidance may result after Coast Guard explores how the accreditation process could be used to fulfill the QSS requirements.

Developing curriculum: Based on our survey, 44 percent of respondents reported that developing curriculum to meet the revised STCW requirements is an implementation challenge. For example, three providers reported that the curriculum development process related to STCW requirements is arduous, vague, or expensive. Two providers

reported that having a sample curriculum related to STCW requirements would be helpful. In addition, one provider reported that academies needed more time to implement the STCW requirement changes within their academic systems to accommodate the needs of the cadet. When asked about this challenge, Coast Guard officials acknowledged there can be costs associated with curriculum development, but noted that the Coast Guard STCW regulation and policy guidance issued in January 2014 match the standards set by the IMO.

Willingness to stay in the industry: According to some survey respondents, the effort required by mariners to comply with the revised STCW requirements may result in some mariners leaving the industry. Forty-one percent of the survey respondents reported that the willingness of STCW-certified merchant mariners to remain employed in the industry following the revised STCW requirements poses a challenge. In the narrative responses, ten training providers reported that more mariners may leave the industry or are looking for other employment options because it is too difficult to maintain a merchant mariner credential under the revised requirements. Training providers we interviewed also stated that some mariners are opting to retire rather than meeting the new requirements. Three narrative responses also noted that maintaining the credential is expensive because of the cost of training, cost of travel to attend training including lodging expenses, as well as the corresponding loss of wages experienced when mariners are not at sea while they attend training. Two survey respondents indicated that sometimes mariners pay these costs out of pocket or some costs may be covered by unions. When we asked about the challenge of mariner's willingness to stay in the industry, Coast Guard officials stated that the guidance provides the minimum standards required of mariners and they have the flexibility to choose the courses or programs they wish to take. Coast Guard also acknowledged that some mariners may gravitate towards professions that give greater flexibility to their schedule and work-life balance.

In addition to the challenges listed in the survey, survey respondents identified other challenges in their narrative responses, including the need for better harmonization of the Coast Guard's training for domestic waterways and the STCW requirements. One provider reported that it has to use resources to cross-check both requirements to ensure that its program is accurate and in agreement. Academy officials we interviewed also reported that the overlapping of the domestic and STCW requirements is a strain on the time and resources of the academies. Coast Guard officials responded that in cases where a specific topic

meets both a domestic and STCW requirement, it is only required to be done once and documented as meeting the STCW requirement.

Coast Guard Assessed Costs and Benefits of STCW Implementation, and Training Providers We Surveyed Reported Varying Perspectives on STCW Costs and Benefits

Coast Guard Assessed Costs and Benefits in Accordance with Key Practices for Federal Rulemaking

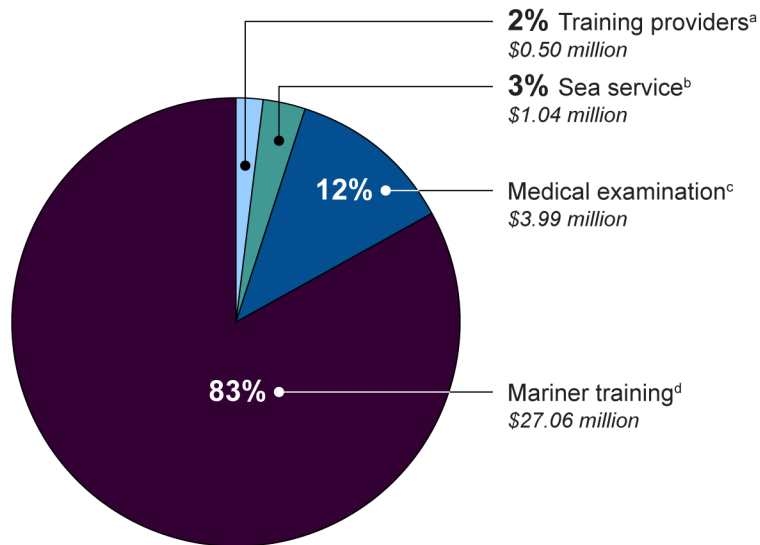
Coast Guard estimated the costs and benefits of implementing the revised STCW requirements in its regulatory analysis of the STCW final rule. Costs and benefits are two of the four elements that the Office of Management and Budget and GAO have identified as important to any regulatory assessment for federal rulemaking, and based on our analysis, Coast Guard's rulemaking for implementing STCW regulatory revisions addressed all four elements.³¹ Coast Guard estimated the total present value cost of implementing the revised STCW requirements over 10 years to be \$228.9 million, or about \$32.6 million annually.³² Coast Guard

³¹The four key elements include: (1) the identification, quantification, or monetization of costs, (2) the identification, quantification, or monetization of benefits; (3) a discussion of the problem the rule intends to address; and (4) a discussion of alternatives to the final rule that the agency considered. See OMB Circular A-4: *Regulatory Analysis* (Sept. 17, 2003); and GAO, *Federal Rulemaking: Agencies Included Key Elements of Cost-Benefit Analysis, but Explanations of Regulations' Significance Could be More Transparent*, [GAO-14-714](#) (Washington, D.C.: Sept. 12, 2014). GAO's criteria were developed by reviewing regulatory rulemaking policies, including OMB's circular (which identifies the 4 elements) and standard economic principles.

