



January 2022

COAST GUARD

Enhancements Needed to Strengthen Marine Inspection Workforce Planning Efforts

Accessible Version

GAO Highlights

Highlights of [GAO-22-104465](#), a report to congressional committees

Why GAO Did This Study

The Coast Guard serves as the principal federal agency responsible for marine safety. A key element of this mission is the marine inspection program, which employs marine inspectors to conduct vessel inspections. However, for decades, the program has faced challenges maintaining an adequate staff of experienced marine safety personnel.

The National Defense Authorization Act for Fiscal Year 2021 includes a provision for GAO to review marine inspection workforce issues. This report examines the extent to which the Coast Guard has (1) assessed its marine inspection workforce needs and (2) addressed these needs.

To address these objectives, GAO reviewed Coast Guard policies, workforce assessments, and performance plans; analyzed staffing level data from 2012 through 2020 (the years with comparable data); and interviewed Coast Guard officials.

What GAO Recommends

GAO is making five recommendations to strengthen the Coast Guard's workforce planning efforts, including to collect additional data to forecast future industry and workforce trends and to establish performance measures with targets and to use them to assess outcomes. The Department of Homeland Security concurred with these recommendations.

View [GAO-22-104465](#). For more information, contact Heather MacLeod at (202) 512-8777 or macleodh@gao.gov.

January 2022

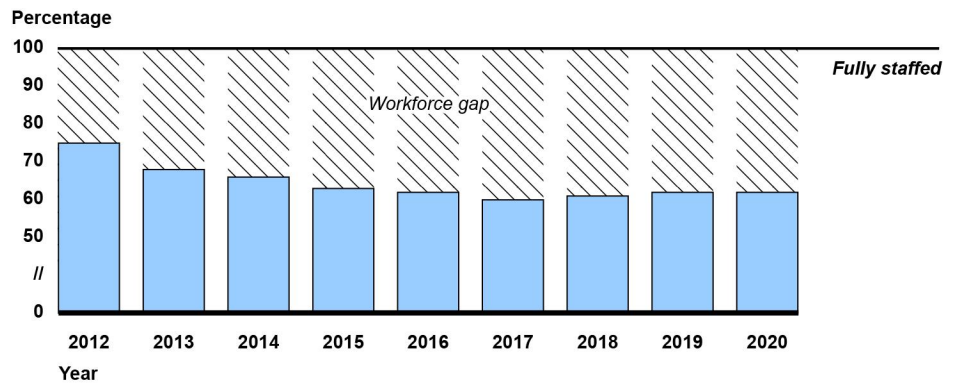
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Enhancements Needed to Strengthen Marine Inspection Workforce Planning Efforts

What GAO Found

The safe operation of vessels is critical to the maritime sector, which contributes nearly \$5.4 trillion annually to the U.S. economy. The U.S. Coast Guard uses a tool called the Sector Staffing Model to assess its marine inspection staffing levels at operational field units for the upcoming year. GAO's analysis of the tool's data shows that the supply of marine inspectors has consistently not met the estimated need (see fig.). However, the Coast Guard collects and analyzes limited data to forecast future workforce and industry trends that could affect the supply and demand for marine inspectors. For example, the Coast Guard collects industry data to forecast workforce needs for certain vessel types (e.g., cruise ships) but not others (e.g., freight vessels). Further, the Coast Guard does not regularly collect and analyze other data, such as future potential retirements, that could affect the supply of marine inspectors. Collecting additional data to forecast future trends in the maritime industry and its marine inspection workforce would enhance the Coast Guard's ability to identify potential future workforce needs.

Percentage of Coast Guard Marine Inspection Workforce Staffed Compared with the Sector Staffing Model's Full Capacity Estimates, 2012 through 2020



Source: GAO analysis of U.S. Coast Guard Sector Staffing Model data. | GAO-22-104465

Accessible Data for Percentage of Coast Guard Marine Inspection Workforce Staffed Compared with the Sector Staffing Model's Full Capacity Estimates, 2012 through 2020

Year	Percentage staffed
2012	75%
2013	68%
2014	66%
2015	63%
2016	62%
2017	60%
2018	61%
2019	62%
2020	62%

The Coast Guard has initiatives as part of its workforce improvement plan to address long-standing marine inspection workforce needs, but they are at varying stages of completion. For example, the Coast Guard began implementing initiatives to address challenges in four key areas—training and skills, technology, workforce staffing levels, and workforce structure. Specifically, in 2020 and 2021, the Coast Guard developed new training courses, deployed a mobile application that allows remote access to its inspection database, and added 65 new marine inspector positions to help address its shortfall of over 400 inspectors. Other initiatives remain ongoing. However, the Coast Guard has not established performance measures with targets for its marine inspection workforce improvement plan and associated initiatives that would identify desired outcomes and provide a means to measure how its efforts help close workforce gaps over time. Doing so would better position the Coast Guard to determine the effectiveness of its efforts to address its marine inspection workforce challenges.

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Abbreviations

DHS	Department of Homeland Security
MISLE	Marine Information for Safety and Law Enforcement
NDAA	National Defense Authorization Act

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January 12, 2022

The Honorable Maria Cantwell
Chair
The Honorable Roger F. Wicker
Ranking Member
Committee on Commerce, Science, and Transportation
United States Senate
The Honorable Peter A. DeFazio
Chairman
The Honorable Sam Graves
Ranking Member
Committee on Transportation and Infrastructure
House of Representatives

The safety of vessels operating within the maritime system is critical, as the U.S. maritime transportation sector contributes nearly \$5.4 trillion annually to the U.S. economy. The U.S. Coast Guard, a multimission maritime service within the Department of Homeland Security (DHS), serves as the principal federal agency responsible for marine safety. The Coast Guard’s marine safety mission is responsible for, among other things, the safe operation of U.S.-registered (flag) vessels around the world and foreign-flag vessels operating in U.S. waters. A key element of this mission is the marine inspection program, which uses marine inspectors to conduct vessel inspections and examinations (exams).¹ According to the Coast Guard, the demand for Coast Guard marine inspection activities has grown significantly over the last several decades and will most likely continue to do so in the foreseeable future.²

The National Defense Authorization Act for Fiscal Year 2021 (NDAA) includes a provision for us to examine and report on issues related to the Coast Guard’s marine inspection workforce.³ Our report addresses the

¹Coast Guard marine inspectors generally conduct inspections on U.S.-flag vessels and examinations on foreign-flag vessels, which are registered in jurisdictions other than the United States. The depth and scope of inspections and examinations differ. Unless otherwise stated, this report uses the term “inspection” to refer to both inspections and examinations that marine inspectors conduct.

²U.S. Coast Guard, *Mission Analysis: Examination of Commercial Compliance Activities within the Marine Safety Mission* (Washington, D.C.: March 2017).

³Pub. L. No. 116-283, § 8257, 134 Stat. 3388, 4677.

extent to which the Coast Guard has (1) assessed its marine inspection workforce needs and (2) addressed its marine inspection workforce needs.

To address both objectives, we reviewed Coast Guard policy manuals as well as performance plans since fiscal year 2006, when the Coast Guard implemented major organizational changes to modernize the service. In addition, we reviewed Marine Safety Long Term Strategy reports the Coast Guard provided to Congress from 2012 through 2020 and prior qualitative assessments of the marine inspection program.⁴

We also reviewed data from the Coast Guard's Sector Staffing Model to determine (1) the extent to which the Coast Guard had a sufficient number of marine inspectors and (2) the size and composition of the workforce.⁵ We reviewed data from 2012 through 2020—the years for which we had comparable and complete data. To assess the reliability of the data, we conducted manual data testing for missing data, outliers, and obvious errors; reviewed agency documents, such as the Sector Staffing Model user guide and accreditation memorandum; and interviewed agency officials responsible for maintaining the data tool. We determined that the data were sufficiently reliable to describe the marine inspection program's overall staffing levels.⁶

We interviewed Coast Guard headquarters and field officials to understand the workforce planning processes, current workforce plans

⁴For examples of long-term strategy reports to Congress, see U.S. Coast Guard, *Marine Safety Long Term Strategy, Performance Report, and Annual Plan* (Washington, D.C.: Jan. 12, 2012) and *Marine Safety Long Term Strategy, Fiscal Year 2019 Performance Report, and Fiscal Year 2020-2023 Triennial Plan* (Washington, D.C.: December 2020). For prior assessments, see Vice Admiral James C. Card (retired), *Coast Guard Marine Safety Analysis: An Independent Assessment and Suggestions for Improvement* (Nov. 16, 2007); Homeland Security Institute, *Independent Evaluation of United States Coast Guard Prevention Programs: Marine Safety & Environment Protection* (Washington, D.C.: Apr. 25, 2009); U.S. Coast Guard, *Marine Inspector Strategic Needs Assessment* (Washington, D.C.: September 2012); and *Mission Analysis: Examination of Commercial Compliance Activities within the Marine Safety Mission* (Washington, D.C.: March 2017).

⁵The Sector Staffing Model is an analytical tool to align the number and type of marine inspectors and other personnel needed at specific sectors and subordinate field units with mission activity requirements.

⁶We aggregated Sector Staffing Model data because the Coast Guard last updated certain Sector Staffing Model assumptions, including the estimated length of time to complete inspections, in 2014, which could affect the results at the unit level, according to Coast Guard officials.

and progress, and to discuss their perspectives on any challenges the Coast Guard faces to address its workforce needs. Specifically, we met with (1) Coast Guard headquarters offices, including the Offices of Shore Forces and Commercial Vessel Compliance; (2) the Atlantic Area and Pacific Area commands; and (3) a nongeneralizable sample of six out of 37 sectors.⁷ Lastly, we interviewed representatives from five maritime industry associations about their experiences working with Coast Guard marine inspectors.⁸ The results from our sector and industry interviews are not generalizable but provide insights on the Coast Guard's marine inspection program. We compared Coast Guard actions to assess and address marine inspection workforce needs against the *DHS Workforce Planning Guide*.⁹

To further address our first objective, we reviewed data from the Shore Forces Competency Framework (Competency Framework) model for August 2020—the most recent data available at the time of our review—to understand the extent to which Coast Guard field units are staffed with personnel with the needed qualifications. To assess the strengths and weaknesses of the Competency Framework, as well as the reliability of the data, we reviewed relevant agency documents such as authorization memorandums and marine inspection assessments mentioned above, and interviewed agency officials responsible for maintaining the Competency Framework. We found that the data are not sufficiently reliable for the purposes of conducting a Competency Framework analysis for reasons discussed in greater detail below.

