



December 2017

COMMERCIAL FISHING VESSELS

More Information Needed to Improve Classification Implementation

GAO Highlights

Highlights of [GAO-18-16](#), a report to congressional committees

Why GAO Did This Study

Commercial fishing has one of the highest death rates of any industry in the United States. Fishing vessels that are at least 50 feet long and were built after 2013 are required by law to be built and maintained to rules developed by a classification society, a process known as classing. Congress created an alternative-to-class approach in 2016, allowing certain size vessels to be designed and built to equivalent standards in lieu of classing.

The Coast Guard Authorization Act of 2015 included a provision for GAO to review the costs and benefits of classing commercial fishing vessels. This report assesses (1) known numbers and rates of commercial fishing vessel accidents, injuries, and fatalities; (2) what is known about the costs, effects, and benefits of constructing and maintaining classed vessels; and (3) how the alternative-to-class approach compares with classing. GAO collected data on vessel accidents, injuries, and fatalities; interviewed vessel owners, builders, classification societies, Coast Guard, and other agencies; and studied classing costs.

What GAO Recommends

Among GAO's recommendations, the Coast Guard and other agencies should form a working group to collect reliable data on the number of active fishing vessels. The Coast Guard should also issue regulations or guidance to address questions about the alternative-to-class approach. The agencies generally concurred with the recommendations, but DHS did not concur that the Coast Guard assess vessel accident rates. GAO revised this recommendation to allow the Coast Guard or another appropriate agency to do the assessment.

View [GAO-18-16](#). For more information, contact Timothy J. DiNapoli at (202) 512-4841 or dinapolit@gao.gov.

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What GAO Found

The Coast Guard, the only military service within the Department of Homeland Security (DHS), investigated 2,101 commercial fishing vessel accidents between 2006 and 2015 that occurred in federal waters; however, because there are no reliable data on the total number of commercial fishing vessels that are actively fishing, rates of accidents, injuries, and fatalities cannot be determined. Agencies, such as the Coast Guard, keep records of accidents, but without reliable data on active vessels, trend information cannot be determined. The Coast Guard and the National Marine Fisheries Service have separate efforts to collect data that could be used to develop an estimate of active commercial fishing vessels, but each agency is taking a different approach to do so. These and other agencies agreed that it is important to calculate rates to assess commercial fishing vessel accidents, injuries, and fatalities. Establishing a mechanism—such as a working group—to coordinate efforts and collect reliable data on the number of active vessels and key characteristics, such as vessel age and length, would allow the agencies to do so in an efficient manner.

Commercial Fishing Vessel



Source: GAO. | GAO-18-16

While data on the costs to design, construct, and maintain classed vessels are limited, vessel owners, builders, and classification societies agree that classification increases costs and told GAO that the perceived costs of classing may affect vessel owners' decisions to purchase new vessels to avoid classification requirements. However, they also agree that classification is one of many factors that contribute to safety.

The alternative-to-class approach is more flexible than classing—for example, in its use of marine surveyors to verify vessel construction. Industry stakeholders and GAO's analysis, however, identified numerous questions and uncertainties regarding implementation of the approach, including licensing requirements for naval engineers and architects. The Coast Guard has not issued regulations or guidance to address these issues on the alternative-to-class approach due, in part, to its ongoing efforts to issue regulations to implement safety-related legislation enacted in 2010 and 2012. However, without specific written procedures—either in the form of regulations or guidance—the Coast Guard cannot ensure consistent implementation of the alternative-to-class approach.

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Abbreviations

ABS	American Bureau of Shipping
ASCP	Alternate Safety Compliance Program
DHS	Department of Homeland Security
DNV GL	Det Norske Veritas Germanischer Lloyd
NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanic and Atmospheric Administration
NTSB	National Transportation Safety Board

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December 14, 2017

The Honorable John Thune
Chairman
The Honorable Bill Nelson
Ranking Member
Committee on Commerce, Science, and Transportation
United States Senate

The Honorable Bill Shuster
Chairman
The Honorable Peter DeFazio
Ranking Member
Committee on Transportation and Infrastructure
House of Representatives

Commercial fishing has one of the highest death rates of any industry in the United States and vessel disasters are the leading cause of fatalities among fishers, according to the National Institute for Occupational Safety and Health (NIOSH). Commercial fishing is a diverse, highly fragmented industry in the United States that includes federal management of 474 fish stocks and stock complexes. The vessels used in commercial fishing—including catcher, processing, and tender vessels—are similarly diverse, and can vary in size, type, and style due to differences in fisheries and the regions in which the vessels operate.

The International Maritime Organization—a specialized agency of the United Nations that is responsible for regulating vessels and ships at sea—establishes requirements through international conventions. Among other things, these conventions are intended to ensure maritime safety and security through, for example, the requirement for load lines, meaning where the waterline should reach when a vessel is properly loaded. International requirements also stipulate that vessels be designed, constructed, and maintained in accordance with the rules of a recognized classification society or with national standards that provide

an equivalent level of safety. However, commercial fishing vessels have generally been exempted from these requirements.¹

Since 1988, U.S. law has required one type of commercial fishing vessel—processing vessels—to be built and maintained to rules developed by a classification society, a process known as classing.² In 2010 and 2012, Congress expanded classing requirements to the remaining two types of vessels—catcher and fish tender vessels—that are at least 50 feet long and built after July 1, 2013.³ Congress amended these requirements in 2016, creating an alternative-to-class approach, which allows 50-79 foot catcher or tender vessels built after February 8, 2016, to be designed and built to equivalent standards and overseen by a marine surveyor in lieu of classing.⁴

The Coast Guard Authorization Act of 2015 included a provision for GAO to review commercial fishing vessel safety, including the costs and benefits of classing commercial fishing vessels. This report assesses (1) what is known about the numbers and rates of commercial fishing vessel accidents, injuries, and fatalities; (2) what is known about the costs to construct and maintain classed commercial fishing vessels built since July 2013 (after expanded classification requirements took effect) and the effects of classing on vessel builders and owners; (3) the benefits associated with classing commercial fishing vessels; and (4) how the alternative-to-class approach compares with building and maintaining commercial fishing vessels to classification society standards.

¹In 1977, member states of the International Maritime Organization concluded the International Convention for the Safety of Fishing Vessels in Torremolinos, Spain, and developed safety requirements principally for new commercial fishing vessel construction. Despite subsequent agreements in 1993 and 2012, which limited some of the requirements, not enough member states have signed on to enable the requirements to take effect.

²Commercial Fishing Industry Vessel Safety Act of 1988, Pub. L. No. 100-424.

³The Coast Guard Authorization Act of 2010 required classification of catcher and tender vessels at least 50 feet in length built after July 1, 2012, and to which 46 U.S.C. § 4502(b) applies (section 4502(b) applies to vessels that operate beyond 3 nautical miles from the baseline from which the territorial sea of the United States is measured; with more than 16 individuals on board; or, in the case of a fish tender vessel, that engages in the Aleutian trade). The Coast Guard and Maritime Transportation Act of 2012 amended this provision to apply to such vessels built after July 1, 2013. Pub. L. No. 111-281, § 604(e) and Pub. L. No. 112-213, § 305(c) (codified, as amended, at 46 U.S.C. § 4503).

⁴Coast Guard Authorization Act of 2015, Pub. L. No. 114-120, § 318(a)(3)-(4) (2016).

To assess what is known about the number and rates of commercial fishing vessel accidents, injuries and fatalities, we collected and analyzed data from the Coast Guard's Marine Information for Safety and Law Enforcement database on commercial fishing vessel investigations to identify the number of commercial fishing vessel accidents, injuries, and fatalities that occurred in federal waters for calendar years 2006 through 2015. To assess the reliability of the data, we reviewed relevant documentation, spoke with knowledgeable agency officials, and performed electronic testing for obvious errors in accuracy and completeness. We determined that the data were sufficiently reliable for reporting the overall number of accidents, injuries, and fatalities from 2006 through 2015. Using latitudinal and longitudinal information collected during the Coast Guard's investigation of each accident, we limited our analysis to those accidents that involved U.S. vessels and occurred between 3 nautical miles and 200 nautical miles from shore, an area generally referred to as U.S. federal waters. For 243 observations, we found errors in the longitudinal and latitudinal data and could not match these accidents to an accurate location; we excluded these observations from our analysis. We attempted to analyze the number of commercial fishing vessel accidents, injuries, and fatalities by fishery—meaning the area in which a certain type of fish (e.g., shrimp, salmon, crab) is caught—but we found that the geographic area in which each accident occurred is not sufficiently reliable for determining the fishery in which a commercial fishing vessel operates.⁵

We requested data from the Coast Guard, NIOSH, and the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service on the population of commercial fishing vessels that actively fished over this period, but although the Coast Guard and the National Marine Fisheries Service collect data on commercial fishing vessels and fishing permits, respectively, the data are not reliable for determining the number of vessels that were actively fishing, landing, and selling their catch each year. These data reliability problems precluded us from calculating rates of accidents, injuries, or fatalities. We collected and analyzed data from NIOSH's Commercial Fishing Incident Database on commercial fishing fatalities for 2006 through 2015, and examined reports from the National Transportation Safety Board's (NTSB) investigations of commercial fishing vessel accidents over this period. We interviewed Coast Guard, NIOSH, and NTSB officials regarding the investigations and

⁵A fishery is the combination of one or more fish stocks, and fishing for such fish stocks.

analyses they have conducted on commercial fishing vessel accidents and recommendations they have made to improve safety on board these vessels.

To assess what is known about the costs to construct and maintain classed commercial fishing vessels built since July 2013 and the effects of classing on vessel builders and owners, we collected data on the costs associated with constructing and maintaining classed commercial fishing vessels from vessel builders and owners willing to share this information. Specifically, we analyzed (1) classification society fees quoted to two vessel builders located in the Gulf of Mexico and Pacific regions and other documentation these builders provided, including a construction bid; (2) another vessel builder's cost estimate for constructing a 90 foot long classed commercial fishing vessel to be used in the Gulf of Mexico shrimp industry; and (3) documentation provided by one vessel owner and another individual with extensive experience in the commercial fishing industry that reflected the cost differential between certain class and non-class certified equipment. The findings based on these data are not generalizable, but they do provide some insight into the additional costs associated with constructing a classed commercial fishing vessel.

We interviewed three marine underwriters who insure commercial fishing vessels off the coast of the Gulf of Mexico, Pacific Ocean, and the Atlantic Ocean to discuss how classification affects insurance premiums. We conducted three discussion sessions with stakeholders in the commercial fishing industry and interviewed 36 commercial fishing vessel owners and/or operators, representatives from 4 commercial fishing trade organizations, 13 vessel builders, and 3 recognized classification societies in the United States, as well as marine safety experts, naval architects, and academics who study commercial fishing vessel safety.

To assess the benefits associated with classing commercial fishing vessels, we obtained the perspectives of vessel owners and/or operators, vessel builders, commercial fishing trade organizations, and classification societies during the interviews and discussion sessions described above. We reviewed Coast Guard and NIOSH studies related to improving commercial fishing vessel safety and the benefits each found with respect to classing commercial fishing vessels or improved accident outcomes. We also collected data on the number of insurance claims submitted by commercial fishing vessel owners from 2013 through 2016 to two of the three marine underwriters we interviewed and who were willing to share this information to determine the number of hull and machinery claims

and the number of protection and indemnity claims that these companies processed over the period.

To compare the alternative-to-class approach to building and maintaining commercial fishing vessels to classification society standards, we compared the design, construction, and maintenance processes of each approach to identify similarities and differences between the two approaches. We interviewed Coast Guard officials to discuss the current policies and regulations in place to address commercial fishing vessels and how an alternative-to-class approach will be implemented. We also collected information on commercial fishing vessel classification requirements from a non-generalizable sample of four comparison countries—Canada, Denmark, Spain, and the United Kingdom—that are, along with the United States, members of the Organization for Economic Cooperation and Development and have fishing industries similar to those of the United States. We examined the classification requirements for commercial fishing vessels, including vessel length at which requirements apply, for the selected countries and discussed the requirements with officials from the selected countries. We present this analysis in appendix I.

Appendix II provides additional information on our scope and methodology.

We conducted this performance audit from June 2016 to December 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

There are three main types of U.S. commercial fishing vessels:⁶

- **catcher vessels** that catch fish and deliver them to shore for processing;

⁶A fishing vessel commercially engages in the catching, taking, or harvesting of fish or an activity that can reasonably be expected to result in the catching, taking, or harvesting of fish. 46 U.S.C. § 2101(11a).

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- **tender vessels** that purchase and transport fish from catcher vessels and resupply fishers with food, fuel, and other necessities;⁷ and
 - **fish processing vessels** that both catch and process fish at sea.⁸

Commercial fishing vessels are also characterized by the type of fishing gear used, such as trawl nets, seine nets, gill nets, traps and pots, dredges, and hook and line. The targeted fish species determines the type of vessel and gear that fishers use in their operations. A commercial fishing vessel may participate in multiple fisheries, using various fishing gear, as needed.