³²Coast Guard estimated these costs using a 3 percent and 7 percent discount rate. In order to compute net present value, costs are discounted to reflect the time value of money. Benefits and costs are worth more if they are experienced sooner. Coast Guard's STCW final rule included discount rates of 7 and 3 percent. We used the 7 percent discounted rate for illustrative purposes.

estimates included implementation costs associated with four general areas—mariner training, medical examination, sea service, and training providers. As shown in figure 6, Coast Guard estimated the majority of costs were to meet mariner training requirements.

Figure 6: Coast Guard Estimates of Annual Costs for Implementing the revised Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Requirements



Source: GAO analysis of Coast Guard data. | GAO-17-40

^aCoast Guard's cost estimates accounted for requirements that training providers must (1) have a Quality Standards System including a manual detailing procedures for training planning, scheduling and course design, verifying instructor and examiner competence, testing students' knowledge and practical skills, and tracking students' course completion; (2) store records on each student who successfully completes a course, certifying completion, and maintain the records for 5 years (an extension from the current 1-year requirement); and (3) conduct an internal mid-period audit of each Coast Guard-approved course, and report the results of the audit to National Maritime Center.

^bThe revised STCW requirements expanded the sea service hours that mariners are required to obtain for certain endorsements, specifically mariners applying for a master endorsement. This would impose new costs upon mariners who would have previously earned these license upgrades more quickly.

^cThe revised STCW requirements reduced the validity period for mariner medical certifications from 5 years to 2 years, resulting in more frequent medical examinations for STCW mariners to meet vision, hearing, general medical, and physical ability standards.

^dSTCW requires mariners to obtain specific training to obtain and renew specific endorsements, such as for a tankerman's assistant. (A tankerman is credentialed by the Coast Guard to supervise or assist with the transfer of liquid cargo.) Coast Guard's estimated cost to mariners for completing STCW-required courses included travel to training locations and foregone wages plus benefits.

Coast Guard also identified qualitative benefits expected from implementing the revised STCW requirements that would result from increased and consistent training and enhanced medical evaluation. Expected benefits included, for example, an increase in vessel safety and a decrease in the risk of accidents. Coast Guard officials told us that they did not quantify the benefits of implementing the revised STCW requirements because of uncertainty about the relationship between training and human factors involved in accidents. Officials stated that to estimate benefits, Coast Guard reviewed studies on the effectiveness of training in other industrial settings, but because of the difference in contexts and the range of measures of effectiveness, they concluded that the benefits transfer was not robust enough to quantify benefits for STCW. Instead, Coast Guard conducted a “break-even” analysis of the expected benefits, noting that break-even analyses are used for situations where benefits from a regulatory action cannot be quantified. Such analyses are intended to answer the question: “How small could the non-quantified benefits be before the rule would yield zero net benefits?” We describe the Coast Guard’s benefits estimates in more detail below.

Executive Order 13563 directs agencies to periodically review significant regulations to identify those that may be outmoded, ineffective, insufficient or excessively burdensome, and to modify the regulations according to what has been learned.³³ Coast Guard officials said they would consider conducting a retrospective analysis of its estimated costs and benefits of implementing the revised STCW requirements after sufficient time has passed for the costs and benefits to be realized, and if funds are available.

Survey Respondents Reported Varying Perspectives on STCW Costs and Benefits

Perspectives on Costs to Training Providers

Most training providers who responded to our survey (68 percent) reported that they anticipated that implementing the revised STCW requirements would increase their organization’s costs. About half of all

³³*Improving Regulation and Regulatory Review*, Exec. Order No. 13,563, 76 Fed. Reg. 3821 (Jan. 21, 2011).

survey respondents (49 percent) expected to increase their organization's training prices in 2017 while 37 percent expected no change in prices.

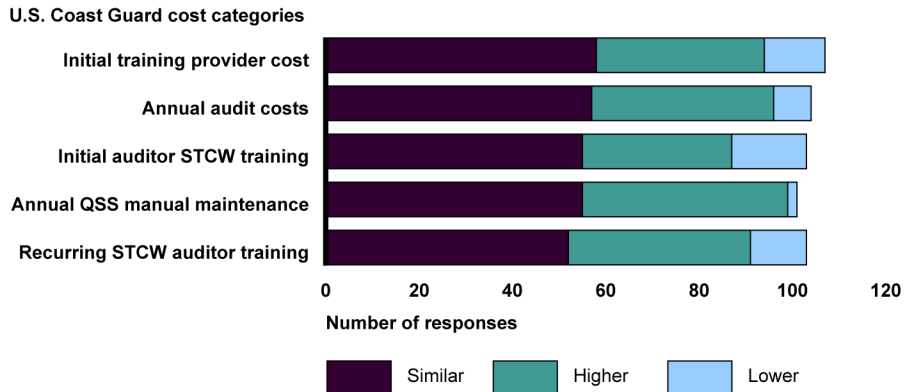
Training providers generally reported that they expected their costs of implementing STCW requirements to be equal to or higher than the Coast Guard's estimates in its regulatory analysis of the STCW final rule.³⁴ Specifically, in estimating the costs of implementing the revised STCW requirements, Coast Guard estimated average dollar costs for small and non-small training providers across five cost categories.³⁵ For example, using Coast Guard estimates, the average cost for initial auditor training—one of the five cost categories—for small providers was \$3,499 and for non-small providers was \$16,023.³⁶ Across these five cost categories, about half of responding training providers (46 to 50 percent) indicated that their costs would be similar to Coast Guard's cost estimates, as shown in figure 7 below. About a third of respondents (28 to 39 percent) expect costs to be higher than Coast Guard estimated and 2 to 14 percent anticipated costs lower than Coast Guard's estimates. In addition, a small number of providers (between 10 and 13) responded "other" to these questions. For example, one provider who indicated "other" when comparing anticipated costs to Coast Guard estimates said "our training system is much more complex than any other commercial provider" while another stated "my training school consists of a single all-in-one manager/owner/instructor."