⁷We interviewed the following sectors and their subunits: Corpus Christi, Delaware Bay, Houston-Galveston, New Orleans, Puget Sound, and St. Petersburg. We selected sectors that had at least 20 marine inspectors and a range of marine inspector staffing levels, are training ports, represent sectors in different parts of the country, and conducted a range of gas carrier exams in fiscal year 2020. About 35 percent of 2020 marine inspections (13,904 of 39,856) occurred in one of these six sectors, according to our analysis of Coast Guard data. We also met with District 5 and District 7 officials as part of the Atlantic Area interview and District 13 officials as part of our Pacific Area interview.

⁸We interviewed the following associations: Passenger Vessel Association, National Association of Charterboat Operators, American Waterways Association, Society of International Gas Tanker and Terminal Operators, and World Shipping Council. We selected these associations to represent a mix of vessel types as well as both domestic and foreign vessels.

⁹Department of Homeland Security, *DHS Workforce Planning Guide* (Washington, D.C.: July 2015).

To further address our second objective, we reviewed Coast Guard strategic plans, memorandums, and various workforce planning documents to understand the plans and activities the Coast Guard employed to address its workforce needs.¹⁰

We conducted this performance audit from August 2020 through January 2022 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

Marine Safety Mission and Inspection Program

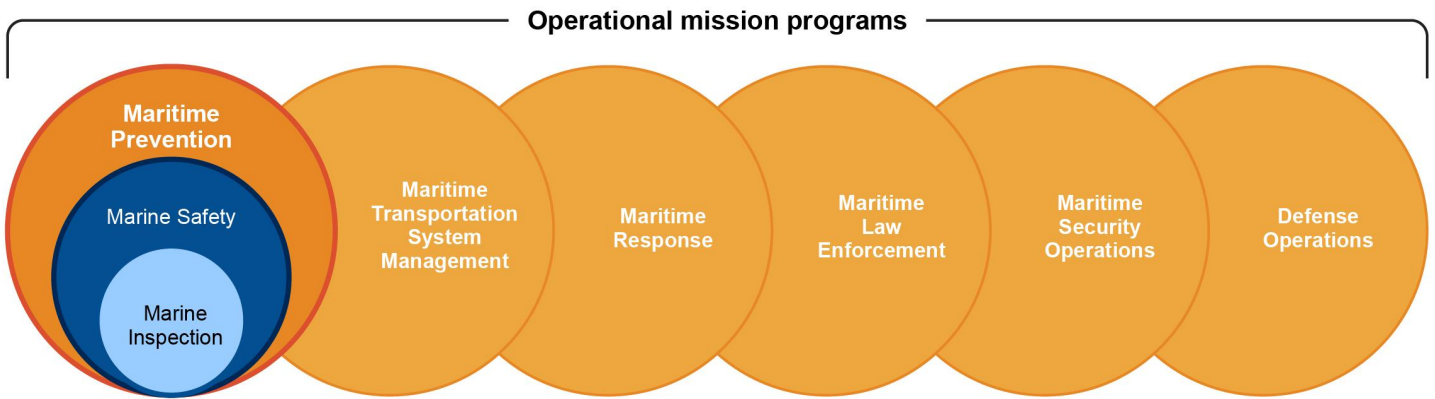
The Coast Guard manages six major operational mission programs that oversee multiple statutory homeland security and non-homeland security activities, as outlined in the Homeland Security Act of 2002, as amended.¹¹ Marine safety falls within the maritime prevention operational mission program (see fig. 1). To carry out the marine safety mission, the Coast Guard is to enforce laws that prevent death, injury, and property loss in the marine environment. A key part of the marine safety mission is the marine inspection program, which works in partnership with industry and ports to ensure compliance with regulations.¹²

¹⁰See, for example, U.S. Coast Guard, *Coast Guard Strategic Plan, 2018-2022* (Washington, D.C.: Nov. 16, 2018). We also reviewed memorandums such as a charter to establish a working group that aims to make recommendations and develop tools to manage the marine inspection workforce. Other workforce planning documents include the U.S. Coast Guard, *Prevention Program Readiness Initiative Report FY2021-2026* (Washington, D.C.: Dec. 16, 2020).

¹¹U.S.C. § 468(a). The Homeland Security Act of 2002 delineates homeland security missions as Ports, Waterways, and Coastal Security; Drug Interdiction; Migrant Interdiction; Defense Readiness; and Other Law Enforcement. It also delineates the following as non-homeland security missions: Marine Safety; Search and Rescue; Aids to Navigation; Living Marine Resources; Marine Environmental Protection; and Ice Operations.

¹²In addition to the marine inspection program, other marine safety programs include inspections of waterfront and offshore facilities and maritime accident investigations.

Figure 1: Placement of the Marine Inspection Program within the Coast Guard’s Operational Mission Structure



Source: GAO analysis of U.S. Coast Guard information. | GAO-22-104465

The Coast Guard verifies compliance through inspections of regulated vessels. Coast Guard marine inspectors regularly inspect U.S.-flag vessels to ensure that they meet all construction standards and are maintained and repaired properly. In addition, they board U.S.-flag vessels as well as foreign-flag vessels entering U.S. ports to determine whether the vessels meet safety, security, and environmental requirements.

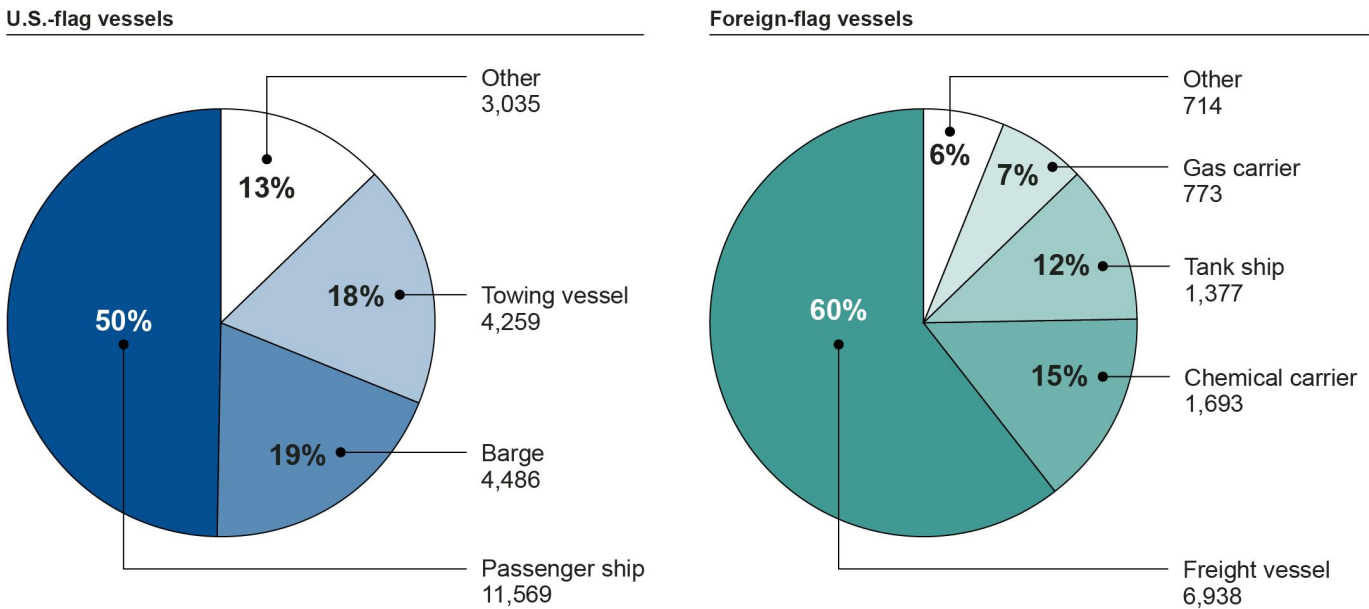
To execute its marine inspection program the Coast Guard employs a multilevel organizational structure. Coast Guard headquarters is responsible for developing national strategies and policies for operations, while field units implement these policies. The Coast Guard organizes its field structure under two area commands (Atlantic and Pacific). The two area commands oversee nine districts across the United States, which are further broken down across 37 sectors. The more than 700 marine inspectors who conduct the vessel inspections are generally stationed at sectors or their subunits.¹³

The type and quantity of a sector’s fleet of responsibility and associated marine inspections vary by location. Sectors containing inland waterways have a fleet that is predominantly comprised of tugboats and barges, while sectors with ports along the coasts have container ships, cruise ships, chemical or commodity carriers, and other oceangoing vessels as

¹³The headquarters-based Traveling Staff is a specialized group of six senior marine inspectors that serve as a traveling technical resource to assist field units as well as industry with unique or high-risk vessels. Sector subunits include marine safety units and marine safety detachments.

part of their routine inspection requirements. Sectors along the Gulf Coast are heavily involved in ensuring compliance of vessels that transport petroleum, gas, and chemicals. Almost 30 percent of 2020 marine inspections occurred in three gulf sectors—Houston-Galveston, New Orleans, and Mobile, according our analysis of Coast Guard data. Figure 2 shows the overall number and categories of inspections the Coast Guard conducted in 2020, according to Coast Guard data on marine inspection.

Figure 2: Coast Guard Inspections in 2020 of U.S.-Flag Vessels and Examinations of Foreign-Flag Vessels by Category



Source: GAO analysis of U.S. Coast Guard data. | GAO-22-104465

Note: Other types of U.S.-flag vessels inspections include offshore vessels, dry cargo ships, and tankships, among others. Other types of foreign-flag vessel examinations include passenger vessels and offshore vessels, among others.

Accessible Data for Figure 2: Coast Guard Inspections in 2020 of U.S.-Flag Vessels and Examinations of Foreign-Flag Vessels by Category

U.S.-flag vessels	Number	Percentage
Passenger ship	11569	50%
Barge	4486	19%
Towing vessel	4259	18%
Other	3035	13%

Foreign-flag vessels	Number	Percentage
Freight vessel	6938	60%
Chemical carrier	1693	15%
Tank ship	1377	12%
Gas carrier	773	7%
Other	714	6%

Marine Inspector Workforce and Training

The Coast Guard uses both military and civilian workforces to conduct marine inspections.¹ According to our analysis of 2020 Coast Guard data, 80 percent of marine inspectors are military personnel, and 20 percent are civilians.² There are two types of military workforces conducting marine inspections—junior commissioned officers (junior officers) and chief warrant officers (warrant officers), who rotate to new locations every 3 or 4 years (called tours). Junior officers are largely involved in duties that provide direct or indirect leadership to day-to-day activities of Coast Guard forces, including the shore-based forces responsible for marine inspections. Junior officers enter the workforce through a variety of sources, including the Coast Guard Academy. Warrant officers are prior enlisted members of the Coast Guard selected to become specialized members of the officer corps. The Coast Guard also employs civilian marine inspectors, many of whom are retired Coast Guard military personnel and generally remain in one location.³

The military and civilian marine inspection workforces are to undergo the same training, and career advancement is possible for personnel from both workforces. Training generally includes both classroom courses and

¹The Coast Guard also delegates certain marine inspection activities to approved third-party organizations, such as the American Bureau of Shipping, as authorized by federal law. See 46 U.S.C. § 3316.