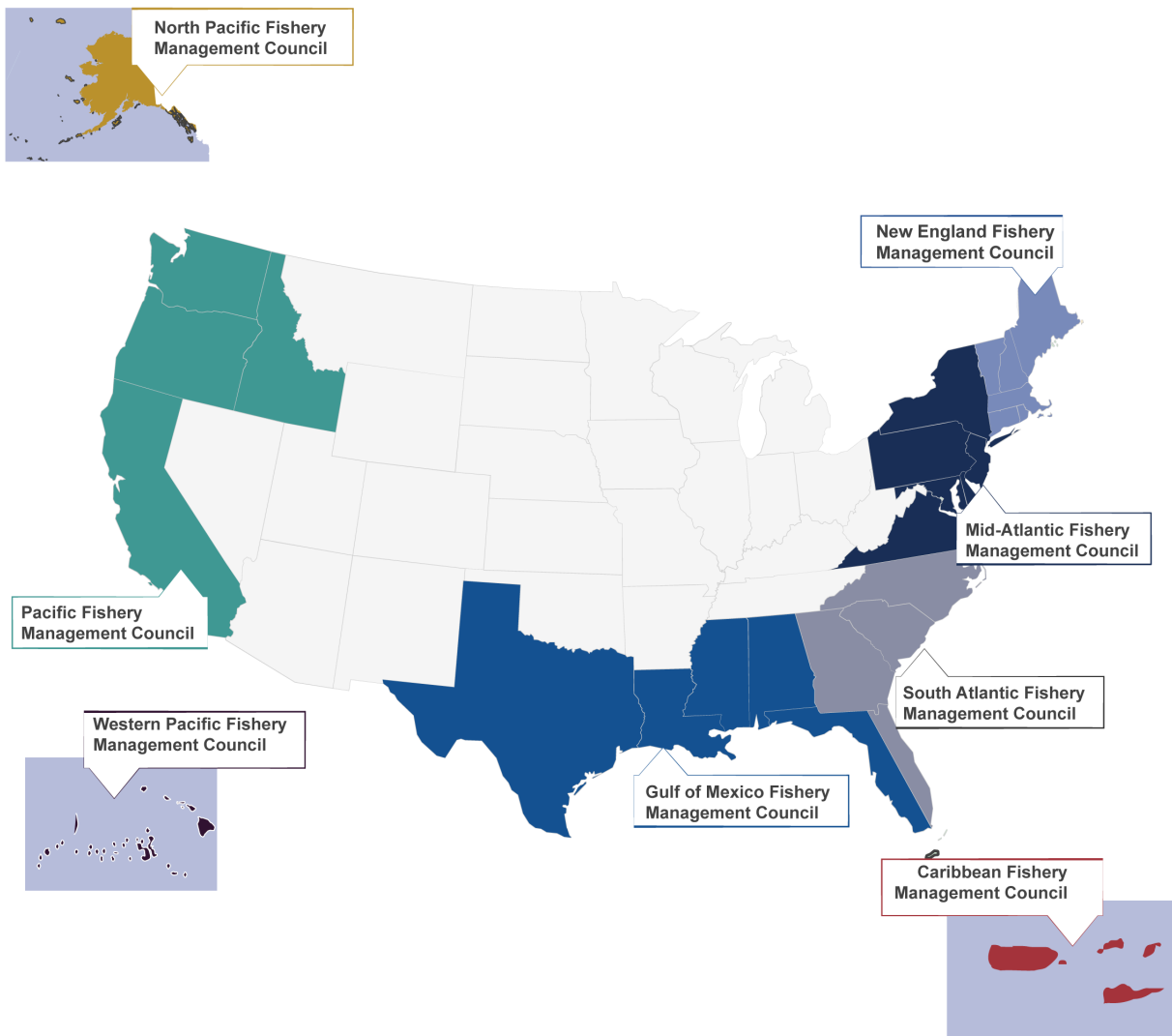
The Magnuson-Stevens Fishery Conservation and Management Act, as amended, provides for the conservation and management of fishery resources within the federal waters of the United States.⁹ The act defines “commercial fishing” to mean fishing in which the fish harvested, either in whole or in part, are intended to enter commerce or enter commerce through sale, barter, or trade. This act also created eight regional fishery management councils, which are responsible for preparing fishery management plans and setting annual catch limits for the fisheries within their areas of authority. NOAA’s National Marine Fisheries Service, under authority delegated from the Secretary of Commerce, provides support for regional fishery management councils and approves and implements fishery management plans and plan amendments. Figure 1 illustrates the eight fishery management councils.

⁷A fish tender vessel commercially supplies, stores, refrigerates, or transports fish, fish products, or materials directly related to fishing or the preparation of fish to or from a fishing, fish processing, or fish tender vessel or a fish processing facility. 46 U.S.C. § 2101(11c).

⁸A fish processing vessel commercially prepares fish or fish products other than by gutting, decapitating, gilling, skinning, shucking, icing, freezing, or brine chilling. 46 U.S.C. § 2101(11b).

⁹Pub. L. No. 94-265 (1976), codified, as amended, at 16 U.S.C. §§ 1801 et seq. The United States’ federal waters—also called the Exclusive Economic Zone—begin at the seaward boundary of each of the coastal states (generally 3 nautical miles from shore) and extends to 200 miles from shore. In the instances of Texas, Puerto Rico, and the Gulf side of Florida, federal waters begin 9 nautical miles from shore.

Figure 1: U.S. Fishery Management Councils



Source: National Oceanic and Atmospheric Administration's Office of Sustainable Fisheries. | GAO-18-16

U.S. Commercial Fishing Vessel Classification and Safety Requirements

Under federal statute, commercial fishing vessels are categorized as uninspected vessels and the Coast Guard generally does not have the authority to inspect the vessels during construction or regular maintenance. However, the Coast Guard is authorized to inspect all other

commercial vessels such as freight, offshore supply, passenger, tank, and towing vessels.¹⁰ Through the inspection process, the Coast Guard ensures that a vessel's structure is suitable, that equipment and accommodations are maintained in an operating condition consistent with safety of life and property conventions, and that the vessel complies with applicable marine safety laws and regulations.

Safety issues aboard commercial fishing vessels have been a long-standing concern. Various studies identified the problems and considered possible solutions to improve commercial fishing safety, but implementing improved safety recommendations were largely left to the vessel owner's discretion. Following the loss of entire commercial fishing vessel crews during the mid-1980s, Congress passed the Commercial Fishing Industry Vessel Safety Act of 1988, which required safety improvements and examination of commercial fishing vessels for safety equipment.¹¹

The act also instructed the Secretary of Transportation to conduct a study of the safety problems on fishing industry vessels and make recommendations on whether a vessel inspection program should be implemented. In 1991, the National Research Council conducted this study, which included a comprehensive assessment of commercial fishing vessel safety and identified a range of issues, including vessel fitness, and safety and survival equipment, among other things.¹² The Council found that developing casualty rates was hampered by the absence of reliable data on the number of fishing vessels, vessel material condition, exposure variables, and other factors. The Council recommended a holistic approach to fishing vessel safety, including establishing vessel and equipment standards as well as the development of a database to evaluate alternatives and monitor results. The Council stressed, however, the importance of balancing the anticipated benefits of a safety program with any costs that might be imposed through implementation. The Council also noted that classification costs would be borne principally by vessel owners and that the costs could be significant for individual vessel owners.

¹⁰46 U.S.C § 3301.

¹¹Pub. L. No. 100-424.

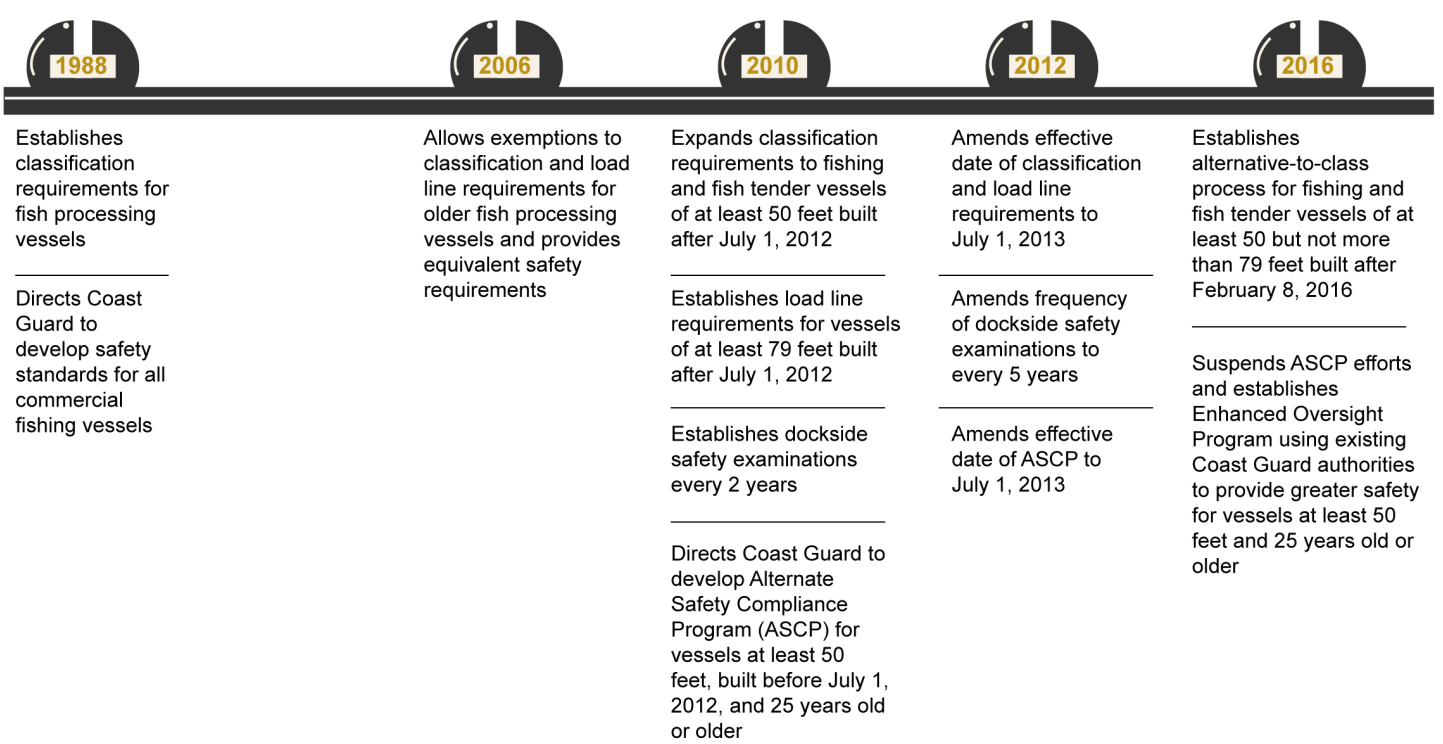
¹²Committee on Fishing Vessel Safety, National Research Council, *Fishing Vessel Safety: Blueprint for a National Program* (Washington, D.C.: National Academy Press, 1991).

Congress established classification requirements to address the construction and maintenance of fish processing vessels in 1988, and applied classification requirements to all types of commercial fishing vessels more broadly in 2010 and 2012 under the Coast Guard Authorization Act of 2010 and the Coast Guard and Maritime Transportation Act of 2012. In addition to classification requirements, Congress also established other requirements to improve vessel safety. For example, commercial fishing vessels that are 79 feet or longer, built after July 1, 2013, are required to have an assigned load line.¹³ A load line indicates the point where the waterline should reach when a vessel is properly loaded. Assignment of a load line, and issuance of a load line certificate, is conditional on the structural efficiency and satisfactory stability of the vessel, and on provisions provided for protection of the vessel and crew. As part of a load line certification, a vessel's seaworthiness is assessed by evaluating a vessel's watertight integrity, stability, and loading capacity. A vessel's stability booklet, prepared as part of a stability assessment, instructs operators on how to distribute weight across a vessel to prevent capsizing under different operating conditions.¹⁴ Figure 2 illustrates legislation and policy that addresses commercial fishing vessel construction and maintenance from 1988 to 2016.

¹³Pub. L. No. 111-281, § 604(d)(1) and Pub. L. No. 112-213, § 305(d)(1) (codified, as amended, at 46 U.S.C. §§ 5102-03).

¹⁴A stability test or assessment, also known as an inclining experiment, is a procedure to determine a vessel's lightweight (actual weight of the ship with no fuel, passengers, cargo, water, and the like on board) and is used in stability calculations to determine the appropriate loading conditions and the potential impact of fishing operations and weather on vessel stability (e.g., the ability of the vessel to return to its initial upright position).

Figure 2: Timeline of U.S. Commercial Fishing Vessel Classification and Safety Legislation and Policy



Source: GAO analysis of commercial fishing vessel legislation and Coast Guard policy. | GAO-18-16

Classification requirements differ by commercial fishing vessel type and length and are only applicable to vessels built after certain dates, as seen in table 1.

Table 1: Statutory Classification Requirements by Commercial Fishing Vessel Type and Length

Vessel type	Vessel length		
	Less than 50 feet	50-79 feet	Greater than 79 feet
Catcher and Tender	None	Vessels built after July 1,2013, must be classed or Vessels built after February 8, 2016, may follow an alternative-to-class approach in lieu of classing	Vessels built after July 1, 2013, must be classed
Processor	All processing vessels built or converted after July 27,1990, must be classed		

Source: GAO analysis of commercial fishing vessel legislation. | GAO-18-16

To address safety on older commercial fishing vessels, the 2010 and 2012 acts also directed the Secretary of Homeland Security to develop an alternate safety compliance program for commercial fishing vessels that

are at least 50 feet in length, built before July 1, 2013, and are 25 years or older.¹⁵ The Coast Guard drafted requirements for the program but, according to the Coast Guard, this program would have required a new rulemaking effort, and it suspended the effort in July 2016.¹⁶ At that time, the Coast Guard developed an Enhanced Oversight Program—through policy and its existing authorities—that focuses on older, non-classed commercial fishing vessels that may pose a greater risk of vessel and crew member loss. In addition, in January 2017, the Coast Guard issued a list of voluntary safety initiatives and good marine practices and encouraged vessel owners to implement these initiatives on all non-classed vessels where possible and reasonable. The Coast Guard is also currently working on aligning its existing regulations on commercial fishing vessels with the classification requirements introduced in the 2010 and 2012 acts.

Vessel Classification Process and Procedures

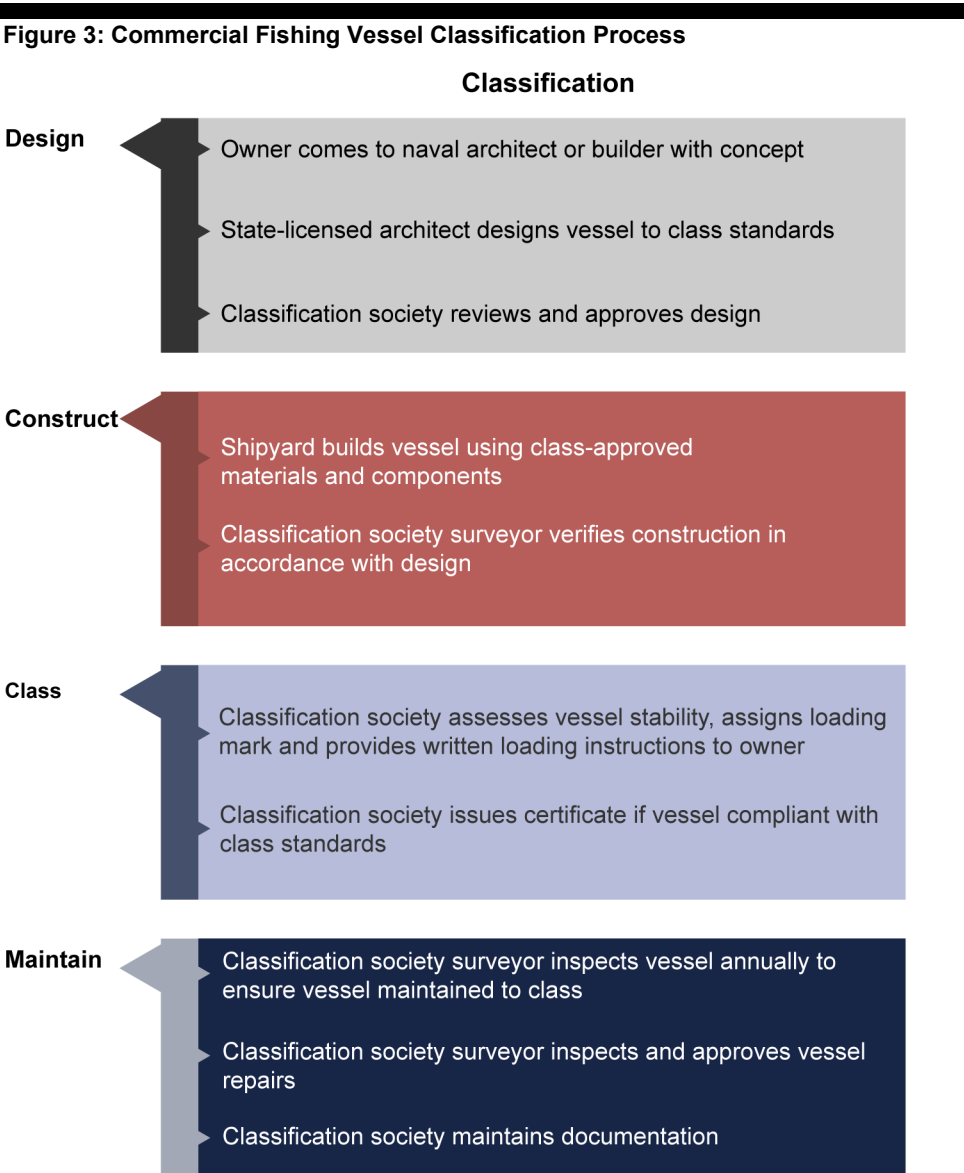
Through the classing process, classification societies, such as the American Bureau of Shipping (ABS), Det Norske Veritas Germanischer Lloyd (DNV GL), and RINA, address aspects of the vessel's design, structural integrity, reliability and function of major systems, and accident prevention.¹⁷ Classification societies (1) establish and maintain standards for the construction and classification of vessels and offshore structures; (2) supervise construction in accordance with these standards; and (3) carry out regular surveys of vessels in service to ensure the compliance with these standards. Once a vessel is "classed" with a certificate indicating that it meets a minimum level of safety and quality, the vessel is subject to periodic inspection to verify that it continues to meet the

¹⁵Pub. L. No. 111-281, § 604(e) and Pub L. No. 112-213, § 305(c) (codified, as amended, at 46 U.S.C. § 4503(d)).