³⁴U.S. Coast Guard, Implementation of the 1995 Amendments to the International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers, 1978, and Changes to National Endorsements, Final Rule, *Regulatory Analysis and Final Regulatory Flexibility Analysis*. USCG-2004-17914, RIN 1625-AA16, November 2011.

³⁵ Coast Guard used the Small Business Administrations' definition of small providers as those with \$7 million or less in annual receipts, and non-small providers to have over \$7 million in annual receipts.

³⁶Initial auditor training involves training selected staff to perform an internal audit of each Coast Guard approved course.

Figure 7: Training Provider Survey Respondents' Perceived Costs of Implementing the Revised Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Requirements Compared to Coast Guard's Cost Estimates



Source: GAO analysis of STCW training provider survey responses. | GAO-17-40

Note: A total of 126 STCW training providers responded to our survey, but not all training providers responded to each question.

Some survey respondents identified costs that they did not believe were included in Coast Guard's average estimates for training providers. For example, while Coast Guard included estimates for developing QSS procedures, several training providers indicated that new QSS requirements could involve more administrative time than estimated by Coast Guard. Officials at one maritime academy indicated that they allocated 9 hours per week to maintain the STCW system and believed that the Coast Guard's average estimates "did not come close to the true costs" incurred by a large training provider.³⁷ Officials at another maritime academy indicated that implementing the requirements would require "more courses, more assessments, more record keeping, more simulation." Coast Guard officials told us that they plan to consult with state academies about the perceived impacts related to implementing the requirements. A recently purchased simulator used for STCW training at a maritime academy is displayed in figure 8.

³⁷ Coast Guard assumed an average of 10 QSS procedures would be written, with 12 hours per procedure for each small training providers and 34 hours per procedure for each non-small training provider, at an hourly wage of \$36. Annual maintenance was estimated by the Coast Guard to take an average of 9 hours per provider at \$36 per hour.

Figure 8: Merchant Marine Training Simulator



Source: Texas A&M at Galveston Maritime Academy. | GAO-17-40

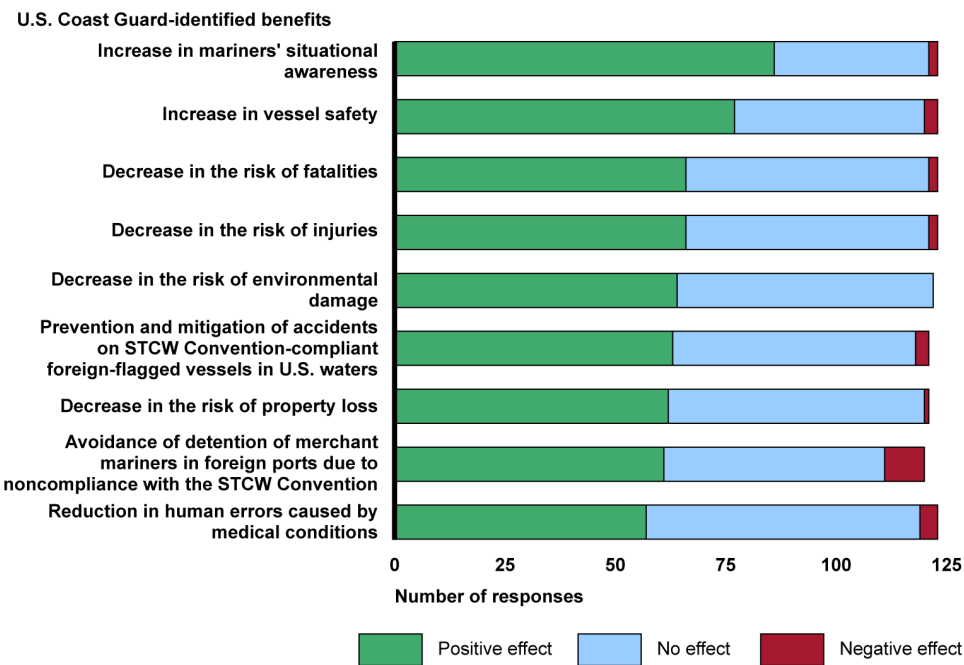
In addition to administrative costs, academy officials stated that the extra days of sea time required under the revised STCW requirements cost an additional \$7,000 a week to operate and staff the ship. Coast Guard stated that it developed its cost estimates for a typical or average entity, and therefore the costs used for estimating national effects did not include costs that a specific entity might incur. When asked for their perspectives on the training providers' view of the cost of the revised STCW requirements, Coast Guard officials stated that providers had the opportunity to comment on the Coast Guard cost estimates during the supplemental notice period and those comments were adjudicated and applicable text amended before the final rule was issued.