²According to 2020 Coast Guard data, 581 of 725 marine inspectors are military personnel, and 144 are civilians.

³The number of retired Coast Guard military personnel hired as civilian marine inspectors each year has more than doubled since 2010, according to Coast Guard data. In 2010 the Coast Guard hired 33 retired Coast Guard personnel. The number of retirees hired was larger in each subsequent year and on average the Coast Guard hired 70 retired military personnel as civilian inspectors per year, from 2014 through 2020. The Coast Guard also hires and trains civilians who are inexperienced in inspections to become marine inspectors through its 3-year civilian marine inspector apprenticeship program.

a multiyear apprenticeship at a larger port (called a “feeder port”). The Coast Guard trains and certifies marine inspectors on specific competencies to be able to conduct multiple types of vessel inspections. For example, marine inspectors may complete more specialized training and earn the competency to conduct examinations of foreign gas carriers. Military officers and civilians who complete their apprenticeship and earn multiple inspection competencies become a Journeyman and eventually an Advanced Journeyman, which the Coast Guard regards as technical experts for marine inspections.⁴

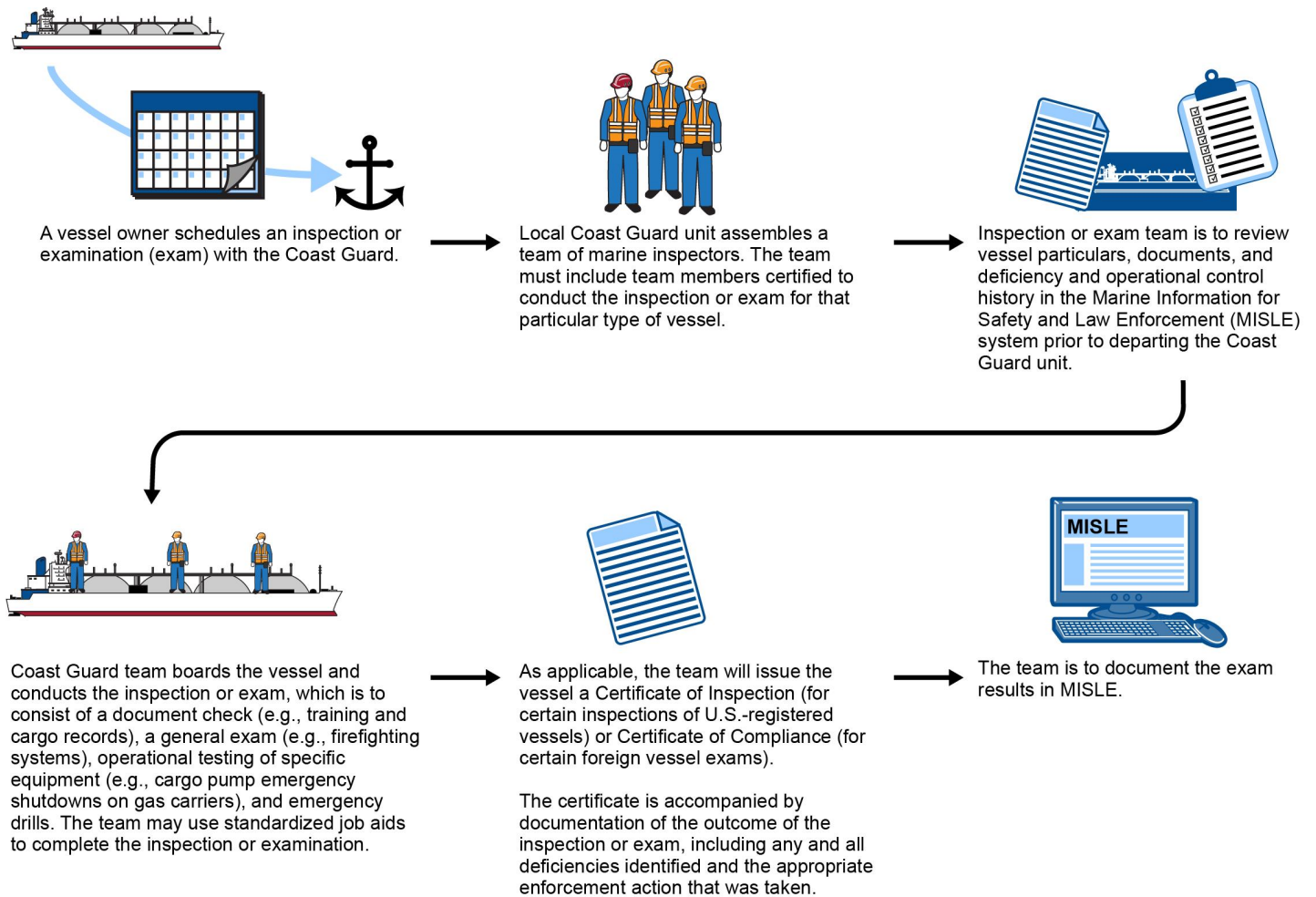
Coast Guard Marine Inspection Process

The Coast Guard’s vessel inspection process involves assembling a team of marine inspectors that may include military personnel, civilians, and trainees (i.e., apprentices) who (1) review documentation about the vessel, including its history and the results of previous Coast Guard inspections, prior to the vessel’s arrival; (2) board the vessel to review additional documentation and observe and test such things as ship systems and crew knowledge (e.g., using fire-fighting equipment) to identify any deficiencies; and (3) document the results of the exam in the Marine Information for Safety and Law Enforcement (MISLE) system.⁵ Figure 3 provides more detail on this process.

⁴Journeyman have a minimum of 3 years’ experience conducting marine inspections as an apprentice and have attained at least four competencies. Advanced Journeyman have a minimum of 3 years’ experience as a Journeyman and have attained at least five of the more than 20 competencies. Journeyman and Advanced Journeyman are the Coast Guard’s official terms for these positions. Both women and men may hold these positions.

⁵See 46 C.F.R. § 153.809.

Figure 3: Key Steps in the Coast Guard's Vessel Inspection and Examination Process



Source: GAO analysis of U.S. Coast Guard information. | GAO-22-104465

Note: The Coast Guard generally conducts inspections of U.S.-registered (flag) vessels and examinations of foreign-flag vessels.

The amount of time needed to complete an inspection varies by vessel type and condition, among other factors. For example, marine inspectors may be able to complete an inspection of a small passenger vessel in an hour, but certain U.S.-flag ocean-going vessels could take 2 or 3 days, according to Coast Guard officials.

Long-Standing Coast Guard Marine Inspection Workforce Challenges

Over the past 4 decades, we and others have reported on the Coast Guard's challenges to maintain an adequate staff of experienced marine safety personnel to ensure that vessels meet federal safety standards.⁶ Specifically, in four reports we issued from 1979 to 2010, we found that the Coast Guard faced difficulties in maintaining a sufficient number of experienced and trained staff in the vessel inspection area. We also reported that there were concerns with the experience or skill level of some marine inspectors.

- In 1979, we called attention to the Coast Guard's practice of rotating its staff among various duty stations every 3 years, which limited its ability to develop and keep experienced and trained staff with vessel inspection expertise.⁷
- We reported similar findings specific to tank vessels inspections in 1991, including that the Coast Guard had too few and too inexperienced marine inspectors to meet inspection demands.⁸
- In 1996, we reported that about two-thirds of the marine safety positions were filled with personnel whose qualifications were lower than the level authorized for that position.⁹
- In 2010, we found that the impact of expanding Coast Guard missions and the increasing nationwide need for mission-ready Coast Guard units underscored shortcomings in the Coast Guard's ability to effectively allocate resources (such as personnel), ensure readiness

⁶GAO, *How Effective Is The Coast Guard in Carrying Out Its Commercial Vessel Safety Responsibilities?* [GAO/CED-79-54](#) (Washington, D.C.: May 25, 1979); *Management Improvement Could Enhance Enforcement of Coast Guard Marine Safety Programs*, [GAO/RCED-85-59](#) (Washington, D.C.: Aug. 15, 1985); *Coast Guard: Inspection Program Improvements Are Under Way to Help Detect Unsafe Tankers* ([GAO/RCED-92-23](#), Oct. 8, 1991); *Coast Guard's Marine Safety Program Staffing*, [GAO/RCED-96-162R](#) (Washington, D.C.: June 11, 1996); *Coast Guard: Service Has Taken Steps to Address Historic Personnel Problems, but It Is too Soon to Assess the Impact of These Efforts*, [GAO-10-268R](#) (Washington, D.C.: Jan. 2010). Congressional Research Service, *The Coast Guard's Need for Experienced Marine Safety Personnel*, R45923 (Washington, D.C.: Sept. 2019).

⁷[GAO/CED-79-54](#).

⁸[GAO/RCED-92-23](#).

⁹[GAO/RCED-96-162R](#).

levels, and maintain mission competency.¹⁰ In that report, we highlighted several initiatives that were underway to help address these issues, including development of a workforce plan, but noted it was too soon to tell if the initiatives would be effective.¹¹

The Coast Guard has also analyzed its marine inspection workforce challenges and consistently identified the marine inspection workforce as important to carrying out its goals. For example, from 2007 through 2017, multiple assessments of the marine inspection workforce conducted by and for the Coast Guard found gaps in inspection proficiency and knowledge, personnel system issues, training inconsistencies or access to training challenges, and overall capacity (staffing levels).¹²

Coast Guard Assesses Staffing Levels and Skills, but Its Tools Have Limitations

Tool Aligns Staffing Levels with Mission Requirements, but Limited Data Collected to Forecast Marine Inspection Workforce Needs

The Coast Guard developed a tool to estimate the number and type of field personnel needed at specific sectors and subordinate field units but collects limited data to forecast future workforce and industry trends that

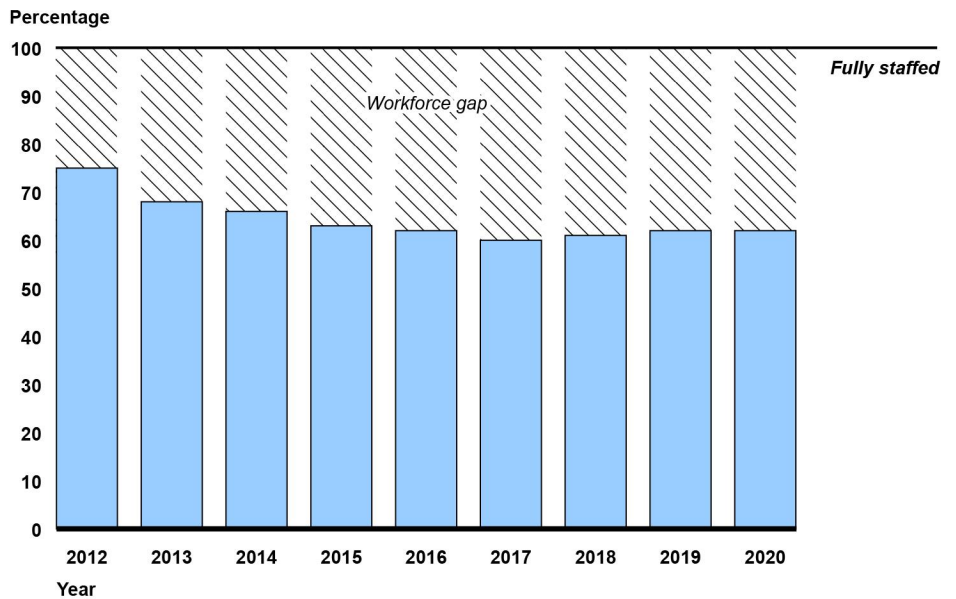
¹⁰[GAO-10-268R](#).