¹⁶The general process by which federal agencies develop and issue regulations, referred to as notice-and-comment rulemaking, includes publication of a notice of proposed rulemaking in the Federal Register, allowing interested persons an opportunity to participate in the rulemaking process by providing written data, views, or arguments, and finally, publication of the final rule—including the agency's response to comments received on the proposed rule. This process gives the public an opportunity to provide information to agencies on the potential effects of a rule or to suggest alternatives for agencies to consider. 5 U.S.C. § 553.

¹⁷Under authorities in title 46 of the U.S. Code, the Coast Guard has entered into formal agreements with six classification societies that delegate certain statutory survey and certification functions for U.S. flagged vessels. In addition to ABS, DNV GL, and RINA, the Coast Guard has agreements with the following classification societies: Class NK, Lloyd's Register, and Bureau Veritas.

applicable rules of the issuing classification society, or risks losing its classification certificate, which could prevent the vessel from operating legally. Figure 3 illustrates the classification process for vessel design, construction, and maintenance.



Source: GAO analysis of Classification society rules. | GAO-18-16

Of the 39 U.S. fishing vessels classed by three societies, as shown in table 2, at least 29 are fish processing vessels.

Table 2: Number of U.S. Catchers, Tenders, and Fish Processors Classed as of July 2017

Classification society	Number of vessels	Vessel length (overall feet)
American Bureau of Shipping (ABS)	11	150-379
Det Norske Veritas Germanischer Lloyd (DNV GL)	21	136-376
RINA	7	67-342
Total	39	

Source: GAO analysis of classification society data. | GAO-18-16

Note: DNV GL is overseeing the construction of two additional vessels—one fish processing and one catcher vessel expected for completion in November 2017 and October 2018, respectively. RINA is currently overseeing the construction of one catcher vessel expected for completion in December 2018.

Although commercial fish processing vessels built or converted after July 27, 1990, are required by U.S. law to be classed, the law permits a vessel to be exempted from this and other statutory requirements under certain conditions. Few commercial fish processing vessels have an active class certificate. Older U.S. fish processing vessels—most of which operate off of the coast of Alaska—generally fall under the Coast Guard’s Alternative Compliance and Safety Agreement Program, which is implemented pursuant to exemption authority provided under law. Under this program, vessel owners apply with the Coast Guard for an exemption from classing and load line requirements so long as the vessel meets improved safety standards provided for under the program.¹⁸

Federal Agencies Involved in Commercial Fishing Vessel Safety

Several different federal agencies play a role in overseeing and promoting commercial fishing vessel safety:

¹⁸The Coast Guard’s Alternative Compliance and Safety Agreement Program, originally developed in 2006, is applicable to approximately 70 percent of the Bering Sea/Aleutian Island and Gulf of Alaska freezer longliner and freezer trawler fleet, which due to their age, are not eligible for classification. To qualify for enrollment into the program, vessel owner/operators voluntarily agree to comply with appropriate safety standards which will improve watertight integrity, vessel stability, fire prevention, machinery maintenance, lifesaving equipment usage, and crew member training.

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- **Coast Guard:** The only military service within the Department of Homeland Security (DHS), search and rescue activities and marine safety activities number among the Coast Guard's primary missions. As part of the safety activities, the Coast Guard performs mandatory safety inspections, conducts accident investigations, and promotes accident prevention involving vessels at sea. In 2015, the Coast Guard also began performing mandatory examinations of safety equipment onboard commercial fishing vessels.¹⁹ The Coast Guard records all interactions with vessels, including commercial fishing vessel accidents, in the Marine Information for Safety and Law Enforcement database. Coast Guard regulations require vessel operators to report a marine casualty involving damage to the vessel or other property; injury or loss of life; or harm to the environment.²⁰ The Coast Guard is also responsible for enforcing fishery management laws and regulations.
 - **National Institute for Occupational Safety and Health (NIOSH):** As part of the Department of Health and Human Services' Centers for Disease Control and Prevention, NIOSH is responsible for conducting research and making recommendations for new or improved work-related safety and health standards. For example, it has recommended that all fishing vessel operators conduct monthly safety drills as required by federal regulation; heed weather forecasts and avoid fishing in severe sea conditions; and maintain watertight integrity by examining and monitoring the hulls of their vessels.²¹ NIOSH maintains a Commercial Fishing Incident Database, which mostly is comprised of data on fishing industry fatalities abstracted

¹⁹46 U.S.C. § 4502(f).

²⁰Specifically, Coast Guard regulations define reportable marine casualties as (1) an unintended grounding or bridge allision (i.e., an unintended strike of a bridge), (2) an intended grounding, or bridge allision causing a hazard to navigation, the environment, vessel safety, or other damage; (3) loss of main propulsion, primary steering, or any associated component or control system that reduces the maneuverability of the vessel; (4) an occurrence materially and adversely affecting the vessel's seaworthiness or fitness for service or route; (5) loss of life; (6) injuries requiring professional medical treatment (beyond first aid) and for persons engaged or employed aboard, renders them unfit to perform routine duties; (7) an occurrence causing property damage in excess of \$25,000; or (8) an occurrence involving significant harm to the environment. 46 C.F.R. § 4.05-1.

²¹U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH), *Assessment of Safety in the Bering Sea/Aleutian Island Crab Fleet*, Publication No. 2016-112, April 2016, and *Fatal Occupational Injuries in the U.S. Commercial Fishing Industry: Risk Factors and Recommendations Alaska Region*, Publication No. 2011-103, November 2010.

and coded from reports of Coast Guard investigations of marine casualties.

- **National Transportation Safety Board (NTSB):** NTSB investigates commercial fishing vessel accidents that involve the most significant damage and loss of life.²² NTSB conducts investigations (sometimes in parallel with the Coast Guard) to determine the probable cause of vessel accidents and issues safety recommendations aimed at preventing future accidents.²³ For example, with regard to commercial fishing vessels NTSB recommends regularly conducting safety drills as well as proper training in stability and firefighting, and wearing a flotation aid at all times while working on deck.
- **National Marine Fisheries Service:** National Marine Fisheries Service uses fishery observers and at-sea monitors to collect data from U.S. commercial fishing vessels to monitor federal fisheries, assess fish populations, set fishing quotas, and inform fishery management practices. Under federal regulations, fishing vessels that may carry a fishery observer as part of a required or voluntary observer program generally must pass a Coast Guard commercial fishing vessel safety examination and be issued a safety decal. Further, under federal regulations, fishery conservation and management measures must, to the extent practicable, promote the safety of human life at sea, and should minimize or mitigate safety impacts where practicable.

²²These vessel accidents—which NTSB refers to as major marine casualties—are defined in NTSB regulations as a casualty resulting in (1) six or more fatalities; (2) property damage initially estimated as \$500,000 or more; (3) loss of a mechanically propelled vessel of 100 gross tons or more; or (4) serious threat to life, property or the environment by hazardous materials. 49 C.F.R. § 850.5(e).

²³See, for example, NTSB: *Safer Seas Digest 2016: Lessons Learned from Marine Accident Investigations*.

Number of Commercial Fishing Vessel Accidents, Injuries, and Fatalities Varied from 2006-2015, but Rates Cannot Be Determined

The Coast Guard investigated 2,101 commercial fishing vessel accidents between 2006 and 2015 that were identified as occurring in federal waters.²⁴ While the number of accidents in 2015 was greater than the number reported in 2006, the number of injuries and fatalities declined over the same 10-year period. We could not assess the number of accidents, injuries, and fatalities by fishery due to limitations with the Coast Guard's data. In addition, we were unable to calculate the rates of commercial fishing vessel accidents, injuries, and fatalities because reliable data on certain information needed to do so—including the total number of vessels that are actively fishing and the fishery or region in which the vessel operates—are either not maintained or are not collected by the Coast Guard or other federal agencies.

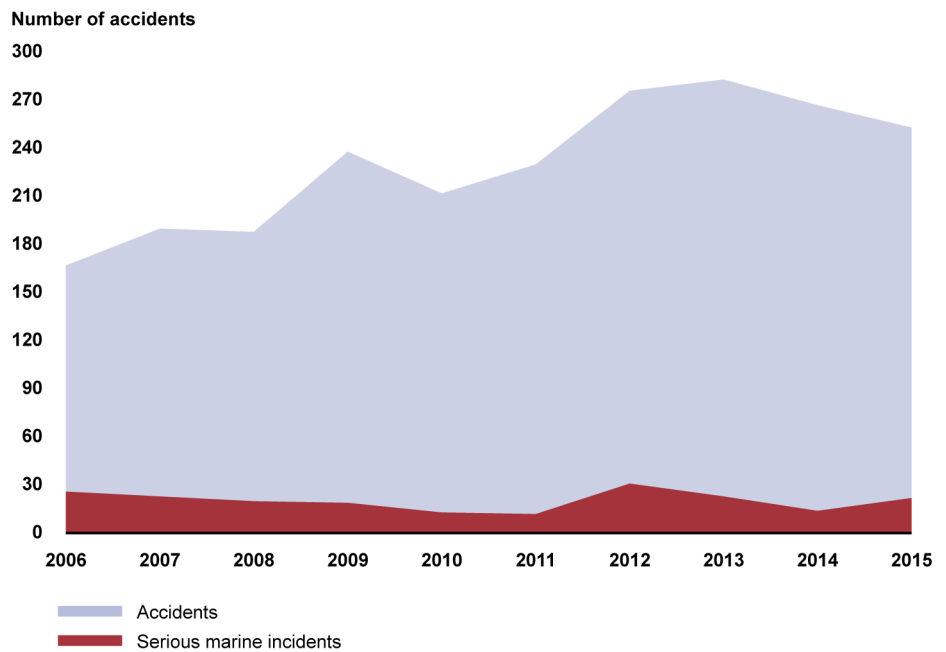
Number of Commercial Fishing Vessel Accidents in Federal Waters Varied from 2006-2015 and Instances of Injuries and Fatalities Have Declined

Between 2006 and 2015, the Coast Guard investigated 2,101 commercial fishing vessel accidents that occurred in federal waters. Coast Guard data indicates that the numbers of accidents generally increased through 2013 before falling slightly over the next two years, but remains above the level experienced in 2006. Of those, the Coast Guard investigated 193 serious marine incidents—those resulting in death, injury, or significant property damage, or involving environmental damage in federal waters.²⁵ Figure 4 shows the number of commercial fishing vessel accidents and serious marine incidents that occurred in federal waters for 2006 through 2015.

²⁴In this report, a commercial fishing vessel accident refers to instances where the Coast Guard responded after the vessel's crew reported a marine casualty involving damage to the vessel or other property, injury or loss of life, or harm to the environment. Accidents that did not occur in federal waters include, for example, those that occurred in state waters or misclassified observations. The United States' federal waters—also called the Exclusive Economic Zone—begin at the seaward boundary of each of the coastal states (generally 3 nautical miles from shore) and extends to 200 nautical miles from shore. In the instances of Texas, Puerto Rico, and the Gulf side of Florida, federal waters begin at 9 nautical miles from shore. The area within 3 nautical miles is generally referred to as state waters.

²⁵Serious marine incidents involve (1) any marine casualty or accident which is required to be reported to the Coast Guard and which results in one or more deaths, an injury requiring medical treatment beyond first aid, damage in excess of \$100,000, or actual or constructive total vessel loss; (2) discharges of oil in excess of 10,000 gallons; or (3) discharge of hazardous substances. 46 C.F.R. § 4.03-2.

Figure 4: Commercial Fishing Vessel Accidents and Serious Marine Incidents in Federal Waters, 2006-2015



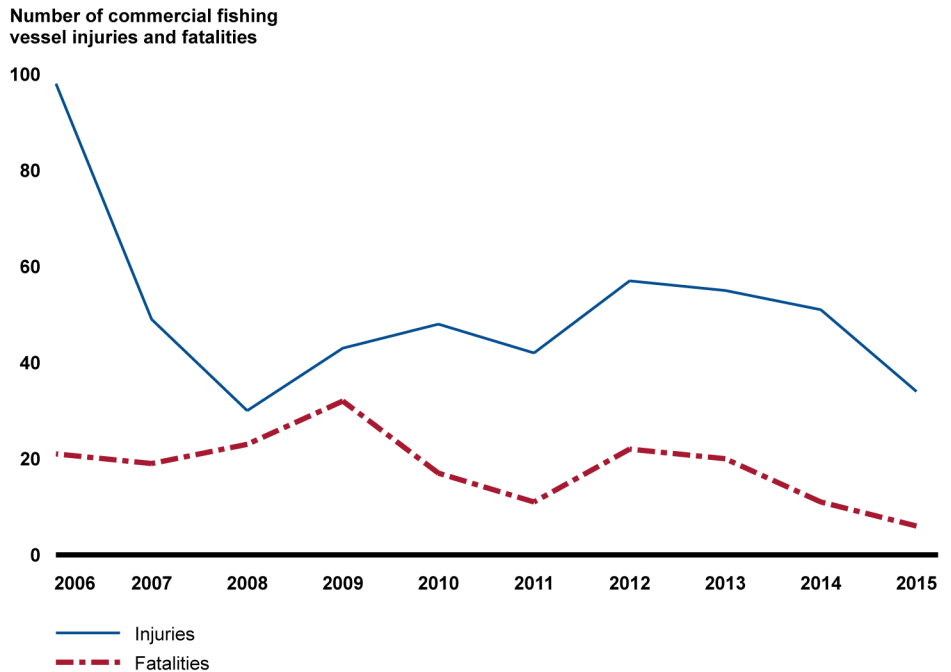
Source: GAO analysis of Coast Guard's Marine Information for Safety and Law Enforcement data associated with incident investigations involving commercial fishing vessels. | GAO-18-16

Note: This figure does not illustrate the rates of commercial fishing vessel accidents that occurred in federal waters from 2006 through 2015 because reliable data on the total number of commercial fishing vessels that were actively fishing over this period are not known.