Perspectives on Benefits of the Revised STCW Requirements

In estimating the benefits of implementing the revised STCW requirements, Coast Guard identified nine categories of potential benefits. Across these nine categories, survey respondents were mixed in their expectation of whether there would be either a positive effect (i.e., benefits would be realized) or no effect (i.e., no benefits) from implementing the revised STCW requirements. For example, as shown in figure 9 below, 70 percent of training providers indicated that increased mariner situational awareness was a benefit of the STCW regulatory revisions. Also, between zero and nine providers across categories reported the effects might be negative, rather than provide benefits, with

one state maritime academy noting that the documentation required to demonstrate compliance with STCW—much of which has to be completed at sea—is cumbersome.

Figure 9: Survey Respondents’ Reported Expected Benefits of implementing the Revised Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Requirements



Source: GAO analysis of STCW training provider survey responses. | GAO-17-40

Note: The total of responses does not equal 126 because not all training providers responded.

Training providers varied by type of organization in their perspectives of the benefits of implementing the revised STCW requirements. For example, the U.S. Merchant Maritime Academy and most of state maritime academies’ cadet programs (4 of 6) and union training providers (3 of 5) expected that implementing the revised STCW requirements would have no effect on the potential benefit of decreasing the risk of property loss, whereas with other types of providers, such as colleges and universities, most (10 of 15) expected a positive effect from the benefit.

Agency Comments and Our Evaluation

We provided a draft of this report to DHS and the Department of Transportation (DOT) for review and comment. DHS provided technical comments, which we incorporated as appropriate. DOT had no comments on the report.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Homeland Security, and the Office of the Assistant Secretary for Administration, DOT. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-7141 or groverj@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix V.



Jennifer Grover
Director, Homeland Security and Justice

Appendix I: Objectives, Scope, and Methodology

This report focuses on the maritime training providers' perspectives on the U.S. Coast Guard's (Coast Guard) guidance available to implement the revised Standards of Training, Certification and Watchkeeping for Seafarers (STCW) requirements, their progress implementing the revised requirements, and any costs and benefits associated with implementing the new requirements. Specifically, we addressed the following questions.

1. To what extent has Coast Guard provided sufficient guidance to training providers about addressing the revised STCW requirements?
2. What progress do training providers report in implementing the revised STCW requirements, and what challenges, if any, have they reported in doing so?
3. To what extent has Coast Guard evaluated the costs and benefits of the revised STCW requirements, and what impact, if any, do training providers report regarding the costs and benefits of implementing the requirements?

To address all three objectives, we conducted a web-based survey of the universe of 167 training providers approved by the Coast Guard to teach STCW courses to obtain their perspective on each of our objectives. Coast Guard provided GAO with a list of all training providers approved to teach STCW courses, including contact information. We worked with Coast Guard and independently verified contact information, particularly e-mails (as the survey was web-based) to confirm the universe of 167 STCW training providers. We determined that this information was reliable for our purposes.

To develop our survey questions, we reviewed the STCW final rule (including comments and STCW implementation cost estimates), relevant congressional testimony, Coast Guard's guidance related to STCW implementation, and other STCW-related documents. We also discussed the survey topics with representatives from the Coast Guard, Maritime Administration (MARAD), and a maritime union. We pretested our survey with selected STCW training providers who were purposefully selected to represent a broad range of providers, including the Coast Guard Academy, a state maritime academy, a private training provider, a union

training provider, and with Coast Guard officials, and made changes for clarity as needed.¹

The survey was available for completion from March 21, 2016, through June 10, 2016, and we followed up by e-mailing or calling all participants who had not yet responded after 8 days and again every few weeks to encourage participation. Out of the universe of 167 STCW training providers, 136 responded for a response rate of 81 percent. Of those responding, 10 indicated they were not currently teaching STCW courses. As such, we removed these respondents from our sample resulting in a total population of 126 training providers teaching at least one STCW course, and subject to STCW regulatory requirements. Not all respondents answered every question so the response rate varied by question. We analyzed the numeric data with statistical software and the testimonial data with qualitative analysis software.²

Also, for all three objectives, we interviewed officials from the Coast Guard, selected training providers (including the federal and state maritime academies) and other stakeholders, including MARAD—primarily for their perspectives as we developed our survey. We also conducted interviews with Coast Guard officials responsible for maritime training to obtain their views on each of our objectives. In addition, to supplement training provider information gathered by the survey, we interviewed officials at the federal maritime academy and the state maritime academies to understand their unique perspective on implementing the revised STCW requirements. Four of the six state maritime academies and the federal maritime academy were interviewed by phone, and we conducted site visits at two state academies—Texas A&M at Galveston Maritime Academy and the Great Lakes Maritime Academy. These academies were selected because both academies had been recently audited by the Coast Guard for STCW compliance and could share what was learned from the audits. We also interviewed two private providers that were selected based on geographic proximity to the academy site visits. While our survey represents the perspectives of the

¹The state maritime academies include the (1) California Maritime Academy; (2) Maine Maritime Academy; (3) Massachusetts Maritime Academy; (4) Great Lakes Maritime Academy; (5) State University of New York Maritime College; and (6) Texas A&M at Galveston Maritime Academy.

²In reporting on survey results, the following indefinite qualifiers are used to describe specific percent of responses—almost all (99 to 88 percent); most (87 to 55 percent); about half (54 to 46 percent); and some (45 to 10 percent).

of STCW training providers who responded, our interviews with training providers are not generalizable and are used to provide illustrative examples and context about the survey responses.