¹¹We reported that the creation of a workforce plan can help to ensure that the Coast Guard better aligns its human capital program with current and emerging mission requirements and facilitates the development of long-term strategies for acquiring, training, and retaining needed staff.

¹²See Card (retired), *Coast Guard Marine Safety Analysis*; Homeland Security Institute, *Independent Evaluation of United States Coast Guard Prevention Programs*; U.S. Coast Guard, *Marine Inspector Strategic Needs Assessment*; and *Mission Analysis: Examination of Commercial Compliance Activities*.

could affect the supply and demand for marine inspectors.¹³ Since 2012, the Coast Guard has used the Sector Staffing Model to align the number and type of marine inspectors and other personnel needed with mission activity requirements. The tool uses a 3-year average of historical data on the number and type of inspections conducted to identify the number of marine inspectors needed for the upcoming year. Data from 2012 through 2020 show that the overall supply of marine inspectors has consistently not met the estimated need, according to our analysis (see fig. 4).

Figure 4: Percentage of Coast Guard Marine Inspection Workforce Staffed at Sectors Compared with the Sector Staffing Model’s Full Capacity Estimates 2012 through 2020



Source: GAO analysis of U.S. Coast Guard Sector Staffing Model data. | GAO-22-104465

Note: According to the Sector Staffing Model results, “fully staffed” means that there are a sufficient number of marine inspectors to complete the estimated number of inspections. The total number of marine inspectors needed to attain full staffing may change from year to year, such as 917 in 2012 and 1,168 in 2020. This figure does not include data on marine inspectors assigned to marine safety detachments, which are sector subunits.

¹³As we reported in February 2020, the Coast Guard’s preferred method for assessing workforce needs is the manpower requirements determination—a structured analysis to determine the number and types of personnel needed to effectively perform each mission to a specified standard. See GAO, *Coast Guard: Actions Needed to Evaluate the Effectiveness of Organizational Changes and Determine Workforce Needs*, [GAO-20-223](#) (Washington, D.C.: Feb. 26, 2020). However, Coast Guard officials noted that they have not prioritized conducting a Marine Safety manpower requirements determination because they use the Sector Staffing Model to determine workforce needs.

Accessible Data for Figure 4: Percentage of Coast Guard Marine Inspection Workforce Staffed at Sectors Compared with the Sector Staffing Model's Full Capacity Estimates 2012 through 2020

Year	Percentage staffed
2012	75%
2013	68%
2014	66%
2015	63%
2016	62%
2017	60%
2018	61%
2019	62%
2020	62%

Coast Guard planning documents, as well as headquarters and field officials we interviewed at six sectors stated that the Coast Guard generally does not have a sufficient number of experienced marine inspectors. According to Coast Guard officials, requests for marine inspection positions compete with the Coast Guard's other mission needs and are not always included in the Coast Guard's final budget request.

While the Sector Staffing Model provides an estimate of the number of marine inspectors the Coast Guard needs for the upcoming year, it is not a forecasting tool. The Coast Guard collects and analyzes limited data to forecast future workforce and industry trends that could affect the supply and demand for marine inspectors.

- **Future staffing supply.** Coast Guard officials stated that they completed an informal assessment to determine the typical length of service that warrant officers serve as marine inspectors before retiring to understand how to mitigate future workforce gaps for this group. However, that analysis did not consider the potential effect of a new retirement system that allows military personnel to retire earlier.¹⁴ Additionally, Coast Guard officials stated that because civilians retire in fewer numbers, and junior officers generally transition to other

¹⁴As of January 2018, the military changed its retirement system to the Blended Retirement System, which provides military personnel, including Coast Guard personnel, the flexibility to receive certain benefits if they retire prior to 20 years of service. See Pub. L. No. 114-92, § 631, 129 Stat. 726, 842. Under the previous retirement system, military personnel only received benefits if they served for at least 20 years.

positions and do not retire as marine inspectors, they did not conduct similar analyses for these workforces.

- **Future staffing demand.** In certain instances, the Coast Guard may complete forecasting for specific types of vessels to determine potential risks and future staffing needs. For example, Coast Guard subject matter experts on gas carriers and cruise ships stated that they use industry information to forecast workforce needs for marine inspectors with relevant competencies. However, the Coast Guard does not collect other types of industry data (e.g., barge or freight vessel trends) to assess the overall effect of changes in the industry or to forecast demand for marine inspectors with all types of competencies. According to the 2017 mission analysis of marine safety and Coast Guard officials, the Sector Staffing Model's use of historical inspection data to determine the industry demand for the marine inspection workforce is one of the model's key limitations.¹⁵ Additionally, field officials we spoke with described certain industry trends that could potentially worsen the staffing shortages as the demand for inspectors rises with the increased construction of new vessels, additional refinery and gas liquefaction facilities, and additional ports to facilitate increases in exports and imports.¹⁶

The DHS Workforce Planning Guide underscores the importance of examining both the current and future workforce needs that are critical to achieving the mission and goals.¹⁷ According to the guide, this should include an analysis of data to forecast how key trends could affect future staffing supply and demand, such as retirement rates and industry trends that may affect mission needs. Furthermore, the December 2020 *Prevention Program Readiness Initiative Report FY2021-2026* stated that workforce modeling needs to be forward leaning.¹⁸

Coast Guard officials identified several reasons why they forecast marine inspection workforce supply and demand on a limited basis. Coast Guard officials stated that assessing the effect of the new military retirement

¹⁵U.S. Coast Guard, *Mission Analysis: Examination of Commercial Compliance Activities*.

¹⁶According to Coast Guard officials, they have processes in place to cover inspections in a sector until additional resources can be provided, including surge support from other units.

¹⁷The *DHS Workforce Planning Guide* also discusses the need to link workforce planning to strategic programmatic goals to ensure they align, which the Coast Guard has consistently done in its workforce planning documents issued from 2007 through 2020. Other parts of the *DHS Workforce Planning Guide* are discussed later in this report.

¹⁸U.S. Coast Guard, *Prevention Program Readiness Initiative Report FY2021-2026*.

system would be difficult because retirement is based on personal decisions made by individual marine inspectors. However, the Coast Guard could collect information through, for example, internal employee surveys on marine inspector retirement plans or data on retirement eligibility to better anticipate potential staffing gaps. In addition, according to Coast Guard officials, their primary assessment tool, the Sector Staffing Model, is not designed to be a long-term forecasting tool. Further, Coast Guard officials and industry representatives told us that the Coast Guard could collect and analyze additional existing industry data outside of the Sector Staffing Model to conduct marine inspection workforce forecasting. Other potential sources of information include input from Coast Guard field units, trade publications, other government agencies (e.g., the Energy Information Agency), and certain companies that engage in maritime trade.

Since personnel are the primary resource used to complete marine inspections, collecting additional information on retirement plans or other data that could affect the supply of marine inspectors could help the Coast Guard better determine its future workforce needs. Further, collecting additional data and forecasting future trends in the maritime industry and demands they might place on the marine inspection workforce would enhance the Coast Guard's ability to identify potential future workforce needs and develop plans to address them.

Coast Guard Tool to Assess Marine Inspection Competency Levels Lacks Quality Data

The Coast Guard developed the Competency Framework—a quantitative tool that it first used in 2020 on a limited basis—to assess whether certain marine inspector and other marine safety positions are staffed with personnel who have the needed skills (competencies), but both the tool and the data used for the analysis have limitations.¹⁹ The Competency Framework uses information from, among other sources, the Coast Guard's human resource database which records the competencies individuals attain. According to Coast Guard officials, the results of the

¹⁹The Coast Guard developed the Competency Framework by first reviewing and standardizing the competencies for approximately 8,000 positions across all sectors and their subunits and determined which competencies were critical for each position. Next, the Coast Guard developed a method to retrieve competency and personnel information from multiple databases to measure the percent of marine inspectors and other sector personnel who have all of the required competencies for a specific position, as determined by its standardization process.

Competency Framework help them to (1) make strategic staffing decisions to ensure that they assign the right personnel to the right positions and (2) assess the risks associated with filling a position with unqualified personnel. According to Coast Guard officials, they plan to use the Competency Framework twice a year to conduct competency assessments of the marine inspection workforce. Coast Guard headquarters and field officials agree with initial Competency Framework results from August 2020 that, in general, show that marine inspector positions are sometimes filled with unqualified personnel.²⁰ According to Coast Guard officials in the field, having fewer qualified marine inspectors results in a loss of subject matter expertise at the sectors and not enough experienced marine inspectors available to train apprentices.

The Coast Guard's analysis using the Competency Framework is limited by incomplete data, which affects the Coast Guard's ability to assign staff to the right positions or locations where their skills would better align with the unit's needs. For example, officials in one sector we spoke with told us that their marine inspectors generally had the required competencies, but we found the August 2020 Competency Framework output for that same sector showed that about half of their marine inspectors did not have all of the competencies required for their positions. Reasons for these discrepancies could be twofold.

- The Competency Framework currently only reflects whether a person has fully achieved a particular competency (indicating 100 percent attainment in the system). For personnel who are in progress toward, but have not yet completed the curriculum for a competency—including apprentices—the system shows 0 percent attainment rather than a more accurate and specific percentage of the inspectors' progress.
- Coast Guard officials reported that the Competency Framework analysis relies on marine inspectors to voluntarily input the competencies they earn into the human resource database in a timely manner.²¹ However, Coast Guard officials also told us that military marine inspectors have little incentive to keep their competency information up to date until they are applying for promotion or are approaching a rotation. Likewise, civilian marine inspectors generally

²⁰Coast Guard officials in all six sectors told us that units are sometimes staffed with marine inspectors without the required competencies.