From 2006 through 2015, 598 of 2,101 commercial fishing vessel accidents in federal waters resulted in an injury and/or fatality. These accidents resulted in a total of 507 injuries and 182 fatalities over this period.²⁶ Coast Guard data indicate that the number of injuries and fatalities have been declining since 2012, and 2015 figures are substantially below the levels reported in 2006, as seen in figure 5.

²⁶For the purposes of our analysis, we consider fatalities as instances where a fatality was reported and instances where an individual was reported as missing and is presumed dead. An accident may involve one or more injury and/or fatality.

Figure 5: Commercial Fishing Injuries and Fatalities in Federal Waters, 2006-2015



Source: GAO analysis of Coast Guard's Marine Information for Safety and Law Enforcement data associated with incident investigations involving commercial fishing vessels. | GAO-18-16

Note: This figure does not illustrate the rates of commercial fishing vessel accidents that occurred in federal waters from 2006 through 2015 because reliable data on the total number of commercial fishing vessels that were actively fishing over this period are not known.

Due to limitations with the Coast Guard's data, we were unable to portray numbers of accidents, injuries, or fatalities by fishery located in a specific geographic location. Although we identified the area in which each commercial fishing vessel accident occurred, using latitudinal and longitudinal information included in the Coast Guard's database, we could not reliably assign each accident, injury, or fatality to a fishery managed by interstate marine fisheries commissions or fishery management councils—entities which manage fishery resources in state and federal waters, respectively. National Marine Fisheries Service officials stated that even though an accident that occurred in an area of federal waters that falls within a jurisdiction of a particular council, the vessel may not have been participating in a fishery managed, either solely or in part, by that council. Data on a vessel's intended fishery on the day of the accident provides accurate information on the intended area in which a vessel should be operating. Assigning a commercial fishing vessel accident to a specific fishery management council on a solely geographic

basis—without consideration of the vessel’s targeted fishery—could overestimate the prevalence of accidents in a council jurisdiction. While the Coast Guard’s database includes a field for a vessel’s fishery, these data were not collected for the majority of commercial fishing vessel accidents between 2006 and 2015. An official in the Coast Guard’s Office of Investigations and Analysis stated that data on a vessel’s fishery is not required in order to complete an accident investigation and, therefore, may not be collected.

Federal internal control standards establish that management should obtain relevant, accurate data from reliable sources in a timely manner, and recommend that agencies’ management use quality information to make informed decisions and evaluate the entity’s performance in achieving key objectives and addressing risks. The lack of complete and reliable data on the vessel’s fishery in the Coast Guard’s database hinders efforts to assess whether particular fisheries experience higher numbers of accidents, injuries or fatalities than others. Such information would benefit the Coast Guard’s analysis of commercial fishing vessel accidents, injuries, and fatalities because information on a vessel’s fishery can be used for a regional analysis of these events.

Relevant Federal Agencies Do Not Collect Reliable Information on the Active Fleet to Enable Calculation of Rates

The Coast Guard and other federal agencies do not collect data on the total number of vessels that are actively fishing—those that are operating, landing, and selling catch—and we found that existing data on the population of commercial fishing vessels are not sufficiently reliable to calculate rates of commercial fishing vessel accidents, injuries, and fatalities. Data on the total number of commercial fishing vessels actively catching and processing fish are necessary to determine rates—the ratio of the number of accidents, injuries, and fatalities that occurred compared to the total number of active commercial fishing vessels. These rates, if based on reliable data, would establish trend information on the number of accidents involving commercial fishing vessels.

While the Coast Guard collects some data on commercial fishing vessels that operate in federal waters—including a vessel’s length and construction date—data on the population of the active U.S. commercial fishing vessel fleet are not reliably known. The Coast Guard’s National Vessel Documentation Center maintains a registry of valid certificates of documentation—that indicate that a vessel is registered with the Coast Guard and is greater than 5 net tons—for commercial fishing vessels that operate in federal waters. However, even when the Coast Guard could identify the number of documented vessels, we found the data they

provided were unreliable for determining the total number of commercial fishing vessels that are actively fishing. For example, a senior Coast Guard official estimated that more than 20 percent of the vessels documented in 2015 were not actively fishing and may not be operational or otherwise not in use. As part of vessel registration, the Coast Guard collects information on a vessel's length and date of construction. Other data, however, such as the fishery located in a specific geographic location in which a vessel operates, are not collected. Data on key characteristics of the total number of commercial fishing vessels actively fishing—including vessel length, age, and fishery or region of operation—would provide additional information when analyzing rates of commercial fishing vessel accidents, injuries, and fatalities.

Other federal agencies involved in the commercial fishing vessel industry also do not collect data on the total number of active U.S. commercial fishing vessels. Having a national count of federally-permitted commercial fishing vessels can be used, in part, to help determine the number of commercial fishing vessels that are actively fishing. Federal permits are required for commercial fishing vessels that fish in certain fisheries and, according to officials from the National Marine Fisheries Service, these fishing permits are issued by NOAA's regional offices and each regional office manages its own data. National Marine Fisheries Service officials stated that they are developing a national count of federally-permitted commercial fishing vessels, but a competing priority delayed this effort and noted it will recommence in the coming year. However, just because a vessel has a permit, it does not mean it is an active vessel, and additional data on vessel activity—such as information from log books, fish tickets, and fishery observers—is needed to identify vessels that are actively fishing.

Similarly, a statistician from NIOSH—the federal agency that maintains data on commercial fishing fatalities and is responsible for conducting research and making recommendations for the prevention of work-related injury and illness—stated that he has encountered challenges estimating the total size of the active U.S. commercial fishing fleet because the majority of commercial fishing vessels are state-registered, and comprehensive data on the number of state-registered vessels are not available. Coast Guard officials acknowledged that they do not collect data on a state-registered vessel, unless the Coast Guard has been in contact with the vessel.

Officials from the Coast Guard and the National Marine Fisheries Service agreed that it is important to calculate rates to assess the number of

commercial fishing vessel accidents, injuries, and fatalities. At present, however, no particular federal agency has collected or calculated the national number of active commercial fishing vessels—those that are fishing and selling their catch—or the region and fishery in which these vessels operate. Once a reliable count of the number of active commercial fishing vessels is established, rates can be calculated by other characteristics such as the fishery or fisheries in which a vessel operates or vessel length.²⁷ These rates would provide further insight into commercial fishing vessel accidents, injuries, and fatalities, including the percentage of vessels that are involved in an accident in a specific region or the percentage of accidents that involve vessels of a certain length such as, for example, vessels greater than 79 feet in length.²⁸

Federal internal control standards establish that management should obtain relevant data from reliable sources in a timely manner, and recommend that agencies' management use quality information to make informed decisions. The Coast Guard and the National Marine Fisheries Service are collecting data that could be used to develop an estimate of the total number of commercial fishing vessels that are actively fishing, however, each agency is taking a different approach, in part, because they are doing so for different purposes. Specifically, the Coast Guard collects data on commercial fishing vessels and the National Marine Fisheries Service collects data on permits for federally-managed fisheries, as well as other data on fishing activities. These data can be used, in part, to help determine the number of commercial fishing vessels that are actively fishing. In addition to the Coast Guard and the National Marine Fisheries Service, an agency, such as NIOSH—that is involved in commercial fishing vessel safety—could benefit from information derived from these ongoing efforts. Without such information, Congress and the

²⁷In July 2017, NIOSH published commercial fishing fatality rates for specific fisheries across the United States. See, for example, U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH), *Commercial Fishing Fatality Summary: Alaska Region*, Publication No. 2017-171, July 2017. However, without information on the total number of active commercial fishing vessels in the United States, national rates of commercial fishing vessel accidents, injuries, and fatalities cannot be calculated.

²⁸The mandate provision called for GAO to review national and regional trends with respect to rates of accidents and human injuries and deaths aboard or involving commercial fishing vessels greater than 79 feet in length that operate beyond the 3-nautical-mile demarcation line (i.e. in federal waters). Without data on the total number of vessels that comprised the U.S. commercial fishing vessel fleet, we could not calculate rates of accidents, injuries, and fatalities.

agencies will lack important data needed to accurately assess the factors that contribute to commercial fishing vessel accidents, injuries, and fatalities. Establishing a mechanism—such as a working group—to coordinate efforts and collect reliable data on the number of active vessels and key characteristics, such as vessel age and length, would allow the agencies to do so in an efficient manner.

While Data on the Costs of Classing Are Limited, Stakeholders Believe Classing Will Increase Ownership Costs

We were able to obtain limited data on the costs of classification because only a total of six classed vessels have been built and builders and owners were reluctant to provide data on costs which they consider to be proprietary. Classification society representatives, vessel owners, and builders we interviewed agreed, however, that constructing and maintaining classed commercial fishing vessels will increase ownership costs, due, in part, to the fees charged by classification societies, the requirement to use certified materials and equipment, and annual maintenance surveys, among other costs. Despite the uncertainty as to how much classification will increase total ownership costs, vessel builders and owners stated that the potential costs associated with classing have contributed to reduced orders for new vessels and other changes.

Extent to Which Classing Increases Design, Construction, and Maintenance Costs Is Uncertain

All stakeholders we interviewed—classification society representatives, vessel owners, and builders—stated that classing will increase ownership costs. These stakeholders identified the following additional costs associated with constructing a classed commercial fishing vessel:

- naval architect fees for vessel design;
- additional builder engineering costs associated with finalizing classed vessel design;
- classification society review of key equipment drawings and certification of equipment manufacturing;
- increased builder costs to construct vessel to classification society-approved design;
- additional supervision and testing during vessel construction;
- additional classification society design reviews and surveys, as needed, during vessel design and construction; and
- stability assessments and load line assignment.

However, we were able to obtain only limited data on these costs as (1) few vessels have been constructed and classed by the societies included in our review and (2) the owners/operators and builders of these classed vessels are reluctant to share the associated cost documentation, considering it proprietary. Only six vessels have been constructed and classed since July 2013, when expanded classification requirements took effect.²⁹ Two of these vessels—one tender and one catcher—were classed because they were subject to the July 2013 expanded classification requirements; the remaining four vessels were factory processors, which have been required to meet classification society standards since July 1990. All of the classed vessels constructed since July 2013 are greater than 130 feet in length and are owned by companies that own and operate multiple fishing vessels, with the exception of the tender vessel which is 67 feet long and owned and operated by a non-profit organization.

²⁹As previously discussed, under the Coast Guard Authorization Act of 2010 and Coast Guard and Maritime Transportation Act of 2012, Congress expanded classing requirements to catcher and fish tender vessels that are at least 50 feet long and built after July 1, 2013. Pub. L. No. 111-281, § 604(e) and Pub. L. No. 112-213, § 305(c)(1) (codified, as amended, at 46 U.S.C. § 4503).

Commercial Fishing Vessel

Vessel type: Trawler (catcher or catcher/processor)

Fleet length: 40-500 feet or longer

Trawlers fish for pollock, cod, sole, rockfish, shrimp, and other species by towing funnel-shaped nets behind them in which the catch is trapped by the forward movement of the boat. Depending on the desired catch, trawlers tow the nets in very shallow waters up to a depth of about 6,500 feet along the seafloor. Large, offshore factory trawlers can also process their catch on board. Freezer trawlers are outfitted with a refrigerating plant and freezing equipment.



Source: National Oceanic and Atmospheric Administration /Department of Commerce, photographer: William B. Folsom, National Marine Fisheries Service. I GAO-18-16

Two builders, located in the Gulf of Mexico and Pacific regions, provided quotes on classification society fees and a construction bid; another builder provided an estimate of the costs associated with designing and constructing a classed vessel approximately 90 feet in length. Collectively, this information indicates that the additional costs could range from approximately \$300,000 to \$1.2 million above the total construction cost of a vessel not built to these standards.

In general, vessel builders, owners, naval architects, marine safety experts, academics, and other experts we spoke with provided widely varying estimates on the impact that classification may have on vessel construction costs, though many suggested a range of 10 to 30 percent. In contrast, representatives from one classification society stated that shipbuilders who currently build other ships to classification requirements have stated estimates of 2.5 to 5 percent in overall construction costs would be needed to construct a classed fishing vessel. We could not, however, independently assess the accuracy of these claims.

With regard to classification society fees, classification society representatives stated that the fees they charge for vessel design approval and surveys conducted during the construction of a classed commercial fishing vessel vary depending on the complexity of the vessel's design, as well as the builder's level of expertise in constructing classed vessels. These fees typically account for 1.0 to 1.5 percent of the costs to design and construct a classed vessel. A builder on the West Coast provided us a quote from one of the classification societies of approximately \$136,000 for design reviews and construction surveys for a \$2 million, 58-foot commercial fishing vessel, or about 7 percent of the vessel's total construction costs. Another builder in the Gulf of Mexico stated that constructing a 90-foot commercial fishing vessel generally costs him approximately \$2.3 million, but constructing the same vessel with classification requirements would incur approximately \$195,000 in additional classification fees, about 8 percent of construction costs. A vessel owner who owns and operates two catcher vessels off the coast of Alaska and is currently constructing a 300-foot factory processing vessel estimated that classification fees for vessel design and construction would likely amount to \$300,000—approximately 0.4 percent—of the vessel's \$70 million total purchase price.

These fees included an initial review of the vessel's design and, generally, the review of one set of drawing revisions. If a builder needs to resubmit the vessel's design to the classification society for another review, each submission could be subject to additional fees.

Representatives from both ABS and DNV GL explained that the fees they charge do not account for additional design and oversight services that might be necessary during the construction process, especially if this is the first time that the vessel builder has constructed a classed vessel.

Vessel owners and builders told us that other costs associated with constructing a classed commercial fishing vessel include the use of certain materials, such as steel, and key equipment, such as generators and the engine, which may be more costly to purchase from the manufacturer since the items must be certified by the classification society. As part of classing, surveyors from classification societies are required to certify the fabrication and/or assembly of certain materials and key equipment prior to installation on the vessel. For example, two individuals—a vessel owner and someone with years of experience working in the commercial fishing industry—provided documentation that showed that two types of class certified equipment—generators and engines—cost approximately 6 to 16 percent more than the same, non-certified equipment. DNV GL representatives estimated that, in total, the class-certified materials and key equipment can cost an additional \$20,000-\$30,000 more than the cost of non-certified equipment.

Commercial Fishing Vessel

Vessel type: Trap Setter (catcher)

Fleet length: 66-164 feet

Trap Setter vessels are used for setting pots or traps on the seafloor for catching fish, lobsters, crabs, crayfish and other similar species. Smaller vessels may operate in coastal waters with larger vessels operating along the edge of the continental shelf. Smaller vessels are typically equipped with hydraulic or mechanical pot haulers, whereas the larger vessels are equipped with cranes for hauling 100 to 300 pots on board.