To determine the extent to which Coast Guard provided sufficient guidance to training providers to implement the revised STCW requirements, we analyzed data from our survey and included relevant questions in our interviews with Coast Guard, stakeholders, and selected training providers. We reviewed and analyzed Coast Guard and MARAD documents including applicable Coast Guard training and audit guidance and reports,³ correspondence with training providers, STCW training workshop materials, the STCW final rule, and prior GAO reports.⁴ We reviewed Coast Guard's updated Navigation and Vessel Inspection Circulars (NVIC), which Coast Guard provided to training providers as guidance to assist with implementing the revised STCW requirements.⁵ In our meetings with selected STCW training providers and stakeholders we discussed their experiences implementing the revised STCW requirements and coordinating with Coast Guard and MARAD to do so. With Coast Guard, we confirmed our understanding of their audit recommendations to the respective federal and state maritime academies.

To describe the progress of training providers in implementing the revised STCW requirement and any challenges in doing so, we analyzed data from our survey and included relevant questions in our interviews with Coast Guard, stakeholders, and selected training providers. We reviewed the STCW final rule, applicable deadlines, and Coast Guard's plan for training providers to transition between the existing and revised STCW requirements. For familiarity with the process at state maritime academies, we reviewed the maritime academy handbook. To describe Coast Guard's assessment of progress made by the providers in implementing STCW revisions, we reviewed Coast Guard's internal audit

³The Coast Guard audits evaluated the federal and state maritime academies' progress in implementing the revised STCW requirements—including identifying any non-conformities regarding adherence to requirements.

⁴See for examples: GAO, *U.S. Merchant Marine: Maritime Administration Should Assess Potential Mariner-Training Needs*, [GAO-14-212](#) (Washington, D.C.: January 2014) and GAO, *U.S. Merchant Marine Academy: Additional Actions Needed to Establish Effective Internal Control* [GAO-12-369](#) (Washington, D.C.: July 2012).

⁵NVICs provide detailed guidance about the enforcement or compliance with a federal marine safety regulation(s) and Coast Guard marine safety programs.

guidance, the audit reports conducted to date for the federal and state maritime academies.⁶

For our third objective regarding Coast Guard's assessment of STCW costs and benefits, we analyzed data from our survey and included relevant questions in our interviews with Coast Guard and selected training providers. We reviewed congressional testimony, comments submitted for the Supplemental Notice of Proposed Rulemaking, and the STCW final rule to identify cost and benefit issues.⁷ We reviewed the STCW final rule and *Final Rule Regulatory Analysis and Final Regulatory Flexibility Analysis* prepared by the Coast Guard to document the agency's estimated costs and benefits of revising STCW regulations.⁸ We compared the STCW final rule to Office of Management and Budget (OMB) criteria identifying key elements for effective rulemaking, and prior GAO work.⁹ We reviewed OMB regulatory requirements, including Circulars A-4 and A-94, and prior GAO work to identify key elements in conducting a regulatory cost-benefit analysis.¹⁰

We conducted this performance audit from September 2015 to January 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to

⁶We reviewed Coast Guard's final audit reports for the federal and state maritime academies completed during the March 2015 through April 2016 time frame.

⁷Testimony of Rear Admiral Richard G. Gurnon, USMS, President, Massachusetts Maritime Academy, representing the Consortium of State Maritime Academies before the Subcommittee on Coast Guard and Maritime Transportation of the House Transportation & Infrastructure Committee, U.S. House of Representatives, Sept. 10, 2013.

⁸U.S. Coast Guard, Implementation of the 1995 Amendments to the International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers, 1978, and Changes to National Endorsements, Final Rule, *Regulatory Analysis and Final Regulatory Flexibility Analysis*. USCG-2004-17914, November 2011.

⁹In 2014, we reported on the key elements of a cost and benefit analysis. Four elements (purpose of the rulemaking, monetized costs, monetized benefits, and analysis of alternatives) are considered as the basic elements important to any cost and benefit analysis. GAO, *Federal Rulemaking: Agencies Included Key Elements of Cost-Benefit Analysis, but Explanations of Regulations' Significance Could Be More Transparent*, [GAO-14-714](#) (Washington, D.C.: Sept. 11, 2014). The criterion was drawn from the following—OMB, *Circular A-4: Regulatory Analysis* (Washington, D.C.: Sept. 17, 2003); Exec. Order No. 12,866, *Regulatory Planning and Review*, 58 Fed. Reg. 51,735 (Oct. 4, 1993); and general economic principles.

¹⁰Office of Management and Budget, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, Circular A-94, Revised, Oct. 29, 1992, and [GAO-14-714](#).

obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Survey Responses on Coast Guard Guidance

Survey Respondents' Perspectives on the Sufficiency of Coast Guard's Guidance to Implement the Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Requirements

The U.S. Coast Guard (Coast Guard) issues guidance for complying with its regulations, including STCW requirements,¹ through the publication of Navigation and Vessel Inspection Circulars (NVIC).² In 2014, Coast Guard reported plans to issue 26 NVICs pertaining to the revised STCW requirements. As of March 2016, Coast Guard had published 24 NVICs and reported plans to publish the additional NVICs pertaining to the revised STCW requirements.³ According to Coast Guard officials, the decision to publish a NVIC is based on a need to clarify a regulation and provide implementation guidance. Table 1 provides details regarding the survey respondents' perspectives on the sufficiency of Coast Guard's guidance (24 NVICs), as of June 2016 to implement the STCW requirements.