²¹Competencies include specific training, a certain level of marine inspector, and certification to conduct inspections on certain vessel types.

do not keep their qualification data current because there is little incentive to do so, as they generally do not transfer to locations where having updated information would be more essential to making staffing decisions, according to Coast Guard officials.

As a result, the Competency Framework analysis, which relies on the information entered into the human resources database, likely yields inaccurate results due to underreported competencies.

According to the *DHS Workforce Planning Guide*, understanding skill gaps is important to identify critical weaknesses in the current or future workforce, which could compromise mission readiness. Additionally, the *DHS Information Quality Guidelines* states that components should focus on ensuring accurate, reliable, and unbiased information to maximize the quality of their data.²² According to Coast Guard officials, they have ongoing efforts to improve the Competency Framework, including improving its data input to reflect an individual's progress toward attaining a competency. However, there is no requirement for marine inspectors to input newly earned competency information, according to our review of the *Competency Management System Manual* and interviews with Coast Guard officials. Instead, Coast Guard officials stated that they have initiated an effort to emphasize the importance of keeping competency information up to date through presentations to Coast Guard leadership and field staff. Under this approach, inputting competency information remains voluntary, and marine inspectors have competing priorities for their time.

By requiring marine inspectors to update their competency information in the human resources database—information the Coast Guard has identified as essential for making annual staffing decisions—and specifying when to make such updates, the Coast Guard could better assess the marine inspection workforce competencies at sectors. In turn, this could help the Coast Guard make more informed decisions to address competency gaps and better align personnel with sector needs when making staffing decisions.

²²Department of Homeland Security, *Information Quality Guidelines* (Washington, D.C.: May 2019).

Initiatives to Address Long-Standing Workforce Needs Underway but Lack Performance Measures

Initiatives Underway Address Training, Technology, and Personnel Needs, but Some Are Behind Schedule and Lack Updated Time Frames

The Coast Guard implemented initiatives as part of its workforce improvement plans to address marine inspection workforce needs in four key areas—training and skills, technology, workforce staffing levels, and workforce structure. However, the Coast Guard has not always kept time frames and milestones up to date—a key monitoring activity—and certain long-standing initiatives remain incomplete.²³

Training and Skills

The Coast Guard has implemented certain training and skills development initiatives identified in various marine inspection workforce plans, and a key initiative identified in 2012 to optimize marine inspector training is nearing completion. For example, the Coast Guard completed its 2007 plans to establish national centers of expertise for certain vessel types, including cruise ships, towing vessels, and gas carriers. Further, in 2018, the Coast Guard completed plans to establish the Enlisted Marine Inspector Training Program that trains senior enlisted personnel to become warrant officers sooner in their careers. This allows the Coast Guard to retain its more experienced marine inspectors for additional years before they retire.

The Coast Guard also developed a key training initiative that is nearing completion. Specifically, the 2012 *Marine Inspector Strategic Needs Assessment* recommended the development of a marine inspector performance support architecture—to serve as a roadmap for marine inspectors to cultivate optimal skills and proficiency. In response, the Coast Guard initiated performance support efforts in May 2019, which

²³Workforce plans the Coast Guard developed include the *Marine Safety Performance Plan Fiscal Year 2009–2014* (Washington D.C.: November 2008); *Maritime Prevention Program Performance Plan Fiscal Year 2014–2019* (Washington D.C.: August 2013); and *Deputy Commandant for Operations Program Plans Compilation: Maritime Prevention* (Washington, D.C.: November 2019).

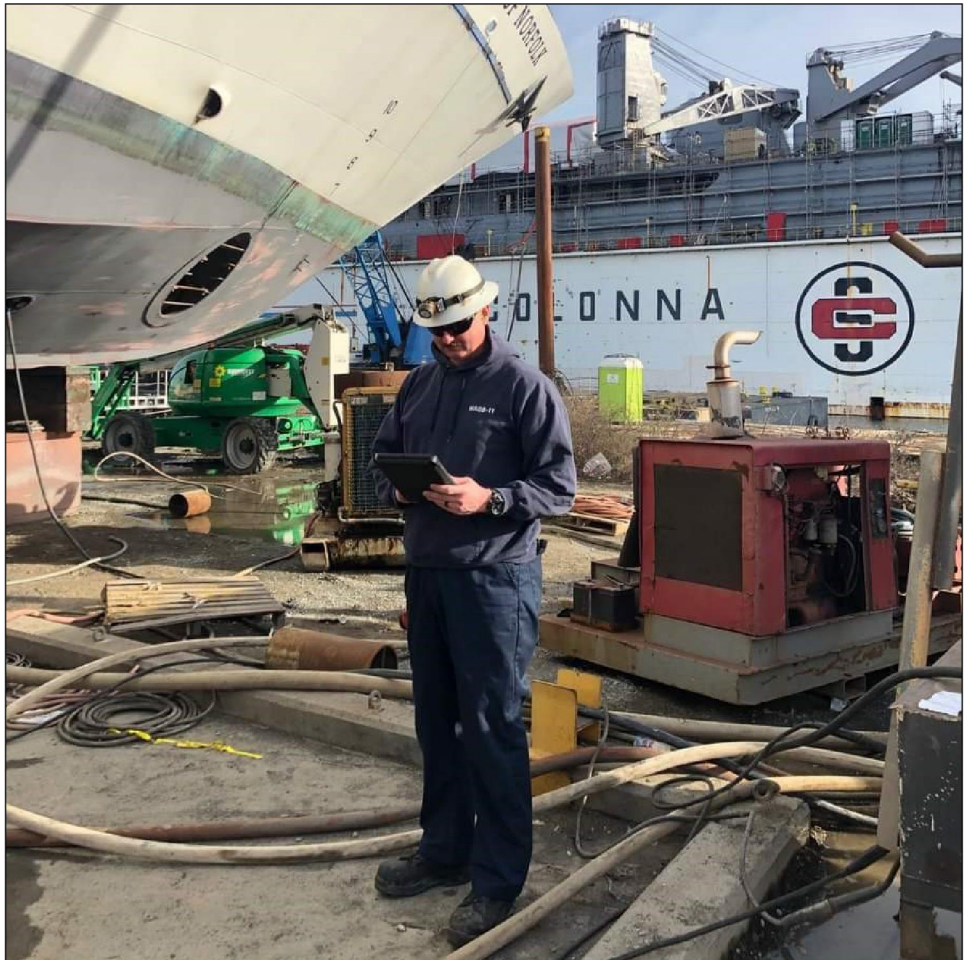
included assessing over 3,000 work task descriptions to develop training and leadership courses for all levels of marine inspectors. As of December 2021, the Coast Guard had completed field-testing for 28 new courses and planned to launch them in winter-spring 2021-2022, according to Coast Guard officials. Coast Guard officials stated that they planned to focus next on completing Journeyman continuing education courses, among others. The Coast Guard considers this a high priority initiative.

Technology

The Coast Guard identified priorities to improve technology for marine inspectors in multiple workforce plans and recently completed initiatives related to portable technology, but challenges remain.²⁴ In June 2019, the Coast Guard completed its initiative to provide marine inspectors with mobile tablets containing reference material, such as inspection regulations and job aids. Additionally, in August 2021, the Coast Guard completed deployment of its INSPECT application initiative that provides marine inspectors with access to the MISLE database in the field on a portable device. According to Coast Guard officials, by using this application, marine inspectors can complete up to 90 percent of inspection administrative duties away from their office—including inputting inspection results and printing inspection findings (see fig. 5). Coast Guard officials in the field said that it can take up to 2 hours to input inspection results into MISLE for the simplest vessel inspections and that the mobile technology would save them significant time because they can input results in real time away from their office.

²⁴See, for example, U.S. Coast Guard *Marine Safety Performance Plan Fiscal Year 2009–2014* and *Maritime Prevention Program Performance Plan Fiscal Year 2014–2019*.

Figure 5: Coast Guard Marine Inspector Using a Tablet during a Vessel Inspection



Source: U.S. Coast Guard. | GAO-22-104465

These information technology improvements may help address marine inspection workforce needs, but challenges remain.²⁵ For example, ongoing challenges with MISLE—a key system used by marine inspectors—could affect the Coast Guard’s ability to complete ongoing initiatives. In July 2020 we found that there are challenges using MISLE due to duplicate or incomplete records.²⁶ Marine inspectors we interviewed for that review said it can be challenging to search MISLE to

²⁵Improving information technology systems has been a workforce plan initiative since 2008.

²⁶See GAO, *Coast Guard: Actions Needed to Ensure Investments in Key Data System Meet Mission and User Needs*, [GAO-20-562](#) (Washington, D.C.: July 16, 2020).

plan inspection activities because pertinent inspection histories can be located under duplicate or multiple vessel records.

MISLE's limitations have delayed Coast Guard efforts to expand the use of risk-based inspections to improve efficiency in the workload of marine inspectors. In 2019, the Coast Guard developed plans to expand the use of risk-based inspections to focus marine inspections on higher-risk systems and vessels. The Coast Guard has already implemented risk-based inspection programs for certain vessel types, such as foreign and small passenger vessels.²⁷ However, according to Coast Guard officials, MISLE's functionality severely limits their ability to collect robust data to establish comprehensive risk-based inspection programs. For example, MISLE lacks the capability to import the results of inspections conducted by other countries. According to Coast Guard officials, until the issues with MISLE are resolved, they will be unable to make significant progress on this initiative.

In July 2020, we found that the Coast Guard had completed major system changes to MISLE in 2015 but did not follow key systems development processes. As a result, we recommended that the Coast Guard follow its key systems development processes to identify and analyze alternatives to select solutions to meet mission needs. The Coast Guard concurred and said it plans to replace MISLE. As of December 2021, efforts were ongoing.

Workforce Staffing Levels

The Coast Guard has made progress implementing key initiatives to address workforce staffing shortages. For example, the Coast Guard added 65 new marine inspector positions from fiscal years 2020 to 2021 to help increase capacity and address its shortfall of over 400 marine inspectors.²⁸ Another key staffing initiative is to leverage the capabilities

²⁷In January 2022, we reported on issues pertaining to Coast Guard gas carrier compliance exams. We found that the Coast Guard had not assessed the benefits of conducting these exams based on risk and recommended that it do so. See, GAO, *Coast Guard: Assessment of a Risk-Based Approach for Conducting Gas Carrier Exams Is Needed*, [GAO-22-105432](#) (Washington, D.C.: Jan. 12, 2022).