Source: National Oceanic and Atmospheric Administration /Department of Commerce, photographer: Michael Theberge, 2nd Mate Coastal Merchant. | GAO-18-16

Vessel owners we interviewed stated that they may incur additional costs to maintain a classed commercial fishing vessel over the vessel's lifetime. These costs include fees paid to classification society surveyors to conduct annual surveys—required as part of regular class maintenance—as well as periodic surveys—more extensive surveys generally required every 5 years—on the vessels. Representatives from one classification society estimated that, depending on size, age, and condition, the fees for fishing vessel annual surveys can range between \$1,500 and \$5,000, while the fees for periodic surveys can range between \$6,000 and \$25,000. Classification society representatives stated that the high end of the fees for periodic surveys are influenced by the fact that many owners choose to perform major maintenance, upgrades, and modifications at the same time, which increases the overall survey items and, therefore, the cost. Owners we interviewed stated that in addition to these annual survey fees, they are required to pay for the surveyor's travel costs as well as any necessary repairs the surveyor identifies. Those vessel owners we interviewed estimated that the annual maintenance costs for a classed commercial fishing vessel—including fees, travel costs, and repairs—could range from \$28,000 to as much as \$150,000. For example, an invoice we received from one vessel owner totaled over \$70,000. More than one-third of the total cost was due to fees for periodic, annual, and equipment surveys. The majority of the remaining costs were associated with the purchase and installation of new machinery and repairs made to the vessel, as well as travel expenses paid to the classification society.

Commercial Fishing Vessel

Vessel type: Longliner (catcher or catcher/processors)

Fleet length: Varies

Longliners deploy one or more fishing lines, each with a series of baited hooks hanging on smaller branched lines. Vessel size, capacity, and mechanical features determine how long the lines can be and how many hooks can be used per line. Fishing lines can range from less than 1 mile in length up to 40 miles in length. Factory long liners (typically over 148 feet in length) are generally equipped with a processing plant including mechanical gutting and filleting equipment with accompanying freezing installation, fish oil, fish meal and sometimes canning plants.



Source: National Oceanic and Atmospheric Administration (NOAA)/Department of Commerce, photographer: David Csepp, NOAA/National Marine Fisheries Service/Alaska Fisheries Science Center. | GAO-18-16

Vessel owners we interviewed, or received correspondence from, provided examples of potential challenges that arise when maintaining classed vessels, such as annual surveys being scheduled at a time or location that interferes with fishing operations; the unavailability of classification surveyors at a convenient location; and the time to obtain classed materials or equipment to be delivered before an emergency repair can be completed. One owner noted that he once waited 2 weeks and paid three times more to replace three square feet of classification society-certified steel. However, ABS representatives stated that vessel owners have a 6-month window to meet their annual survey requirement, and stated that ABS generally has two surveyors working in Alaska at any given time and the society is open to adding more surveyors in Alaska as needed. Similarly, DNV GL representatives stated that to mitigate the cost and time associated with surveyors' travel, the society has begun to use networked or stand-alone electronic devices to record certain non-major classing inspections.

Several industry representatives noted that some of the additional costs associated with constructing and maintaining classed vessels may be partially offset by decreased insurance premium costs and improved vessel resale value for vessel owners. Coast Guard officials we interviewed similarly noted that classed vessels may command a higher resale price. However, marine insurance underwriters we interviewed stated that prior claim history—not classification—is the key factor that influences insurance premiums for commercial fishing vessels. One of the underwriters added that owners of classed commercial fishing vessels might actually pay higher insurance premiums than owners of non-classed vessels because hull and machinery claims for classed vessels would likely be more expensive to repair. With regard to whether a classed commercial fishing vessel has a higher resale value, we spoke to some vessel owners who stated that the maintenance costs associated with owning a classed vessel would actually deter them from purchasing an existing classed vessel.

Commercial Fishing Stakeholders' Views on the Potential Impact of Classing

Many of the stakeholders we spoke with told us that classing and its associated costs have and will continue to change aspects of the commercial fishing business, including profitability and construction of new vessels. Several stakeholders stated that their ability to absorb the additional costs due to classing is dependent on the relative health of the fishing businesses involved. Vessel owners we interviewed in less profitable regions and fisheries, such as the shrimp fishery in the Gulf of Mexico and the groundfish fishery in the North Atlantic, believed that their

businesses will be adversely impacted by the increased construction costs associated with classing. One vessel owner, whose small-scale commercial fishing operation in the Gulf of Mexico employs approximately 40 individuals and operates 3 vessels, estimated that constructing a vessel to meet classification society standards would increase overall construction costs by 30 percent, an amount she believes that she cannot absorb as shrimp prices are sensitive to the international market.

While vessel owners in more profitable regions and fisheries believed that their businesses could absorb the increased construction costs associated with classing, one owner whose family has fishing operations in 10 different fisheries, some of which are profitable and some that are less so, noted that the addition of a newly constructed classed vessel to his fleet—which he estimated cost about 35 percent more due to classing requirements—was still a sound business decision on his part since the vessel will operate in the more profitable North Pacific fishery. However, he added that his family would not incur similar costs to construct a new classed vessel to operate in the scallop industry, in which they also have business operations.

Another issue that arose in our discussions with stakeholders was that the perception of the increased cost associated with constructing a classed commercial fishing vessel—regardless of what the actual cost increase may be—appears to be affecting vessel owners' decisions to purchase new vessels. Among the 13 vessel builders we interviewed, 9 builders stated that classification requirements and their perceived costs have contributed to a significant reduction in orders for new commercial fishing vessels, regardless of vessel length. One builder noted that he reduced the number of employees from nearly 100 to less than 50 workers and began constructing other vessels, such as tug boats, in addition to commercial fishing vessels to keep his remaining employees employed.

Commercial Fishing Vessel

Vessel type: Seiner (catcher)

Fleet length: 20-200 feet

Seiners fish with a net called a seine that is laid out in a circle around a school of fish and drawn into a purse that closes the bottom, trapping the catch inside. Seiners are used most notably in fisheries for salmon, herring, tuna, and menhaden. Like other modern fishing vessels, seiners can vary by the types of equipment that are used and the geographical region in which they operate. Until the 1960s, pursing and hauling the seine was done by hand, but now most fishers use mechanized winches to do the job.



Source: National Oceanic and Atmospheric Administration /Department of Commerce. I GAO-18-16

One industry representative stated that owners, especially those with smaller operations in less profitable fisheries, may find it cost prohibitive to recapitalize their vessel or fleet. Similarly, vessel owners stated that they will likely choose to continue operating their aging vessels or choose to close their business in lieu of purchasing new classed vessels.

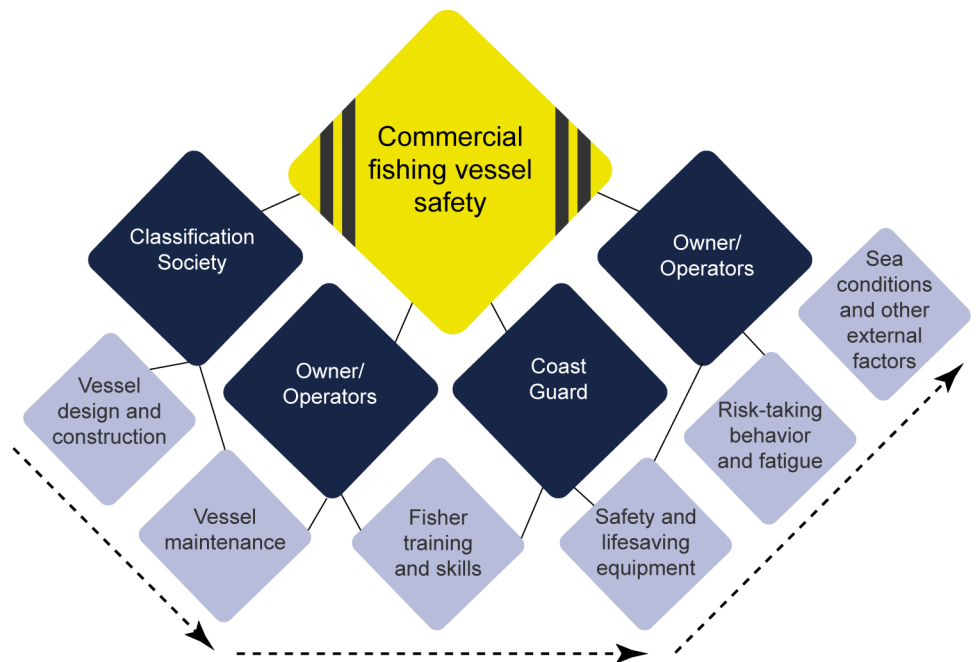
Other vessel owners stated that they would either consider, or already have chosen, to purchase and update an older commercial fishing vessel instead of constructing a new classed vessel. For example, one vessel owner we interviewed, whose family has fished commercially along the Gulf of Mexico for 150 years, stated that the new classing requirements for commercial fishing vessels have resulted in several businesses rebuilding older vessels, where a new vessel is constructed around the original keel of an older vessel that is not subject to classing requirements. Another vessel owner we interviewed, whose family also has a history in commercial fishing, told us that he and other members of his family would like to build several new vessels to add to their already sizable fleet, but have decided not to do so because of the perceived costs associated with the classing process. Instead, this vessel owner commented that some members of his family recently purchased two wrecked commercial fishing vessels and intend to construct a new vessel using the wrecked vessel's 40-year-old keel.

Industry trade representatives also voiced concerns that when owners choose to recapitalize their vessels, classing requirements could encourage owners to purchase smaller vessels to avoid classification requirements. For example, one builder we interviewed offers a design for a 45 to 49 foot crab vessel, which, because of its size, would not be subject to classification requirements. The builder explained that the vessel would be shorter than other vessels operating in the Bering Sea and could be less safe for the crew onboard in the event of an accident. Further, naval architects we interviewed stated that they know of vessel owners who have begun to seek new commercial fishing vessels less than 50 feet in length.

Classification Can Contribute Safety Benefits, but Other Factors and Measures Also Play a Significant Role

Federal agency officials tasked with overseeing the commercial fishing industry, as well as industry representatives, academics, builders, and owners we interviewed, agreed that classing provides some benefits and could contribute to overall vessel safety by providing independent and ongoing oversight to ensure quality and seaworthiness during the design and construction of the vessel, as well as through annual maintenance surveys. At the same time, however, vessel owners we interviewed noted that overall vessel safety can also be improved by instituting other safety measures or design approaches. As shown in figure 6, classification addresses vessel design, construction, and maintenance, but training, safety and lifesaving equipment, environmental, and other factors also contribute to commercial fishing vessel safety.

Figure 6: Characteristics and Key Stakeholders Involved with Commercial Fishing Vessel Safety



Source: GAO analysis of National Academy of Sciences data. | GAO-18-16

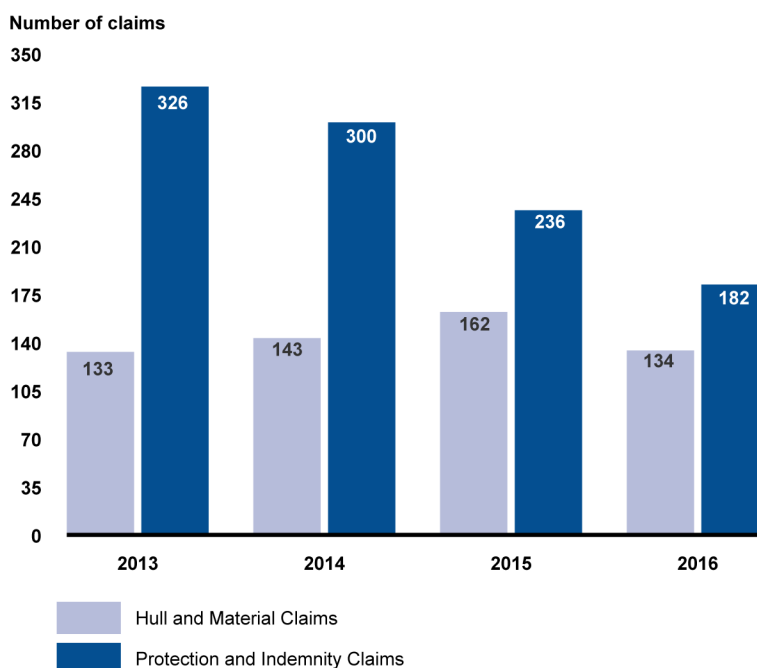
As one industry trade representative explained, classing commercial fishing vessels is another approach for improving industry safety by ensuring key systems aboard the vessel are in good, working order, thereby potentially breaking the chain of events leading to a major catastrophe at sea, such as a vessel sinking. According to a representative for a larger commercial fishing company, vessel owners benefit from the oversight provided by classification society surveyors

during the construction process. Classification society surveyors provide another set of eyes and the perspective of a third party. An owner of a large commercial fishing business stated that vessel owners who do not maintain their classed vessels, and thereby jeopardize the lives of their crew, risk losing their vessel's classification certificate, which, in turn, will prevent them from operating the vessel legally.

Overall, commercial fishing industry representatives supported the requirement that commercial fishing vessels with factory processors onboard be classed because of the risks these vessel owners face with such a large number of factory workers—who are not mariners—working onboard. Most vessel owners that we interviewed or received written documentation from, however, did not support classification for smaller commercial fishing vessels—especially those operated by individual owners with small crews.

To illustrate that different factors contribute to commercial fishing vessel safety, we collected data on fishing vessel accident claims from two U.S.-based marine insurance underwriters that insure commercial fishing vessels. While our findings are not generalizable to all insurance claims made between 2013 and 2016, we found that protection and indemnity claims, which cover liability for bodily injury and third-party damage—accounted for nearly two-thirds of insurance claims for these two underwriting companies. Hull and material claims also comprised a significant number of overall insurance claims over the period. These claims can be made as a result of physical loss of or damage to the vessel, including equipment, engines, and machinery. Figure 7 shows the number and types of claims for 2013 through 2016 from two marine underwriting companies we interviewed.

Figure 7: Commercial Fishing Vessel Insurance Claims Data from Two Marine Underwriting Companies, 2013-2016



Source: 2013-2016 commercial fishing vessel insurance claims from two marine underwriters. | GAO-18-16.

One vessel owner we interviewed stressed the importance of safety training so crew members are capable of using lifesaving equipment when it is needed. She referred us to a Coast Guard analysis of fishing vessel casualties occurring from 1992 to 2010 that found fatalities from water exposure might have been prevented if personal floatation devices or survival suits had been used. In its analysis, the Coast Guard found that 32 percent of all fatalities between 1992 and 2010 resulted from crew falling overboard, being pulled overboard by equipment, or diving from the vessel.³⁰

Other vessel owners who operate in the Gulf of Mexico stressed several safety measures, such as:

- requiring vessel crew members to undergo routine drug testing;

³⁰United States Coast Guard, Office of Investigations and Analysis, *Analysis of Fishing Vessel Casualties: A Review of Lost Fishing Vessels and Crew Fatalities, 1992-2010* (Washington, D.C.: December 2011).