¹*Implementation of the Amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, and Changes to National Endorsements*: 78 Fed. Reg. 77,796 (Dec. 24, 2013). Coast Guard issued the STCW final rule to incorporate the 2010 amendments to the STCW Convention that came into force on January 1, 2012. In addition, the STCW final rule makes other changes not required by STCW but intended to reorganize, clarify, and update the regulations. Other signatories to the 2010 STCW amendments include Australia, Canada, France, Germany, Norway, Russia, Sweden, and the United Kingdom, among others.

²NVICs provide clarification on the enforcement of and compliance with Coast Guard's regulations as well as guidance on qualifying for specific training-related STCW endorsements.

³GAO conducted a web-based survey from March 21, 2016 to June 10, 2016. Coast Guard published a 25th NVIC "Guidelines for Credentialing Officers of Towing Vessels" on June 23, 2016, and plans to decide on whether to issue guidance on Quality Standard Systems as the 26th NVIC in early 2017. Coast Guard also plans to issue an additional four NVICs related to the revised STCW requirements.

Table 1: Survey Respondents' Responses on the Sufficiency of Coast Guard's Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Related Guidance, as of June 2016

Navigation and Vessel Inspection Circulars (NVIC) ^a	Did the NVIC provide sufficient guidance on this topic?							
	Very Sufficient		Somewhat Sufficient		Insufficient		Totals	
	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent
NVIC 01-14: Guidance on the Issuance of Medical Certificates	19	36	34	64	0	0	53	100
NVIC 02-14: Grandfathering and Transitional Provisions for Merchant Mariner Credentials	17	29	38	64	4	7	59	100
NVIC 03-14: Guidelines for Approval of Training Courses and Programs	38	41	48	52	7	8	93	100
NVIC 04-14: Guidelines for Qualification for STCW Endorsements for Proficiency in Survival Craft and Rescue Boats Other Than Fast Rescue Boats	32	50	30	47	2	3	64	100
NVIC 05-14: Guidelines for Qualification for STCW Endorsements for Proficiency in Fast Rescue Boats	27	56	21	44	0	0	48	100
NVIC 06-14: Guidelines for Qualification for STCW Endorsements as Rating Forming Part of a Navigational Watch	24	38	36	57	3	5	63	100
NVIC 07-14: Guidelines for Qualification for STCW Endorsements as Rating Forming Part of an Engineering Watch	16	33	31	63	2	4	49	100
NVIC 08-14: Guidelines for Qualification for STCW Endorsements in Basic Training (Formerly Basic Safety Training)	31	44	38	54	2	3	71	100
NVIC 09-14: Guidelines for Qualification for STCW Endorsements for Advanced Firefighting	26	46	29	52	1	2	56	100
NVIC 10-14: Master/Chief Mate 3,000 GT or More	14	33	24	57	4	10	42	100

**Appendix II: Survey Responses on Coast
Guard Guidance**

Navigation and Vessel Inspection Circulars (NVIC) ^a	Did the NVIC provide sufficient guidance on this topic?							
	Very Sufficient		Somewhat Sufficient		Insufficient		Totals	
	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent
NVIC 11-14: Master/Chief Mate 500 GT to 3,000 GT	18	41	24	55	2	5	44	100
NVIC 12-14: Officer in Charge of a Navigational Watch (OICNW)	24	43	27	48	5	9	56	100
NVIC 13-14: Master/OICNW less Than 500 GT near coastal	15	38	23	58	2	5	40	100
NVIC 14-14: Able Seafarer- Deck	19	36	29	55	5	9	53	100
NVIC 15-14: Chief Engineer/Second Engineer Officer 4,000 HP or More	11	32	20	59	3	9	34	100
NVIC 16-14: Chief Engineer/Second Engineer Officer 1,000 to 4,000 HP	9	28	20	63	3	9	32	100
NVIC 17-14: Officer in Charge of an Engineering Watch	15	34	23	52	6	14	44	100
NVIC 18-14: Able Seafarer- Engine	13	33	23	58	4	10	40	100
NVIC 19-14: Qualified Assessor	24	39	33	53	5	8	62	100
NVIC 20-14: Guidelines For Qualification For High-Speed Craft Type-Rating Endorsements	8	31	18	69	0	0	26	100
NVIC 21-14: Guidelines For Qualification For STCW Endorsements For Vessel Security Officers, Vessel Personnel With Designated Security Duties, and Security Awareness	23	40	34	59	1	2	58	100
NVIC 22-14: Guidelines For Qualification For STCW Endorsements For Officers and Ratings On Oil, Chemical, and Liquefied Gas Tank Vessels	12	32	22	59	3	8	37	100

Appendix II: Survey Responses on Coast
Guard Guidance

Navigation and Vessel Inspection Circulars (NVIC) ^a	Did the NVIC provide sufficient guidance on this topic?							
	Very Sufficient		Somewhat Sufficient		Insufficient		Totals	
	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent
NVIC 23-14: Guidelines For Qualification For STCW Endorsements As Electro- Technical Officer On Vessels Powered By Main Propulsion Machinery Of 750 kW/1,000 HP Or More	8	26	22	71	1	3	31	100
NVIC 24-14: Guidelines On Qualification For STCW Endorsements As Electro- Technical Rating On Vessels Powered By Main Propulsion Machinery Of 750 kW/1,000 HP Or More	7	26	20	74	0	0	27	100

Source: GAO | GAO-17-40

^aThe survey results are reported for training providers that responded to each specific question. As a result, the number of respondents varied for each question because not all training providers responded.