²⁸Despite persistent workforce capacity gaps, marine inspection positions were not requested in the President's budget from Fiscal Years 2013 through 2019. According to Coast Guard officials, requests for marine inspection positions compete with the Coast Guard's other mission needs and do not always make it into the final budget request.

of third-party organizations, such as the American Bureau of Shipping, to manage the Coast Guard’s inspection requirements.²⁹ For example, when the 2016 towing vessel regulations added an estimated 6,000 vessels (a 50 percent increase) to the domestic fleet, towing vessel companies were given the option to use third-party organizations to complete the inspection requirements.³⁰ The Coast Guard is on target to issue all required Certificates of Inspection by 2022.

Workforce Structure

The Coast Guard has another ongoing initiative—referred to as the “workforce pyramid”—to define the optimal size and structure of an effective workforce, which has been a long-standing issue and is behind schedule. The structure of the workforce pyramid is based on the need to maintain certain numbers of military positions at various ranks—where the base of the pyramid is balanced by a greater number of lower-ranking officers who, as they move up in rank, occupy the fewer positions that require more experienced personnel. A 2009 study found that the Coast Guard’s marine inspection workforce pyramid did not have the appropriate number of more senior marine inspectors with the necessary competencies to manage its scarce resources.³¹ Over the past decade, the Coast Guard took steps to change the pyramid by, for example, increasing the number of civilian marine inspectors. However, according to Coast Guard officials, the current workforce pyramid also may not be ideal and could exacerbate staffing level and skills gaps.³² Specifically, according to Coast Guard officials, the current workforce pyramid is not configured to retain the expertise of warrant officers and civilians—the workforces with the most marine inspection experience. Officials said that this expertise is a key advantage of these workforces.³³ Coast Guard officials also stated that much of the marine inspection workforce gap is

²⁹In April 2020, we reported on how the Coast Guard conducts oversight of third-party organizations. See GAO, *Vessel Safety: The Coast Guard Conducts Recurrent Inspections and Has Issued Guidance to Address Emergency Preparedness*, [GAO-20-459](#) (Washington, D.C.: Apr. 8, 2020).

³⁰81 Fed. Reg. 40004 (June 20, 2016).

³¹See Homeland Security Institute, *Independent Evaluation of United States Coast Guard Prevention Programs*.

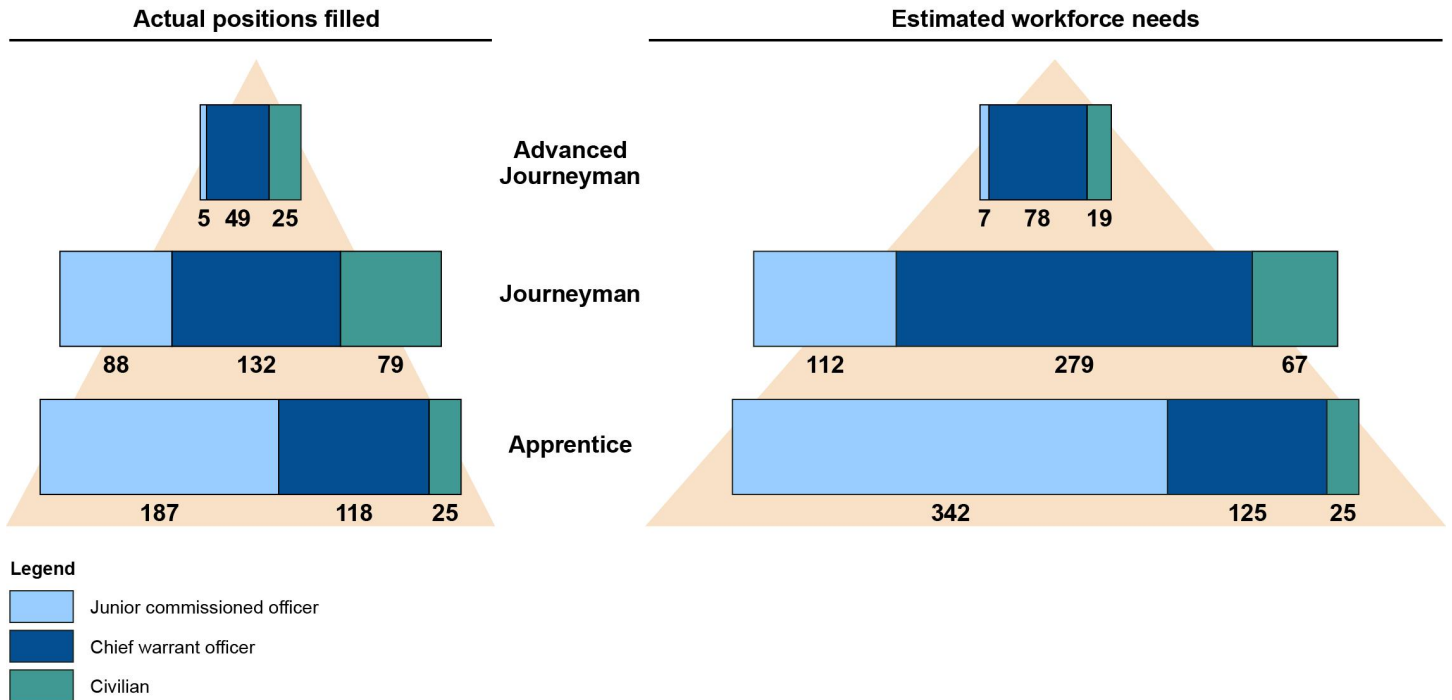
³²The workforce gap of about 400 marine inspectors that we reported above is based on staffing configuration assumptions in the 2020 workforce pyramid.

³³The Coast Guard identified both advantages and disadvantages of the military and civilian workforces, which are further discussed in app. I.

attributed to the fact that they must continually train junior officers who generally do not remain in the marine inspection program but go on to hold leadership roles.

Figure 6 shows that the 2020 pyramid of estimated workforce needs—derived from the Sector Staffing Model—assumes that most apprentices are junior officers, but many are not expected to remain in the field to become more senior marine inspectors. The figure also shows that there are relatively few warrant officer apprentice positions filled to address the warrant officer staffing-level gap at the Journeyman level. Coast Guard headquarters and field officials told us this is a major contributing factor to the workforce skills gap, because the Coast Guard sometimes fills these positions with apprentices.

Figure 6: Comparison of the Actual Size and Composition of the Coast Guard Marine Inspector Workforce with the Estimated Workforce Needs (Workforce Pyramid), for 2020



Source: GAO analysis of U.S. Coast Guard Sector Staffing Model data. | GAO-22-104465

Note: The difference between positions filled and the estimated workforce needs is generally the result of unfunded positions, according to Coast Guard officials. This figure does not include data on marine inspectors assigned to marine safety detachments, which are sector subunits.

Accessible Data for Figure 6: Comparison of the Actual Size and Composition of the Coast Guard Marine Inspector Workforce with the Estimated Workforce Needs (Workforce Pyramid), for 2020

Category	Subcategory	Actual positions filled	Estimated workforce need
Advanced Journeyman	Junior commissioned officer	5	7
Advanced Journeyman	Chief warrant officer	49	78
Advanced Journeyman	Civilian	25	19
Journeyman	Junior commissioned officer	88	112
Journeyman	Chief warrant officer	132	279
Journeyman	Civilian	79	67
Apprentice	Junior commissioned officer	187	342
Apprentice	Chief warrant officer	118	125
Apprentice	Civilian	25	25

As part of the ongoing workforce pyramid initiative, the Coast Guard established the Marine Inspection Workforce Working Group in January 2020 to research and recommend the optimal composition, size, career path, and sustainment of the future marine inspector workforce. Coast Guard officials stated that the working group prioritized actions based, in part, on December 2018 and February 2019 workshops to solicit opinions from marine inspectors in the field to better understand the marine inspection workforce and its challenges. Coast Guard officials stated that the findings from these workshops echoed many of the same workforce structure-related gaps previously identified.

The first phase of activities for the working group included defining the optimal performance requirements for each marine inspection workforce type (e.g., number of years as a trainee and inspector) and their managers, then determining the roles and responsibilities of each workforce (e.g. whether junior officers are more suited to be managers).³⁴ According to the Coast Guard, the next phase of this initiative involves modelling the different workforce options under consideration to identify the optimal size and structure for the marine inspection workforce. Such options include replacing junior officers with warrant officers, standardizing military officer tour lengths, and requiring military officers to complete consecutive tours in a prevention-related mission (e.g.,

³⁴For example, the working group determined that the optimal marine inspector will have completed a minimum of 2 years as a trainee as well as two tours (about 6 to 8 years) as a marine inspector, preferably back-to-back.

investigations).³⁵ The Coast Guard is to use the results of this effort to update the Sector Staffing Model, which officials said could mitigate the staffing level and skills gaps discussed above.

However, the Coast Guard has not updated the time frames and milestones for monitoring the modeling effort, which is already behind schedule. The original date to complete the workforce pyramid and make the associated policy updates was September 2020. According to Coast Guard officials, this effort is delayed because the offices with the necessary expertise to complete the analysis have limited resources and have prioritized other tasks, which include addressing statutory mandates. Further, Coast Guard officials also stated that implementing marine inspection initiatives is challenging because the marine safety mission must compete with 10 other Coast Guard mission areas for resources.³⁶ These officials stated that the working group is considering using a contractor to complete the analysis, but they do not have time frames or milestones for when they might make this determination or complete the initiative. According to working group officials, the delay could extend efforts to complete this initiative by years.

The DHS Workforce Planning Guide directs components to identify plans that are off track or face barriers to successful completion and take steps to remedy the challenges, including updating the time frames, as warranted. The guide further states that implementing the plan is an important step in workforce planning. Coast Guard officials stated that it is difficult to revise the workforce pyramid initiative's milestones and time frames because there is uncertainty regarding whether senior management will approve the option to pursue a contract and, if so, what the parameters of the contract might include. While senior managers have identified the workforce pyramid initiative as a priority and are

³⁵According to Coast Guard officials, they are not considering modeling the effect of extending marine inspection tours. In 2014, the Coast Guard implemented plans to extend warrant officers' tours at certain geographic locations from 3 to 4 years to allow them to hone their marine inspection expertise. This same year, the Coast Guard increased tour lengths from 4 to 5 years for certain enlisted personnel who support marine inspection but reverted back to 4 year tours in 2020 because the Coast Guard found that undesired and unforeseen results outweighed the limited benefits. For example, the longer tours hindered professional development, and assignment to an undesirable location for a 5 year tour negatively affected retention.

³⁶From 2011 through 2021, marine inspectors have comprised about 1.5 percent of the overall Coast Guard workforce.

monitoring its progress, they do not require the working group to update time frames and milestones as part of monitoring efforts.

Identifying and establishing the optimal marine inspection workforce pyramid has been a long-standing challenge for the Coast Guard that has gone unresolved. The workforce pyramid initiative has the potential to significantly reduce marine inspection workforce staffing level and skills gaps and promote a more efficient use of Coast Guard resources. Updating milestones and time frames for this initiative could help the Coast Guard monitor the initiative's progress until it is completed.