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- requiring vessel crew members to wear personal floatation devices when working on deck;
 - requiring all commercial fishing vessels that use a winch to hoist catch from the ocean to install either a guard or emergency shut-off mechanism; and
 - mandating skills-based training and testing of safety procedures for each vessel crewmember, not just the individual in charge of the vessel, as the law currently requires.³¹

Commercial fishing industry representatives and vessel owners we interviewed also stated that stability assessments and load line assignments—which are required for fishing vessels built after July 1, 2013, that are 79 feet or longer—may provide safety benefits comparable to classification. A load line indicates the point where the waterline should reach when a vessel is properly loaded. As part of a load-line certification, a vessel's seaworthiness is assessed, which involves the completion of stability documentation, providing the operator with instructions for safely loading and operating the vessel. Load line requirements cover some of the same items as classification rules, such as pre-construction review and approval of plans by the assigning authority, weathertight and watertight integrity, and periodic inspections to verify proper maintenance and ensure that modifications to the vessel do not compromise seaworthiness.

³¹A representative for the Coast Guard's Commercial Fishing Vessel Safety Program for the state of California emphasized the importance of skills-based training, noting that since 2001, when the state's commercial fishing vessel fleets began voluntarily electing at least one crewmember to complete the Coast Guard's safety drill conductor curriculum, commercial fishing crew fatalities and vessel losses have dropped by 50 percent.

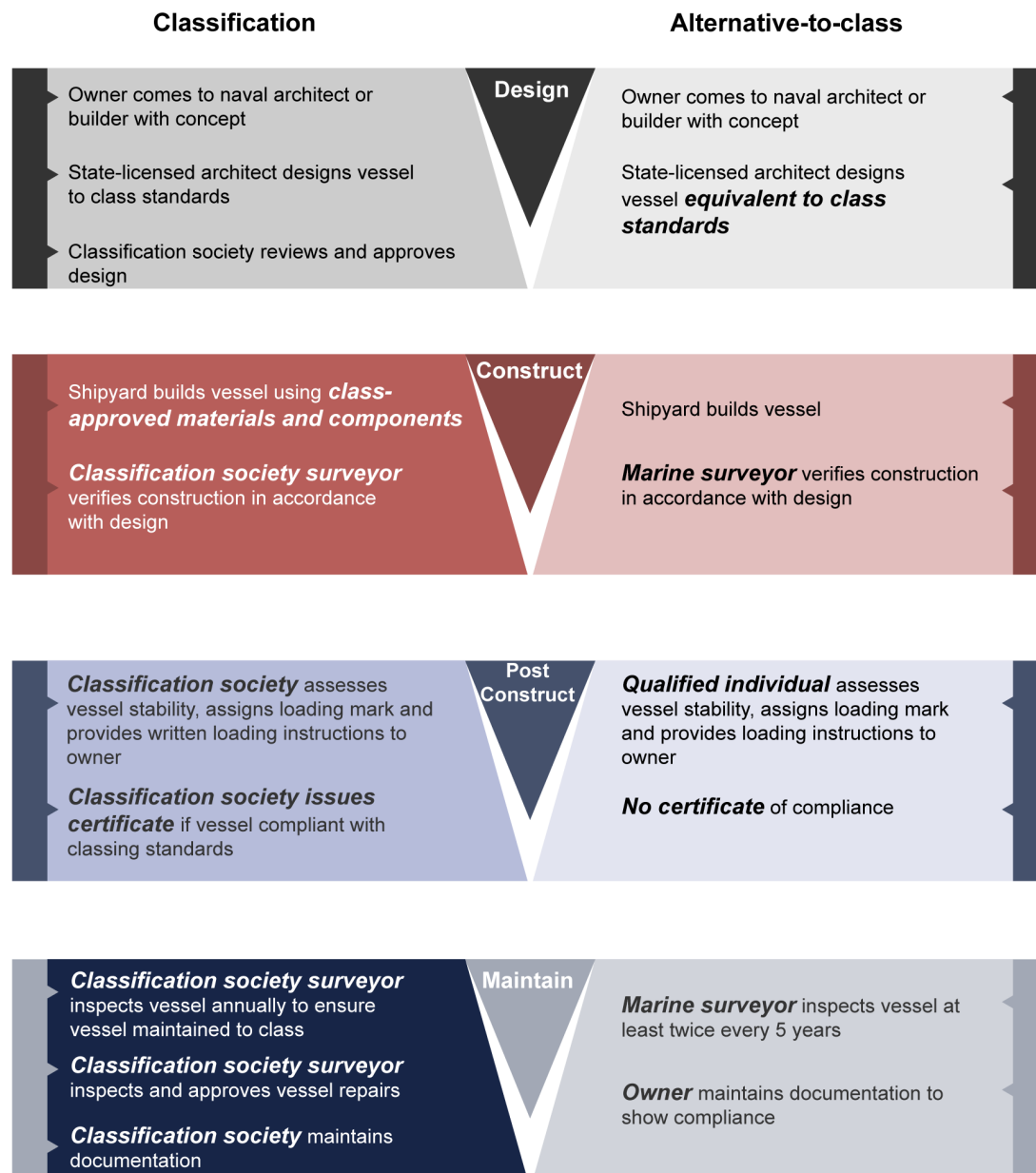
Alternative-to-Class Approach Offers Benefits Relative to Classification, but Key Elements Remain Open to Interpretation

The alternative-to-class approach provides some flexibility and potential cost savings to vessel owners compared to classification, but we did not identify a builder who has constructed a vessel using this approach. The Coast Guard has not issued regulations or guidance to clarify how the alternative-to-class approach will be implemented, which increases uncertainty on how key steps in the process should be conducted.

The Coast Guard Authorization Act of 2015 created an alternative-to-class approach for vessels at least 50 feet and not more than 79 feet in length built after February 8, 2016.³² Under the alternative-to-class approach, a commercial fishing vessel is designed to standards equivalent to classification society standards. For example, the alternative-to-class approach requires a stability assessment and an assigned loading mark (or load line) certification that construction is in accordance with design, and written stability and loading instructions that are provided to the owner or operator to ensure a robust hull and weathertight and watertight integrity. As such, the structural strength of the vessel's hull, reliability and function of major systems—including propulsion and steering—and watertight integrity of the vessel are expected to be comparable to a classed vessel. However, the alternative-to-class approach provides some flexibility to builders and owners in how to do so, as shown in figure 8.

³²Pub. L. No. 114-120, § 318 (codified at 46 U.S.C. § 4503(e)).

Figure 8: Comparison of Selected Elements of Classification and the Alternative-to-Class Approach



Source: GAO analysis of Classification society rules and 46 U.S.C. § 4503(e). | GAO-18-16.

The alternative-to-class approach provides additional flexibilities to builders and owners and potentially reduces compliance costs compared

to classing a new vessel. Examples of the flexibilities and potential drawbacks the alternative-to-class approach offers include the following.

- It enables a marine surveyor of an organization accepted by the Secretary of Homeland Security, rather than a classification society representative, to verify that the vessel's construction meets design requirements and to conduct inspections. Coast Guard officials told us that such individuals need to be licensed by an organization, such as the Society of Accredited Marine Surveyors or the National Association of Marine Surveyors, to be deemed qualified by the Coast Guard.
- It reduces inspection requirement from annually to at least twice every 5 years, and according to Coast Guard officials, the alternative-to-class approach does not impose requirements for disassembly and inspection of propulsion machinery, generators, electrical systems, pumps, and piping.
- It requires owners to maintain records to demonstrate compliance with the alternative-to-class approach, which may be burdensome for some vessel owners.

However, our interviews with commercial fishing stakeholders and our analysis raised several questions as to how certain aspects of the alternative-to-class approach will be implemented. For example, stakeholders raised a number of questions about state licensing requirements for naval engineers and architects, including whether licenses issued in one state would be recognized by other states. One naval engineer in the North Pacific told us that he had to secure an engineering license to do work for a client in another state, despite holding the same license in his home state. Coast Guard officials did not believe that differences in state licensing requirements should be an issue. Coast Guard officials explained that although each state may have different licensing requirements, one professional society sets the technical standards for professional engineers and that these common standards apply across all states. Despite this, it is not certain if individual states will recognize other states' engineering licenses. Table 3 highlights our analysis of the key issues raised by industry stakeholders during the course of our review.

Table 3: Alternative-to-Class Requirements from 46 U.S.C. § 4503 subsection (e) and Open Implementation Questions

Phase	Alternative-to-Class requirement	Open implementation questions
Design	(1) The vessel is designed by a state-licensed naval architect or marine engineer, and the design incorporates standards equivalent to classification society standards or another qualified organization approved by the Secretary of the Department of Homeland Security.	How will differences in states' licensing requirements be addressed? Who will determine that design standards are equivalent to classification society standards?
Construction	(2) Vessel construction is overseen and certified as being in accordance with its design by a marine surveyor of an organization approved by the Secretary of the Department of Homeland Security.	What organizations are approved and to whom are they accountable?
	(3) the vessel— (A) completes a stability assessment performed by a qualified individual; (B) has written stability and loading instructions that are provided to the owner or operator; and (C) has an assigned loading mark.	Who is qualified to perform stability assessments? Will stability assessments and loading mark requirements be consistent with those previously established for vessels over 79 feet in length?
	(4) The vessel is not substantially altered without the review and approval of state-licensed naval architect or marine engineer prior to start of substantial alteration.	How will differences in state licensing requirements be addressed?
Maintenance	(5) The vessel undergoes a condition survey at least twice in 5 years, not to exceed 3 years between surveys, to the satisfaction of a marine surveyor of an organization accepted by the Secretary of the Department of Homeland Security.	What activities should the vessel condition survey entail? What organizations are acceptable?
	(6) The vessel undergoes an out-of-water survey at least once every 5 years to the satisfaction of a marine surveyor of an organization accepted by the Secretary of the Department of Homeland Security.	What activities should the out-of-water survey entail? What organizations are acceptable?
	(7) Once every 5 years and at the time of a substantial alteration to such vessel, compliance of the vessel with the requirements of paragraph (3) is reviewed and updated as necessary.	Who is qualified to perform stability assessments?
	(8) For the life of the vessel, the owner of the vessel maintains records to demonstrate compliance with this subsection and makes such records readily available for inspection to enforce this chapter.	What documents are considered adequate to demonstrate compliance? Which organization will verify and enforce the alternative-to-class approach?

Source: 46 U.S.C. §4503(e) and GAO analysis. | GAO-18-16

Although Coast Guard officials believe that the legislation clearly outlined the requirements for this approach, numerous open questions exist regarding implementation of the alternative-to-class approach, as depicted in table 3. The Coast Guard has not yet issued regulations or guidance concerning the alternative-to-class approach. Coast Guard officials noted they are still in the process of developing a final rule to implement earlier legislation, including the Coast Guard Authorization Act of 2010, as amended by the Coast Guard and Maritime Transportation Act of 2012. At the time of our review, Coast Guard officials acknowledged they were uncertain when this rule would be finalized. These officials stated that any effort to promulgate rules for the 2016 alternative-to-class approach will not start until after the final rule

regarding the 2010 and 2012 acts is issued. However, Coast Guard officials noted they were considering developing a policy letter to provide some additional guidance on implementing the alternative-to-class approach, but provided no timeframe for doing so.

The Coast Guard is responsible for implementing the alternative-to-class statute, but questions remain regarding how this implementation will be achieved. While the 2016 legislation did not require the Coast Guard to promulgate guidance or regulations for the alternative-to-class approach, regulations are one of the primary tools federal agencies use to implement law and policy. The general process by which federal agencies develop and issue regulations allows the public an opportunity to provide information to agencies on the potential effects of a rule or to suggest alternatives for agencies to consider prior to publication of the final rule.³³ Federal internal control standards recommend that agency management communicate with both internal and external stakeholders the necessary quality information, such as regulations describing procedures to be followed to comply with the alternative-to-class legislation, to achieve objectives.³⁴ Without specific written procedures—either in the form of regulations or guidance—the Coast Guard cannot ensure consistent implementation of the alternative-to-class approach.

Conclusions

Since the late 1980s, Congress had undertaken efforts to improve commercial fishing vessel safety, including establishing classification requirements for all three types of commercial fishing vessels—catchers, tenders, and processors—and, most recently, establishing an alternative-to-class approach as a less-prescriptive option for smaller vessels. Accurate data collected by the Coast Guard during incident investigations—such as the fishery in which the vessels operate—is necessary to understand which fishing vessels are involved in accidents. In addition, reliable data on the total number of commercial fishing vessels that are actively fishing and information on key vessel characteristics—including vessel age, length, and its fishery—is necessary to calculate rates and establish trend information for commercial fishing vessels involved in accidents. Without such information, Congress, the Coast Guard, and other federal agencies—

³³5 U.S.C. § 553.

³⁴GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014).

such as NIOSH—will not be able to assess the factors that contribute to commercial fishing vessel accidents, injuries, and fatalities.

While the costs of classification cannot be reliably measured, industry stakeholders perceive the potential costs associated with classing—regardless of what the actual costs are—as impacting the commercial fishing industry, including reduced orders for new vessels, and the continued operation of aging vessels, and the loss of income for commercial fishers. The alternative-to-class approach provides greater flexibility and potential cost savings to owners of smaller commercial fishing vessels. While not required to do so, the Coast Guard has not issued guidance or promulgated regulations to clarify aspects of the alternative-to-class approach. However, the absence of timely regulations or guidance has contributed to confusion among the commercial fishing industry and increases the risk of potentially inconsistent implementation of the alternative-to-class approach.

Recommendations for Executive Action

We are making a total of six recommendations, including four to the Commandant of the Coast Guard, one to the Director of NIOSH, and one to the Assistant Administrator for Fisheries for the National Marine Fisheries Service:

- The Coast Guard should ensure that the data it collects during commercial fishing vessel incident investigations, including the fishery in which the commercial fishing vessel is involved, is accurately captured. (Recommendation 1)
- The Coast Guard should form a working group with NIOSH and the National Marine Fisheries Service to determine an efficient means to establish a reliable estimate of the population of commercial fishing vessels actively fishing, landing, and selling their catch; the fishery in which a vessel operates; and key vessel characteristics including, but not limited to, vessel age and length. (Recommendation 2)
- Once reliable data are available, the Coast Guard, or another agency identified by the working group, should assess the rates of commercial fishing vessel accidents, injuries, and fatalities to determine whether certain factors—including vessel length and region of operation, among other things—affect these rates. (Recommendation 3)
- The Coast Guard should issue regulations or guidance to clarify and implement the alternative-to-class approach. (Recommendation 4)

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- NIOSH should form a working group with the Coast Guard and the National Marine Fisheries Service to determine an efficient means to establish a reliable estimate of the population of commercial fishing vessels actively fishing, landing, and selling their catch; the fishery in which a vessel operates; and key vessel characteristics including, but not limited to, vessel age and length. (Recommendation 5)
 - The National Marine Fisheries Service should form a working group with the Coast Guard and NIOSH to determine an efficient means to establish a reliable estimate of the population of commercial fishing vessels actively fishing, landing, and selling their catch; the fishery in which a vessel operates; and key vessel characteristics including, but not limited to, vessel age and length. (Recommendation 6)

Agency Comments and Our Response

We provided a draft of this product to the Departments of Homeland Security; Health and Human Services; and Commerce to respond on behalf of the Coast Guard, NIOSH, and NOAA, respectively for review and comment. The Departments of Health and Human Services and Commerce concurred with the recommendation directed to their components. The Department of Homeland Security concurred with three of the four recommendations. The departments' written comments are reprinted in appendixes III-V, respectively, and summarized below. We also sent a draft of this product to NTSB for their review and comment. The departments and NTSB also provided technical comments, which we incorporated as appropriate.