Appendix III: Survey Respondents’ Perspectives on Timeliness of Coast Guard Guidance

Survey Respondents’ Perspectives on Coast Guard’s Timeliness in Issuing Guidance to Implement the Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Requirements

The Coast Guard issues guidance for complying with its regulations, including STCW requirements,¹ through the publication of Navigation and Vessel Inspection Circulars (NVIC).² In 2014, Coast Guard reported plans to issue 26 NVICs pertaining to the revised STCW requirements. As of March 2016, Coast Guard had published 24 NVICs and reported plans to publish the additional NVICs pertaining to the revised STCW requirements.³ According to Coast Guard officials, the decision to publish a NVIC is based on a need to clarify a regulation and provide implementation guidance. Table 2 provides details regarding the survey respondents’ perspectives on Coast Guard’s timeliness in issuing guidance (24 NVICs), as of June 2016 to implement the STCW requirements.

¹*Implementation of the Amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, and Changes to National Endorsements*, 78 Fed. Reg. 77,796 (Dec. 24, 2013). Coast Guard issued the STCW final rule to incorporate the 2010 amendments to the STCW Convention that came into force on January 1, 2012. In addition, the STCW final rule makes other changes not required by STCW but intended to reorganize, clarify, and update the regulations. Other signatories to the 2010 STCW amendments include Australia, Canada, France, Germany, Norway, Russia, Sweden, and the United Kingdom, among others.

²NVICs provide clarification on the enforcement of and compliance with Coast Guard’s regulations as well as guidance on qualifying for specific training-related STCW endorsements.

³GAO conducted a web-based survey from March 21, 2016, to June 10, 2016—total of 24 Coast Guard STCW-related NVICs were issued at this time. As of December 2016, Coast Guard has published 25 of its originally-planned 26 NVICs and reported plans to publish the 26th NVIC and four additional NVICs related to the revised STCW requirements.

Appendix III: Survey Respondents'
Perspectives on Timeliness of Coast Guard
Guidance

Table 2: Survey Respondents' Perspectives on Coast Guard's Timeliness in Issuing the Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Related Guidance, as of June 2016

Navigation and Vessel Inspection Circulars (NVIC) ^a	Did Coast Guard issue this NVIC in a manner that provided you with sufficient time to implement the regulatory requirements associated with the NVIC?							
	Very Sufficient		Somewhat Sufficient		Insufficient		Totals	
	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent
NVIC 01-14: Guidance on the Issuance of Medical Certificates	20	38	31	58	2	4	53	100
NVIC 02-14: Grandfathering and Transitional Provisions for Merchant Mariner Credentials	20	34	37	64	1	2	58	100
NVIC 03-14: Guidelines for Approval of Training Courses and Programs	40	43	43	46	10	11	93	100
NVIC 04-14: Guidelines for Qualification for STCW Endorsements for Proficiency in Survival Craft and Rescue Boats Other Than Fast Rescue Boats	36	56	25	39	3	5	64	100
NVIC 05-14: Guidelines for Qualification for STCW Endorsements for Proficiency in Fast Rescue Boats	28	58	17	35	3	6	48	100
NVIC 06-14: Guidelines for Qualification for STCW Endorsements as Rating Forming Part of a Navigational Watch	23	37	34	55	5	8	62	100

**Appendix III: Survey Respondents'
Perspectives on Timeliness of Coast Guard
Guidance**

Did Coast Guard issue this NVIC in a manner that provided you with sufficient time to implement the regulatory requirements associated with the NVIC?									
Navigation and Vessel Inspection Circulars (NVIC) ^a	Very Sufficient		Somewhat Sufficient		Insufficient		Totals		
	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent	
NVIC 07-14: Guidelines for Qualification for STCW Endorsements as Rating Forming Part of an Engineering Watch	17	35	28	58	3	6	48	100	
NVIC 08-14: Guidelines for Qualification for STCW Endorsements in Basic Training (Formerly Basic Safety Training)	31	44	37	52	3	4	71	100	
NVIC 09-14: Guidelines for Qualification for STCW Endorsements for Advanced Firefighting	26	45	29	50	3	5	58	100	
NVIC 10-14: Master/Chief Mate 3,000 GT or More	15	36	25	60	2	5	42	100	
NVIC 11-14: Master/Chief Mate 500 GT to 3,000 GT	17	40	24	56	2	5	43	100	
NVIC 12-14: Officer in Charge of a Navigational Watch (OICNW)	25	47	25	47	3	6	53	100	
NVIC 13-14: Master/OICNW less Than 500 GT near coastal	15	38	23	58	2	5	40	100	
NVIC 14-14: Able Seafarer-Deck	18	35	31	60	3	6	52	100	
NVIC 15-14: Chief Engineer/Second Engineer Officer 4,000 HP or More	11	31	21	60	3	9	35	100	
NVIC 16-14: Chief Engineer/Second Engineer Officer 1,000 to 4,000 HP	9	28	20	63	3	9	32	100	