Coast Guard Lacks Metrics to Evaluate Workforce Improvement Plan Effectiveness

The Coast Guard has not established performance measures for its marine inspection workforce improvement plan and associated initiatives that would identify desired outcomes and provide a means to measure how its plan would help close marine inspection workforce gaps over time. The Coast Guard's *Marine Safety Long Term Strategy* reports—provided to Congress each year from 2012 through 2016 and in 2020—include goals and associated performance information.³⁷ One goal in the 2020 report is to improve human resource capabilities, which includes enhancing the capacity and competency of marine inspectors. In the report, the Coast Guard committed to (1) establishing a clear workforce structure to identify and close gaps in staffing levels among marine inspectors, (2) modernizing training, and (3) reinforcing career paths. The performance reports also include information on the Coast Guard's progress toward implementing the strategy, such as data on the marine inspection workforce shortage and the number of marine inspectors who completed certain training courses. However, these reports do not include performance measures with targets for gauging the success of the Coast Guard's goal to improve human resource capabilities.

Coast Guard officials also told us they do not have performance measures that pertain to any of the key initiatives in its workforce plan to address marine inspection workforce needs. This is not a new issue, as the Coast Guard also did not develop human resource performance measures for the marine inspection workforce in its 2009 or 2014

³⁷See, for example, U.S. Coast Guard, *Marine Safety Long Term Strategy, FY 2019 Performance Report, and FY 2020-2023 Triennial Plan: Report to Congress*.

performance plans. Further, according to the Coast Guard's 2017 mission analysis of marine safety, there is no full set of metrics to measure performance and resource needs or to measure the scope of inspections performed.³⁸

The *DHS Workforce Planning Guide* calls for workforce planners to evaluate the contributions that workforce plans and associated initiatives make to strategic results.³⁹ To accomplish this, workforce planners should define performance measures with targets when they develop their plans to address workforce gaps, and the plans should include specific, measurable objectives that, when completed, ensure execution of the plan and result in progress toward closing identified workforce gaps. The guide further states that performance measures should describe the desired change or outcome when every initiative on the plan is complete, and agencies are to evaluate the outcomes of their workforce planning efforts using the performance measures. Further, according to the Coast Guard's 2012 *Marine Inspector Strategic Needs Assessment*, evaluation ensures that implemented initiatives actually close performance gaps.⁴⁰ The assessment stated that the Coast Guard could use surveys of marine inspectors over time to assess changes to gaps, for example, by determining how its marine inspection workforce initiatives affect marine inspector competency over time. The Coast Guard could also establish a target for the percentage of marine inspectors with all required competencies in each sector and measure progress with each iteration of the Competency Framework analysis.

Coast Guard officials stated that they currently use the Sector Staffing Model and Competency Framework to monitor progress on implementing initiatives and that the Sector Staffing Model is regularly evaluated and updated. However, Coast Guard officials acknowledged that the Sector Staffing Model measures staffing needs and does not measure the effectiveness of workforce initiatives. In addition, while the Competency Framework measures the percent of marine inspectors who have all of the required competencies, it does not include a target describing the desired outcome. These tools also do not define or provide a means to measure the desired end state or outcome for the Coast Guard's marine inspection workforce improvement plan or the initiatives contained within

³⁸U.S. Coast Guard, *Mission Analysis: Examination of Commercial Compliance Activities within the Marine Safety Mission*.

³⁹Department of Homeland Security, *DHS Workforce Planning Guide*.

⁴⁰U.S. Coast Guard, *Marine Inspector Strategic Needs Assessment*.

the plan. Developing performance measures with targets specific to its marine inspection workforce improvement plan and associated initiatives and using them to assess outcomes would better position the Coast Guard to determine the effectiveness of its efforts to address workforce needs.

Conclusions

The maritime transportation sector contributes nearly \$5.4 trillion annually to the U.S. economy. The demand for Coast Guard marine inspection activities has grown significantly over the last several decades and will most likely continue to do so in the foreseeable future. At the same time, the Coast Guard has faced long-standing challenges maintaining an adequate staff of experienced marine safety personnel to conduct marine inspections. While the Coast Guard's Sector Staffing Model estimates of the number of marine inspectors the Coast Guard needs for the upcoming year, it is not a forecasting tool. Collecting additional data—such as information on marine inspection retirement rates and industry trends—to forecast future trends in marine inspection supply and demand would enhance the Coast Guard's ability to identify potential future workforce needs and develop plans to address them. In addition, requiring both military and civilian marine inspectors to update their competency information in the human resources database—information the Coast Guard has identified as essential for making annual staffing decisions—and specifying when they should make such updates, would allow the Coast Guard to collect quality data for its tool to better align personnel with sector needs when making staffing decisions.

Further, the Coast Guard has implemented initiatives to address marine inspection workforce gaps but its initiative designed to define the optimal size and structure (pyramid) of an effective workforce is behind schedule, and the Coast Guard has not kept time frames or milestones current. Updating time frames and milestones could help the Coast Guard monitor progress made toward completing the initiative. Finally, by developing performance measures and assessing outcomes for its workforce improvement plan and associated initiatives, the Coast Guard could better determine how effective its efforts have been in enhancing the marine inspection program, which competes with other mission areas for resources.

Recommendations for Executive Action

We are making the following five recommendations to the Coast Guard.

The Deputy Commandant for Operations should collect additional data on the marine inspection workforce and maritime industry to forecast future workforce needs. (Recommendation 1)

The Deputy Commandant for Operations should require military and civilian marine inspectors to update their competency information in the Coast Guard's human resources database and specify when to make such updates. (Recommendation 2)

The Deputy Commandant for Operations should update time frames and milestones for the marine inspection workforce pyramid initiative through full implementation. (Recommendation 3)

The Deputy Commandant for Operations should develop performance measures with targets for the marine inspection workforce improvement plan and associated initiatives. (Recommendation 4)

The Deputy Commandant for Operations should assess the outcomes of the marine inspection workforce improvement plan and associated initiatives. (Recommendation 5)

Agency Comments

We provided a draft of this report to DHS for review and comment. In its comments, reproduced in appendix II, DHS agreed with all five of our recommendations. DHS also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees and the Secretary of the Department of Homeland Security. In addition, the report is available at no charge on the GAO website at <https://www.gao.gov>.

If you or your staff members have any questions about this report, please contact Heather MacLeod at (202) 512-8777 or macleodh@gao.gov. Contact points for our Office of Congressional Relations and Public

Affairs may be found on the last page of this report. GAO staff who made key contributors to this report are listed in appendix III.

A handwritten signature in black ink, appearing to read "H MacLeod". The signature is stylized with a large initial "H" and a cursive "MacLeod".

Heather MacLeod
Acting Director, Homeland Security and Justice Issues

Appendix I: Coast Guard Identified Advantages and Disadvantages of the Military and Civilian Marine Inspection Workforces

The Coast Guard uses both military and civilian workforces to conduct marine inspections. According to our analysis of 2020 Coast Guard data, approximately 80 percent of marine inspectors are military personnel and 20 percent are civilians. There are two types of military workforces conducting marine inspections—junior commissioned officers (junior officers) and chief warrant officers (warrant officers). Junior officers are largely involved in duties that provide direct or indirect leadership to day-to-day activities of Coast Guard forces, including the shore-based forces responsible for marine inspections. Junior officers enter the workforce through a variety of sources, including the Coast Guard Academy. Warrant officers are prior enlisted members of the Coast Guard selected to become specialized members of the officer corps. The Coast Guard also employs civilian marine inspectors, many of whom are retired Coast Guard military personnel.¹

When comparing the military and civilian positions of the marine inspection workforce, expertise, flexibility, and cost are at the core of their advantages and disadvantages. Military marine inspectors provide broad knowledge of Coast Guard operations, as well as flexibility, such as the ability to work nights and weekends without additional compensation. However, some of these inspectors may not have the same depth of knowledge about local ports and fleets, or they may have less experience than their civilian counterparts. According to Coast Guard performance plans and officials, a blend of military and civilian personnel is critical to building and sustaining consistency and competence, and we highlight, in

¹The Coast Guard also hires and trains civilians who are inexperienced in inspections to become marine inspectors through its civilian marine inspector apprenticeship program.

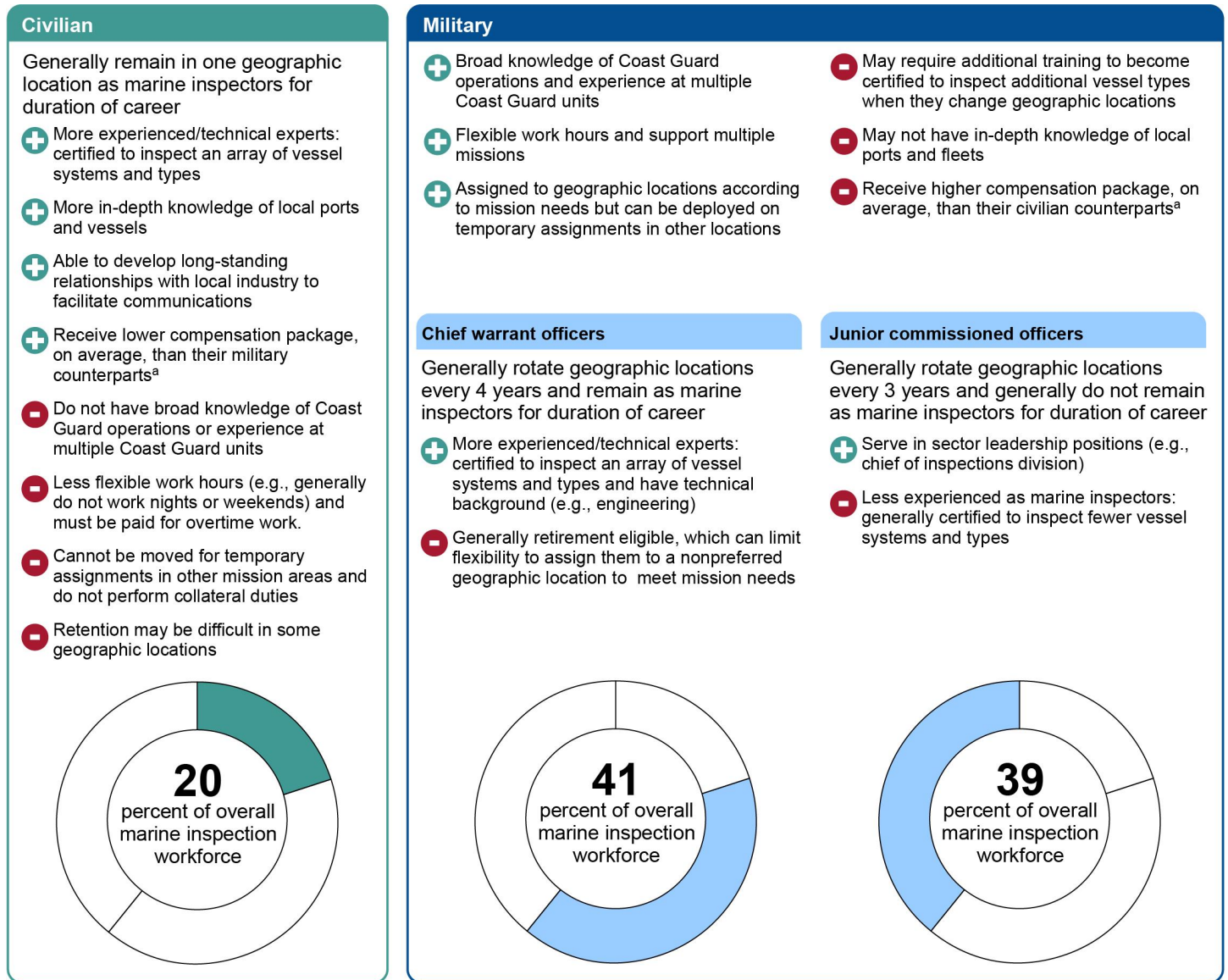
**Appendix I: Coast Guard Identified Advantages
and Disadvantages of the Military and Civilian
Marine Inspection Workforces**

figure 7 below, selected marine inspection workforce advantages and disadvantages identified by the Coast Guard.²