The Department of Homeland Security concurred with our recommendation to ensure that the data the Coast Guard collects during commercial fishing incident investigations, including the fishery in which the vessel is involved, is accurately captured. It noted that the Coast Guard will reemphasize the need to collect fishery data as part of its training programs and qualification requirements of its investigators. Additionally, it stated that the Coast Guard will consider adding additional data fields within its Marine Information for Safety and Law Enforcement database to improve the accuracy of the data collected.

The Departments of Homeland Security, Health and Human Services, and Commerce concurred with our recommendations directed to them to form a working group to establish a reliable estimate of the population of commercial fishing vessels, the fishery in which the vessel operates, and key vessel characteristics. The Department of Homeland Security noted that neither the Coast Guard nor the National Marine Fisheries Service have access to data for fisheries within economic zones managed by the

states. As such, the Department of Homeland Security recommended that the (1) working group be established at the regional level and (2) regional fisheries management councils coordinate with individual states to collect needed data and, in turn, provide that data to the Coast Guard and the National Marine Fisheries Service. Additionally, the Department of Health and Human Services stated that NIOSH will assist in identifying ways to establish comprehensive vessel counts, which could include engaging state agencies.

The agencies' comments reflect the complexity of and need to capture reliable data of the size and characteristics of the commercial fishing vessel fleet. Determining the working group's membership, structure, roles and responsibilities is an essential first step to doing so. Regardless of the working group's structure, it will be important to ensure that the data collected is done in a manner that allows it to be aggregated and analyzed in various ways, including at the national level.

The Department of Homeland Security did not concur with our recommendation that the Coast Guard assess the rates of commercial fishing vessel accidents, injuries, and fatalities to determine whether certain factors—such as vessel length and region of operation—affect these rates. The Coast Guard stated that it had limited resources and capabilities to conduct such assessments and noted that NIOSH studies marine incidents to identify causal factors in fishing vessel casualties, which could more effectively determine casualty rates.

We agree that NIOSH has, and can, play an important role in identifying commercial fishing fatalities and regional risk factors, but such assessments typically focus on fatalities in specific fisheries, and generally did not consider such factors as vessel length or whether the vessel has been classed. Further, the Coast Guard is the agency responsible for developing and enforcing regulations related to commercial fishing vessel safety, including classification requirements and the alternative-to-class approach. As such, the Coast Guard's office of Investigations and Casualty Analysis leads the agency's investigation program to promote safety, protect the environment, and prevent future accidents. As part of its efforts, this office has previously analyzed data on commercial fishing vessel accidents. While we continue to believe that our recommendation is appropriately targeted to the Coast Guard, we acknowledge that the working group could determine that another appropriate agency other than the Coast Guard is better positioned to conduct this analysis. As such, we have revised our recommendation to

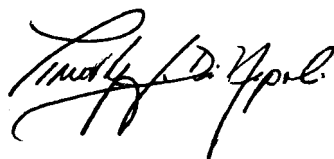
provide more flexibility to the agencies in determining how best to meet the intent of our recommendation.

The Department of Homeland Security concurred with our recommendation that the Coast Guard issue regulations or guidance to clarify and implement the alternative-to-class approach. It noted that the Coast Guard is in the process of developing a more formal policy on best practices and expectations of the industry and implementing guidelines consistent with the intent of the legislation, which it hopes to complete by December 31, 2018.

We also provided a draft of this report to the three classification societies we included in our review—ABS, DNV GL, and RINA—for their review and comment. ABS and DNV GL provided technical comments, which we incorporated as appropriate.

We are sending copies of the report to the appropriate congressional committees. We are also sending a copy to the Secretary of Homeland Security, the Secretary of Health and Human Services, the Chairman of the National Transportation Safety Board, the Secretary of Commerce, and other interested parties. In addition, this report is available at no charge on the GAO website at <http://www.gao.gov>.

Should you or your staff have questions, please contact me at (202) 512-4841 or dinapolit@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 VI.



Timothy J. DiNapoli
Director, Acquisition and Sourcing Management

Appendix I: Selected Countries Have Varying Requirements for Classing Commercial Fishing Vessels

Other selected countries that, like the United States, are members of the Organization for Economic Cooperation and Development and have sizeable commercial fishing industries have established requirements for designing, constructing, and—in some instances—maintaining commercial fishing vessels to classification society standards, as described in table 4.

Table 4: Classification Requirements in the United States and Other Selected Countries

Country	Classification requirements
United States	<ul style="list-style-type: none"> Fish processing vessels built or subject to major conversion after July 27, 1990, must meet all survey and classification requirements established by the American Bureau of Shipping or another classification society recognized by the Coast Guard, and carry proof of compliance onboard the vessel. Commercial fishing vessels <u>less than 50 feet in overall length</u> built after January 1, 2010, are required to be constructed in a manner that provides a level of safety equivalent to the minimum standards established for recreational vessels.^a Catcher and tender commercial fishing vessels that are <u>50 feet or more in overall length</u> and built after July 1, 2013, must meet all survey and classification requirements established by the American Bureau of Shipping or another classification society recognized by the Coast Guard, and carry proof of compliance onboard the vessel. Catcher and tender vessels that are at least 50 and not more than 79 feet in length, built after February 8, 2016, can use the alternative-to-class approach in lieu of classification.
Canada	<p>According to an official from Transport Canada:</p> <ul style="list-style-type: none"> Commercial fishing vessels <u>24.4m (approximately 79 feet) or less in length</u> are not required to be designed, constructed, or maintained in compliance with the requirements of a classification society and are not subject to Canada’s Delegated Statutory Inspection Program, which requires inspection by a government-recognized classification society to determine a vessel’s compliance with rules issued by the government of Canada. Commercial fishing vessels of <u>24m (approximately 78 feet) or more in length</u> are subject to inspection under Canada’s Delegated Statutory Inspection Program. Transport Canada actively promotes that all new vessels be designed and built under classification society rules.
Denmark	<p>According to an official from the Danish Ministry of Industry, Business and Financial Affairs:</p> <ul style="list-style-type: none"> Commercial fishing vessels <u>less than 15m (approximately 49 feet) in length</u>, are required to be designed, constructed and maintained in compliance with the requirements of a Danish Technical regulation. If national standards have not been laid down in a certain area, then commercial fishing vessels shall be designed, constructed and maintained in accordance with the rules of an approved classification society. Commercial fishing vessels <u>15m (approximately 49 feet) or more in length</u>, are required to be designed, constructed, and maintained in compliance with the requirements of a Danish Technical regulation. If national standards have not been laid down in a certain area, then commercial fishing vessels shall be designed, constructed and maintained in accordance with the rules of an approved classification society.^b
Spain	<p>According to an official from the Embassy of Spain in London:</p> <ul style="list-style-type: none"> Commercial fishing vessels <u>less than 24m in length (approximately 78 feet)</u>, are required to comply with standards set by the government of Spain for design, construction, and maintenance. If owners of such a vessel submit scantlings—a set of standard dimensions for a vessel’s structural components—which comply with the design rules of a classification society or standards of similar rigor, the government of Spain will accept the design as compliant with design rules issued by the government of Spain.^b

**Appendix I: Selected Countries Have Varying
Requirements for Classing Commercial
Fishing Vessels**

Country	Classification requirements
United Kingdom	<p data-bbox="289 464 1097 487">According to an official from the United Kingdom's Department for Transport:</p> <p data-bbox="289 499 456 522"><u>Current System</u></p> <ul style="list-style-type: none"> <li data-bbox="289 533 1511 688">• New commercial fishing vessels less than <u>15m in length (approximately 49 feet)</u>, are required to be constructed and outfitted in compliance with the latest standards issued by Seafish or a classification society.^c Commercial fishing vessels less than 7m in length (approximately 23 feet) are required to meet government outfitting standards. An official from the United Kingdom's Maritime and Coastguard Agency stated that these standards do not include all items captured by classing, but will include items other than those generally addressed by classing. <li data-bbox="289 699 1500 751">• Commercial fishing vessels from 15m to less than <u>24m in length (approximately 49-78 feet)</u>, are required to be classed—designed and constructed in compliance with the requirements of Seafish or a classification society. <li data-bbox="289 762 1422 814">• Commercial fishing vessels <u>24m or more in length (approximately 78 feet)</u> are required to be classed—designed, constructed, and maintained in compliance with the requirements of a classification society.^b <p data-bbox="289 825 472 848"><u>Pending System^d</u></p> <ul style="list-style-type: none"> <li data-bbox="289 858 1503 911">• Although there are additional carriage requirements for safety equipment on commercial fishing vessels of <u>less than 15m (approximately 49 feet)</u>, the system for construction and outfitting remains unchanged. <li data-bbox="289 921 1487 974">• There is no change in requirements between the current and pending systems for commercial fishing vessels from 15m to less than <u>24m in length (approximately 49-78 feet)</u>. <li data-bbox="289 984 1487 1037">• There is no change in requirements between the current and pending systems for commercial fishing vessels <u>24m or more in length (approximately 78 feet)</u>.

Source: Senior Marine Safety Inspector, Flag State Compliance and Enforcement, Transport Canada; Ship Surveyor, Ship Certification and Manning, Danish Maritime Authority, Danish Ministry of Industry, Business and Financial Affairs; Maritime Affairs Attaché, Embassy of Spain in London; and the Head of Fishing and Code Safety, Vessel Policy Branch, United Kingdom's Maritime and Coastguard Authority, and Executive Agency of the United Kingdom's Department for Transport. I GAO-18-16.

^aAs set-out in 46 U.S.C. § 4302.

^bDenmark, Spain, and the United Kingdom and other member states of the European Union are subject to Council of European Union Directive 97/70/EC, requiring member states to incorporate into their domestic laws the 1977 Torremolinos Convention's requirements to class commercial fishing vessels 24m or more in length.

^cUnlike the other organizations to which the United Kingdom's Maritime and Coastguard Agency delegates its certifying authority for commercial fishing vessels' hull and machinery construction, Seafish is not a classification society, but rather a non-departmental public body established under the United Kingdom's law.

^dThe United Kingdom's Maritime and Coastguard Agency indicated that during calendar year 2017, the United Kingdom will adopt a new regulatory framework for commercial fishing vessel safety.

Appendix II: Objectives, Scope, and Methodology

This report evaluates the costs and benefits of classing commercial fishing vessels. Specifically, we assessed (1) what is known about the numbers and rates of commercial fishing vessel accidents, injuries, and fatalities; (2) what is known about the costs to construct and maintain classed commercial fishing vessels built since July 2013 and the effects of classing on vessel builders and owners; (3) the benefits associated with classing commercial fishing vessels; and (4) how the alternative-to-class approach compares with building and maintaining commercial fishing vessels to classification society standards.

To assess what is known about the numbers of commercial fishing vessel accidents, injuries, and fatalities, we collected and analyzed data from the Coast Guard's Marine Information for Safety and Law Enforcement database on commercial fishing vessel investigations for calendar years 2006 through 2015 to identify the number of vessel accidents and/or injuries or fatalities. We also collected relevant Coast Guard data on enforcement actions and boardings.¹ To assess the reliability of the data, we reviewed related documentation, spoke with knowledgeable agency officials, and performed electronic testing for obvious errors in accuracy and completeness. Using latitudinal and longitudinal information collected during the Coast Guard's investigation of each commercial fishing vessel accident, we determined where the accident occurred and limited our analysis to those accidents that involved U.S. vessels and occurred between 3 nautical miles and 200 nautical miles from shore, an area that is generally referred to as U.S. federal waters. In the instances of Texas, Puerto Rico, and the Gulf coast of Florida, we used the area between 9 nautical miles and 200 nautical miles from shore, which is consistent with federal waters for those states.² We found errors in the longitudinal and

¹The Coast Guard has authority to make inquiries, examinations, inspections, searches, seizures, and arrests upon the high seas and waters over which the United States has jurisdiction, for the prevention, detection, and suppression of violations of laws of the United States. For such purposes, Coast Guard officers may, at any time, go aboard any vessel subject to the jurisdiction or to the operation of any law of the United States, address inquiries to those on board, examine the ship's documents and papers, and examine, inspect, and search the vessel, and use all necessary force to compel compliance. 14 U.S.C. § 89(a).

²The mandate provision called for GAO to review accidents involving commercial fishing vessels that operate beyond the 3-nautical mile demarcation line, Pub. L. No. 114-120, § 318(b)(1)(A). For commercial fishing vessel accidents that occurred within 3 nautical miles from shore, we could not distinguish between recreational, state-registered commercial fishing vessels and those vessels that operate in federal waters, because of limitations with Coast Guard data. Therefore, we limited our analysis to commercial fishing vessel accidents that occurred beyond 3 nautical miles.

latitudinal data and could not match commercial fishing vessel accidents to an accurate location for 243 observations; we excluded these observations from our analysis. Overall, we determined that the data were sufficiently reliable for reporting the overall number of accidents, injuries, and fatalities over this time period.

We attempted to separate the data by fishery management council region and interstate marine fisheries commission—regional partners of the National Oceanic and Atmospheric Administration (NOAA) that ensure sustainable fishery management throughout the United States—using the longitudinal and latitudinal boundaries of each region and commission. However, we found that the geographic location in which each accident occurred is not sufficiently reliable for determining the region or fishery in which a commercial fishing vessel operates.³ For example, the geographic location of an accident does not necessarily signify that the commercial fishing vessel was engaged in one of the fisheries managed by the regional council. In addition, according to National Marine Fisheries Service officials, the three interstate commissions work almost entirely on issues pertaining to shared fishery resources within the boundaries of their respective states and generally do not manage fishing activity in federal waters, so we could not reasonably assign an accident in federal waters to a region managed by one of these interstate commissions.

We also collected and analyzed data from the National Institute for Occupational Safety and Health's (NIOSH) Commercial Fishing Incident Database on commercial fishing fatalities for calendar years 2006 through 2015 to identify causes of commercial fishing vessel fatalities over this period. To assess the reliability of the data, we reviewed related documentation, spoke with knowledgeable NIOSH officials, and performed electronic testing for obvious errors in accuracy and completeness. We determined that the data were sufficiently reliable for the purposes of reporting the number of fatalities over time. We also examined reports from the National Transportation Safety Board (NTSB) investigations of commercial fishing vessel accidents for calendar years 2006 through 2015, which include some of the most serious accidents, to describe what NTSB identified as the probable causes of these accidents.

³A fishery is the combination of one or more fish stocks, and fishing for such fish stocks.

To identify rates of commercial fishing vessel accidents over time, we requested data from the Coast Guard on the population of commercial fishing vessels that were actively catching, landing, and selling their catch. We collected Coast Guard data on the number of commercial fishing vessels from 2006 to 2015 with a valid certificate of documentation, which indicates that the vessel is registered with the Coast Guard and is greater than 5 net tons. We also contacted NIOSH and NOAA to discuss the ways, if any, that these agencies have estimated the size of the active commercial fishing vessel fleet for their studies or programs. After contacting the Coast Guard, NIOSH, and NOAA for the purpose of collecting data on the total number of active U.S. commercial fishing vessels, we determined that we could not identify sufficiently reliable data about the size of the active U.S. commercial fishing vessel fleet for 2006 through 2015 for the purposes of our analysis. These data reliability problems precluded us from calculating rates of accidents, injuries, or fatalities over this period.