**Appendix III: Survey Respondents'
Perspectives on Timeliness of Coast Guard
Guidance**

Did Coast Guard issue this NVIC in a manner that provided you with sufficient time to implement the regulatory requirements associated with the NVIC?								
Navigation and Vessel Inspection Circulars (NVIC) ^a	Very Sufficient		Somewhat Sufficient		Insufficient		Totals	
	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent
NVIC 17-14: Officer in Charge of an Engineering Watch	17	40	22	51	4	9	43	100
NVIC 18-14: Able Seafarer-Engine	13	33	23	58	4	10	40	100
NVIC 19-14: Qualified Assessor	23	37	36	58	3	5	62	100
NVIC 20-14: Guidelines For Qualification For High-Speed Craft Type-Rating Endorsements	8	30	17	63	2	7	27	100
NVIC 21-14: Guidelines For Qualification For STCW Endorsements For Vessel Security Officers, Vessel Personnel With Designated Security Duties, and Security Awareness	23	40	32	55	3	5	58	100
NVIC 22-14: Guidelines For Qualification For STCW Endorsements For Officers and Ratings On Oil, Chemical, and Liquefied Gas Tank Vessels	11	31	22	61	3	8	36	100
NVIC 23-14: Guidelines For Qualification For STCW Endorsements As Electro-Technical Officer On Vessels Powered By Main Propulsion Machinery Of 750 kW/1,000 HP Or More	10	32	18	58	3	10	31	100

Appendix III: Survey Respondents’
Perspectives on Timeliness of Coast Guard
Guidance

Did Coast Guard issue this NVIC in a manner that provided you with sufficient time to implement the regulatory requirements associated with the NVIC?									
Navigation and Vessel Inspection Circulars (NVIC) ^a	Very Sufficient		Somewhat Sufficient		Insufficient		Totals		
	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent	
NVIC 24-14: Guidelines On Qualification For STCW Endorsements As Electro-Technical Rating On Vessels Powered By Main Propulsion Machinery Of 750 kW/1,000 HP Or More	7	26	17	63	3	11	27		100

Source: GAO | GAO-17-40

^aThe survey results are reported for training providers that responded to each specific question. As a result, the number of respondents varied for each question because not all training providers responded.

Appendix IV: Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Implementation Challenges

Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Implementation Challenges as Reported by Training Providers, June 2016

Based on GAO’s interviews with officials from Coast Guard, Maritime Administration, and other selected maritime training providers and stakeholders (including unions and associations), we identified the 14 most frequently cited possible challenges that providers may face when implementing the revised STCW requirements. Table 3 presents a summary of the extent to which GAO’s survey respondents reported experiencing challenges in implementing the revised STCW requirements in each of the 14 challenge categories.¹

Table 3: Survey Respondents’ Reported Challenges Due to Implementing the Revised Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Requirements, June 2016

Potential challenge due to implementing the revised STCW requirements	Is this a challenge?					
	Yes		No		Totals	
	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent
1. Interpreting the revised STCW requirements	59	54	50	46	109	100
2. Recruiting qualified instructors to teach courses regarding the revised STCW requirements	49	46	57	54	106	100
3. Developing your organization’s Quality Standards System	48	46	56	54	104	100
4. Developing curriculum for courses your organization teaches regarding the revised STCW requirements	47	44	59	56	106	100
5. The willingness of current STCW-certified merchant mariners to remain employed as STCW-certified merchant mariners	40	41	57	59	97	100
6. Obtaining Coast Guard’s approval for your organization’s training courses and programs regarding the revised STCW requirements	45	40	68	60	113	100

¹We conducted a survey—from March 21, 2016 through June 10, 2016—of the universe of 167 Coast Guard-approved maritime training providers to determine the maritime training providers’ perspectives on Coast Guard’s guidance, their progress implementing the revised STCW requirements, and any costs and benefits of the new requirements. The survey response rate was 81 percent, with 136 respondents answering the survey. Of the 136 who responded, 10 indicated that they did not teach any STCW-related courses; as a result, these providers were excluded from our analysis leaving 126 respondents for consideration.

**Appendix IV: Standards of Training,
Certification and Watchkeeping for Seafarers
(STCW) Implementation Challenges**

Potential challenge due to implementing the revised STCW requirements	Is this a challenge?					
	Yes		No		Totals	
	Number of Respondents	Percent	Number of Respondents	Percent	Number of Respondents	Percent
7. Understanding the documentation required to demonstrate compliance with the revised STCW requirements	43	40	65	60	108	100
8. Ensuring that your current instructors obtain additional training required for compliance with the revised STCW requirements	41	39	65	61	106	100
9. Recruiting potential mariners to enroll in your organization's training programs to seek future licensing and employment as an STCW-certified merchant mariner	37	35	68	65	105	100
10. Additional resources expended by your organization due to potential duplication between the revised STCW and national requirements	34	33	68	67	102	100
11. Preparing for Coast Guard audits of your organization's training courses or programs regarding the revised STCW requirements	31	29	77	71	108	100
12. Additional resources expended by your students due to potential duplication between the revised STCW and national requirements	29	29	72	71	101	100
13. Retaining qualified instructors to teach courses regarding the revised STCW requirements	26	25	78	75	104	100
14. Retaining students currently enrolled in your organization's training programs	8	8	89	92	97	100

Source: GAO | GAO-17-40

Appendix V: GAO Contact and Staff Acknowledgments

GAO Contact

Jennifer Grover, (202) 512-7141 or groverj@gao.gov

Staff Acknowledgments

In addition to the contact above, Ellen Wolfe (Assistant Director); Frederick Lyles, Jr. (Analyst-in-Charge); David Bieler; Chuck Bausell; Eric Hauswirth; Susan Hsu; Monica Kelly; Tracey King; Dainia Lawes; Carl Ramirez; Cynthia Saunders; and Christine San all made key contributions to this report.

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