²See, for example, U.S. Coast Guard, *Marine Safety Performance Plan FY 2009-2014 and Maritime Prevention Program Performance Plan: Fiscal Years 2014-2019*. See also, U.S. Coast Guard, *Assessment of the Adequacy of the U.S. Coast Guard Marine Safety Workforce—2011* (Washington, D.C.: April 2012).

Appendix I: Coast Guard Identified Advantages and Disadvantages of the Military and Civilian Marine Inspection Workforces

Figure 7: Overview of Coast Guard-Identified Selected Advantages and Disadvantages of Its Military and Civilian Workforces for Marine Inspection Operations



Legend + Advantage - Disadvantage

Source: GAO analysis of U.S. Coast Guard information. | GAO-22-104465

Note: Workforce percentage data are as of November 2020.

^aCoast Guard officials stated that fiscal year 2021 data on annualized costs per position, a Journeyman civilian marine inspector billet is 14 percent less expensive than a warrant officer and 7 percent less expensive than a Journeyman junior officer.

**Appendix I: Coast Guard Identified Advantages
and Disadvantages of the Military and Civilian
Marine Inspection Workforces**

The five industry associations we met with offered various views on the advantages and disadvantages of military marine inspectors.³ Representative from two associations stated that they saw no difference in the expertise between military and civilian marine inspectors. Representatives from another association expressed concerns about the experience levels and expertise of junior officer marine inspectors. A representative from one of these associations said that it takes a marine inspector several years to learn about the local fleet and recognize which vessels typically have problems and that by the time a marine inspector learns these nuances, they rotate to a new location. Finally, a representative from a different association told us that both workforces are well trained and good partners.

³We did not ask representatives from industry associations a specific question about the advantages and disadvantages of these workforces, but they offered views on this issue.

Appendix II: Comments from the Department of Homeland Security

**Appendix II: Comments from the Department
of Homeland Security**

U.S. Department of Homeland Security
Washington, DC 20528



December 20, 2021

Heather MacLeod
Acting Director, Homeland Security and Justice Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Re: Management Response to Draft Report GAO-22-104465, "COAST GUARD:
Enhancements Needed to Strengthen Marine Inspection Workforce Planning
Efforts"

Dear Ms. MacLeod:

Thank you for the opportunity to comment on this draft report. The U.S. Department of Homeland Security (DHS or the Department) appreciates the U.S. Government Accountability Office's (GAO) work in planning and conducting its review and issuing this report.

The Department is pleased to note GAO's recognition that the Coast Guard implemented several initiatives as part of its workforce improvement plan to address marine inspection workforce needs in four key areas: (1) training and skills; (2) technology; (3) workforce staffing levels; and (4) workforce structure. For example, GAO highlighted the Coast Guard's successful implementation of a critical technology initiative to provide marine inspectors with mobile tablets containing pertinent reference material, as well as a key training initiative to establish national centers of expertise for specific vessel types. The Coast Guard remains committed to strengthening marine inspection workforce planning efforts by furthering data collection and forecasting efforts and completing ongoing workforce improvement plan initiatives.

The draft report contained five recommendations for the Coast Guard with which the Department concurs. Attached find our detailed response to each recommendation. DHS previously submitted technical comments addressing several accuracy and other issues under a separate cover for GAO's consideration.

**Appendix II: Comments from the Department
of Homeland Security**

Again, thank you for the opportunity to review and comment on this draft report. Please feel free to contact me if you have any questions. We look forward to working with you again in the future.

Sincerely,

JIM H CRUMPACKER Digitally signed by JIM H
CRUMPACKER
Date: 2021.12.20 12:30:48 -05'00'

JIM H. CRUMPACKER, CIA, CFE
Director
Departmental GAO-OIG Liaison Office

Attachment

Attachment: Management Response to Recommendations Contained in GAO-22-104465

GAO recommended that the Deputy Commandant for Operations:

Recommendation 1: Collect additional data on the marine inspection workforce and maritime industry to forecast future workforce needs.

Response: Concur. The Coast Guard’s Office of Shore Forces is designing a preliminary analytical model to forecast staffing needs for Coast Guard Marine Investigators, and anticipates receiving preliminary results from that model in the second quarter of fiscal year (FY) 2022. Pending results of the limited model and approval from the Deputy Commandant for Operations and the Deputy Commandant for Mission Support, the model could be accepted for full development to forecast the future needs of the entire Coast Guard Prevention Workforce, beginning in the first quarter of FY 2023. Estimated Completion Date (ECD): March 29, 2024.

Recommendation 2: Require military and civilian marine inspectors to update their competency information in the Coast Guard’s human resources database and specify when to make such updates.

Response: Concur. The Coast Guard’s Office of Shore Forces is working to ensure members update their competencies, as well as update the competency framework for the entire Prevention Workforce. The Coast Guard expects to complete framework updates by the second quarter of FY 2022, and will integrate the framework into personnel data management systems by the third quarter of FY 2023. ECD: June 30, 2023.

Recommendation 3: Update time frames and milestones for the marine inspection workforce pyramid initiative through full implementation.

Response: Concur. Estimated timeline and milestones for the marine inspection workforce pyramid initiative currently include:

Action	ECD
Deliver preliminary results of the analytical model to forecast staffing needs for Coast Guard Marine Investigators to the Deputy Commandant for Operations and the Deputy Commandant for Mission Support. This forecast of staffing needs forms part of the Coast Guard marine inspection workforce pyramid.	March 31, 2022

Appendix II: Comments from the Department of Homeland Security

Decision whether to develop the model to full-scale	June 30, 2022
Pending approval decision, begin development of full-scale model	December 30, 2022
Delivery new Prevention Workforce Pyramids using full model	March 29, 2024

Overall ECD: March 29, 2024.

Recommendation 4: Develop performance measures with targets for the marine inspection workforce improvement plan and associated initiatives.

Response: Concur. In June 2021, the Coast Guard promulgated the Prevention Program Readiness Initiative (PRI), and accompanying Action Plan, that provided a roadmap to improve the Coast Guard Prevention program readiness from calendar years 2021-2026. The Action Plan includes initiatives to “Develop Plan for Reducing Prevention workforce gaps,” “Present Modernized Prevention Workforce Structure Model,” and “Mature Competency Framework.” The Coast Guard’s Assistant Commandant for Prevention Policy also developed initial measures and targets for these initiatives, and is monitoring progress towards the completion of each initiative. ECD: October 31, 2022.

Recommendation 5: Assess the outcomes of the marine inspection workforce improvement plan and associated initiatives.

Response: Concur. The Coast Guard’s Assistant Commandant for Prevention Policy will periodically assess, and brief on a semi-annual basis, the progressive outcomes of the Prevention Program Readiness Initiative Action Plan to Senior Leadership beginning in the second quarter of FY2022 ECD: March 31, 2022.

Accessible Text for Appendix II: Comments from the Department of Homeland Security

December 20, 2021
Heather MacLeod
Acting Director, Homeland Security and Justice Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Re: Management Response to Draft Report GAO-22-104465, “COAST GUARD:
Enhancements Needed to Strengthen Marine Inspection Workforce Planning Efforts”

Dear Ms. MacLeod:

Thank you for the opportunity to comment on this draft report. The U.S. Department of Homeland Security (DHS or the Department) appreciates the U.S. Government Accountability Office’s (GAO) work in planning and conducting its review and issuing this report.

The Department is pleased to note GAO’s recognition that the Coast Guard implemented several initiatives as part of its workforce improvement plan to address marine inspection workforce needs in four key areas: (1) training and skills; (2) technology; (3) workforce staffing levels; and (4) workforce structure. For example, GAO highlighted the Coast Guard’s successful implementation of a critical technology initiative to provide marine inspectors with mobile tablets containing pertinent reference material, as well as a key training initiative to establish national centers of expertise for specific vessel types. The Coast Guard remains committed to strengthening marine inspection workforce planning efforts by furthering data collection and forecasting efforts and completing ongoing workforce improvement plan initiatives.

The draft report contained five recommendations for the Coast Guard with which the Department concurs. Attached find our detailed response to each recommendation. DHS previously submitted technical comments addressing several accuracy and other issues under a separate cover for GAO’s consideration.

Again, thank you for the opportunity to review and comment on this draft report. Please feel free to contact me if you have any questions. We look forward to working with you again in the future.

Sincerely,

JIM H. CRUMPACKER, CIA, CFE
Director
Departmental GAO-OIG Liaison Office

Attachment

Attachment: Management Response to Recommendations Contained in GAO-22-104465

GAO recommended that the Deputy Commandant for Operations:

Recommendation 1: Collect additional data on the marine inspection workforce and maritime industry to forecast future workforce needs.

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**Appendix II: Comments from the Department
of Homeland Security**

Action	ECD
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Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Heather MacLeod at (202) 512-8777 or macleodh@gao.gov

Staff Acknowledgments

In addition to the contact named above, Paul Hobart (Assistant Director), Dawn Hoff (Assistant Director), Susanna Kuebler (Analyst-in-Charge), Elizabeth Dretsch, Eric Hauswirth, Dave Hooper, Dainia Lawes, Matt Lowney, Steven Lozano, and Kevin Reeves made key contributions to this report.

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