We interviewed officials from the Coast Guard, NIOSH, and NISTB regarding the investigations and analyses they have conducted on commercial fishing vessel accidents and recommendations they have made to improve safety on board these vessels. We also interviewed officials from NOAA's National Marine Fisheries Service to discuss the roles and responsibilities of the regional fishery management councils and interstate marine fisheries commissions.

To assess what is known about the costs to construct and maintain classed commercial fishing vessels built since July 2013 and the effects of classing on vessel builders and owners, we collected data on the costs associated with constructing and maintaining classed commercial fishing vessels from vessel builders and owners willing to share this information. Specifically, we analyzed (1) classification society design review fees quoted to two vessel builders located in the Gulf of Mexico and Pacific regions and other documentation these builders provided, including a construction bid; (2) another vessel builder's cost estimate for constructing a 90 foot long classed commercial fishing vessel to be used in the Gulf of Mexico shrimp industry; and (3) documentation provided by one vessel owner and another individual with extensive experience in the commercial fishing industry including the cost of various engines and generators—class and non-class certified—that could be installed during the construction process. We compared the quotes for these generators and engines to determine the cost differential between class and non-

class certified equipment.⁴ The findings based on these data are not generalizable, but they do provide insight into the additional costs associated with constructing a classed commercial fishing vessel.

In addition, we conducted interviews and discussion sessions with stakeholders in the commercial fishing industry to obtain the perspectives of vessel owners and/or operators, vessel builders, and commercial fishing organizations. Specifically, we interviewed 13 vessel builders, and 36 vessel owners and/or operators from across the United States, including both those with large and small businesses. We also interviewed representatives from 4 commercial fishing trade organizations that represent fisheries in Alaska and the Bering Sea, the Gulf of Mexico, the Pacific Ocean, and the Mid and North Atlantic Ocean.

To ensure we captured many different perspectives, we held three discussion sessions with stakeholders in the commercial fishing industry, inviting interested parties to attend, including vessel owners and builders; trade organization representatives; and naval architects, at locations across the country, including Garden Grove, California; New Orleans, Louisiana; and Seattle, Washington. In total, 39 individuals involved in the commercial fishing industry attended one or more of these discussion sessions. From the testimonial information we collected through these interviews and discussion sessions, we identified common themes, including the impact of classing on vessel builders and owners. We also interviewed representatives from the three predominant classification societies in the United States—American Bureau of Shipping (ABS), Det Norske Veritas Germanischer Lloyd (DNV GL), and RINA to discuss fees they charge as part of the classification process.⁵ We interviewed three marine underwriters who insure commercial fishing vessels off the coast of the Gulf of Mexico, Pacific Ocean, and the Atlantic Ocean to discuss how classification affects insurance premiums.

⁴The design review, engine, and generator quotes that we collected were those that vessel builders and owners received for classed commercial fishing vessels that they were either considering to construct or to replace equipment for and are not necessarily linked to the six vessels that have been classed since July 2013.

⁵Under authorities in title 46 of the U.S. Code, the Coast Guard has entered into formal agreements with six classification societies that delegate certain statutory survey and certification functions for U.S. flagged vessels. In addition to ABS, DNV GL, and RINA, the Coast Guard has agreements with the following classification societies: Class NK, Lloyd's Register, and Bureau Veritas. We reviewed each society's register of classed vessels, available on its website, and did not find evidence that Class NK, Lloyd's Register, and Bureau Veritas have classed a U.S. commercial fishing vessel.

To assess the benefits associated with classing commercial fishing vessels, we obtained the perspectives of vessel owners and/or operators, vessel builders, and commercial fishing trade organizations, and classification societies during the interviews and discussion sessions described above. The information obtained from interviews and discussion sessions cannot be generalized to all vessel builders, owners, or operators; however, the information provides important insights on the experiences of these groups. We also spoke with representatives from ABS, DNV GL, and RINA, as well as marine safety experts, naval architects, academics who study commercial fishing vessel safety, and marine underwriters in fishing industries off the coast of the Gulf of Mexico, the Pacific Ocean, and the Atlantic Ocean. From these interviews and discussion sessions, we identified common themes.

We also reviewed Coast Guard and NIOSH studies related to improving commercial fishing vessel safety and the benefits each found with respect to classing commercial fishing vessels or improved accident outcomes. We collected data on the number of insurance claims submitted by commercial fishing vessel owners from 2013 through 2016 to two of the three marine underwriting companies we interviewed—who were willing to share this information—to determine the number of hull and machinery claims and the number of protection and indemnity claims that these companies processed over the period. The findings based on these data are not generalizable, but they illustrate the types of insurance claims made by commercial fishing vessel owners.

To evaluate how the alternative-to-class approach compares with building and maintaining commercial fishing vessels to classification society standards, we collected and reviewed relevant statutes, documentation of Coast Guard rulemaking efforts, regulations, policies and guidance, as well as classification society rules and standards. We compared the requirements of the alternative-to-class approach with the steps associated with classification to determine the similarities of both approaches. We interviewed cognizant officials from the Coast Guard to discuss the current policies and regulations in place to address commercial fishing vessels and how an alternative-to-class approach will be implemented. We also interviewed representatives from classification societies—including DNV GL, ABS, and RINA—and commercial fishing vessel owners and operators, naval architects, builders and marine underwriters to discuss both approaches. We also collected information on commercial fishing vessel classification requirements from a non-generalizable sample of comparison countries that, like the United States, are members of the Organization for Economic Cooperation and

Development and have sizeable fishing industries. Specifically, we selected Canada, Denmark, Spain, and the United Kingdom, represented among countries with the largest fishing harvests over 2010-2014, according to country data reported by the United Nations' Food and Agriculture Organization. We collected and reviewed documentation of relevant requirements for the United States and each selected country and discussed the requirements with officials from the selected countries. We present this analysis in appendix I.

We conducted this performance audit from June 2016 to December 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.

Appendix III: Comments from the Department of Homeland Security

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



**Homeland
Security**

November 15, 2017

Timothy J. DiNapoli
Director, Acquisition and Sourcing Management
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Re: Management Response to Draft Report: GAO-18-16, "COMMERICAL FISHING
VESSELS: More Information Needed to Improve Classification Implementation"

Dear Mr. DiNapoli:

Thank you for the opportunity to comment on this draft report. The U.S. Department of Homeland Security (DHS) 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 that GAO recognizes that while search and rescue is one of the Coast Guard's most well-known missions, promoting maritime safety has also always been a top Coast Guard priority. Commercial Fishing is one of the most dangerous occupations in the world. To mitigate the danger, the Coast Guard develops and maintains policy and standards that enhance the safe operation of commercial fishing industry vessels, and in conjunction with other federal agencies, enforces regulations relating to fishing vessel safety. The Coast Guard is committed to continuing these and other Coast Guard Prevention Program activities to save lives and help secure our national security.

The draft report contained four recommendations three which the Department concurs and one nonconcur. Attached find our detailed response to each recommendation.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Jim H. Crumacker".

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

Attachment

**Attachment: Management Response to Recommendations
Contained in GAO-18-16**

GAO recommended that the Commandant of the Coast Guard:

Recommendation 1: Ensure that the data it collects during commercial fishing vessels incident investigations, including the fishery in which the commercial fishing vessel is involved, is accurately captured.

Response: Concur. Pursuant to 46 CFR 4.05-1(a) and 4.05-10(a), Coast Guard Investigating Officers (IOs) have the authority to gather written reports of marine casualties for a wide range of vessel events and occurrences. IOs collect pertinent information during the fact-finding phase of the accident investigation process and apply the data when conducting causal analysis to draw conclusions as to why casualties occurred. IOs are trained to collect fisheries data during the course of a casualty investigation involving a commercial fishing vessel. The Coast Guard's Office of Investigations and Casualty Analysis (CG-INV) will reemphasize this as part of current/future IO training programs, qualification requirements, and refresher courses. In addition, the CG-INV and the Office of Commercial Vessel Compliance (CG-CVC) are seeking to improve the accuracy of data collected regarding the types of fishery engaged in at the time of casualty, by recommending additional data fields within the Coast Guard's Marine Information for Safety and Law Enforcement (MISLE) database. Estimated Completion Date (ECD): September 30, 2019.

Recommendation 2: The Coast Guard, with The National Institute for Occupational Safety and Health (NIOSH), and the National Marine Fisheries Service, form a working group to determine an efficient means to establish a reliable estimate of the population of commercial fishing vessels actively fishing, landing, and selling their catch; the fishery in which a vessel operates, and key vessel characteristics including, but not limited to, vessel age and length.

Response: Concur. There is value in establishing a working group to facilitate information sharing; however, the Coast Guard recommends establishing the working group at the regional level. The Coast Guard and the National Marine Fisheries Service (NMFS) do not have access to information about the full commercial fishing population, as many fisheries within the exclusive economic zone are managed by the states (the northeast lobster fishery is one example). The Coast Guard's CG-CVC recommends the regional fisheries management councils coordinate with the individual states for data collection and share that information with the Coast Guard and NMFS. This possibility will be part of discussions at the next annual meeting of the Commercial Fishing Safety Advisory Committee in June 2018, after which decisions will be made concerning the best path forward. Without state partnerships and collaborations, major data gaps will exist on both the east and gulf coasts. ECD: September 30, 2018.

Recommendation 3: Once reliable data are available, should assess the rates of commercial vessel accidents, injuries, and fatalities to determine whether certain factors-including vessel length and region of operation, among other things-affect these rates.

Response: Non-Concur. The Coast Guard has limited resources and capabilities to conduct such assessments. The National Institute for Occupational Safety and Health (NIOSH); however, has been studying marine incidents to identify causal factors in fishing vessel casualties and from our perspective working with such data could more effectively determine casualty rates. CG-CVC uses this information to update and develop commercial fishing vessel safety standards and policies, as appropriate. We request that GAO consider this recommendation resolved and closed.

Recommendation 4: The Coast Guard should issue regulations or guidance to clarify and implement the alternative-to-class approach.

Response: Concur. CG-CVC is in the process of developing a more formal policy on best practices and expectations of the industry and implementing guidelines consistent with the intent of 46 USC 4503. ECD: December 31, 2018.

Appendix IV: Comments from the Department of Commerce



UNITED STATES DEPARTMENT OF COMMERCE
The Secretary of Commerce
Washington, D.C. 20230

October 26, 2017

Mr. Timothy J. DiNapoli
Director, Acquisition and Sourcing Management
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. DiNapoli:

Thank you for the opportunity to review and comment on the Government Accountability Office's (GAO) draft report entitled *Commercial Fishing Vessels: More Information Needed to Improve Classification Implementation* (GAO-18-16). Enclosed are the National Oceanic and Atmospheric Administration's suggested edits and response to the GAO recommendation in the draft report.

If you have any questions, please contact Michael Platt, Jr., Assistant Secretary for Legislative and Intergovernmental Affairs, at (202) 482-3663.

Sincerely,

A handwritten signature in black ink, appearing to read "Wilbur Ross".

Wilbur Ross

Enclosure

**Department of Commerce
National Oceanic and Atmospheric Administration
Response to the GAO Draft Report Entitled
*Commercial Fishing Vessels: More Information
Needed to Improve Classification Implementation*
(GAO-18-16)**

General Comments

The Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) appreciates the opportunity to review the Government Accountability Office's (GAO) draft report. This report does a good job of examining available data related to commercial fishing vessel incidents. Also, the report's summary of the National Marine Fisheries Service's and Regional Fishery Management Council's responsibility regarding fisheries management is generally well-informed.

NOAA Response to GAO Recommendations

The draft GAO report states, "We are making a total of four recommendations, including one to the Commandant of the Coast Guard, the Director of the National Institute for Occupational Safety and Health (NIOSH), and the Assistant Administrator for the National Marine Fisheries Service, collectively. We are also making three separate recommendations to the Commandment of the Coast Guard."

Recommendation 2: "The Coast Guard, NIOSH, and the National Marine Fisheries Service should form a working group to determine an efficient means to establish a reliable estimate of the population of commercial fishing vessels actively fishing, landing, and selling their catch; the fishery in which a vessel operates and key vessel characteristics including, but not limited to, vessel age and length."

NOAA Response: NOAA agrees with this recommendation and will work with the U.S. Coast Guard and the NIOSH in forming a working group. Additionally, NOAA agrees that it is important to be able to identify the fishery in which a vessel is operating at the time of a safety incident in order to be able to calculate incident rates for a particular fishery.

Appendix V: Comments from the Department of Health and Human Services



DEPARTMENT OF HEALTH & HUMAN SERVICES

OFFICE OF THE SECRETARY

Assistant Secretary for Legislation
Washington, DC 20201

OCT 24 2017

Timothy J. DiNapoli
Director, Acquisition and Sourcing Management
U.S. Government Accountability Office
441 G Street NW
Washington, DC 20548

Dear Mr. DiNapoli:

Attached are comments on the U.S. Government Accountability Office's (GAO) report entitled, "*Commercial Fishing Vessels: More Information Needed to Improve Classification Implementation*" (GAO-18-16).

The Department appreciates the opportunity to review this report prior to publication.

Sincerely,

A handwritten signature in cursive script that reads "Barbara Pisaro Clark".

Barbara Pisaro Clark
Acting Assistant Secretary for Legislation

Attachment

**GENERAL COMMENTS OF THE DEPARTMENT OF HEALTH AND HUMAN
SERVICES ON THE GOVERNMENT ACCOUNTABILITY OFFICE'S DRAFT
REPORT -- COMMERCIAL FISHING VESSELS: MORE INFORMATION NEEDED
TO IMPROVE CLASSIFICATION IMPLEMENTATION (GAO-18-16)**

The U.S. Department of Health and Human Services (HHS) appreciates the opportunity from the Government Accountability Office (GAO) to review and comment on this draft report.

Recommendation

The Coast Guard, National Institute for Occupational Safety and Health (NIOSH), and the National Marine Fisheries Service should form a working group to determine an efficient means to establish a reliable estimate of the population of commercial fishing vessels actively fishing, landing, and selling their catch; the fishery in which a vessel operates and key vessel characteristics including, but not limited to, vessel age and length.

HHS Response

HHS concurs with GAO's recommendation.

- Staff involved in commercial fishing safety research will represent NIOSH in a collaborative working group with the Coast Guard and the National Marine Fisheries Service. Based on prior work in obtaining vessel counts for specific fishing fleets, NIOSH will assist in identifying ways to establish comprehensive vessel counts for the country, which could include engaging state agencies.
- NIOSH has previously worked on a report with NMFS that outlines how fatality rates can be calculated by fishery. The publication can be accessed using the following http://www.nmfs.noaa.gov/sfa/publications/technical-memos/nmfs_osf_tm2.pdf

Appendix VI: GAO Contacts and Staff Acknowledgments

GAO Contact

Timothy J. DiNapoli, 202-512-4841 or dinapolit@gao.gov

Staff Acknowledgments

In addition to the contact above, Diana Moldafsky, Assistant Director; Laura Jezewski; Pedro Almoguera; Deanna Burns; Lorraine Ettaro; Danielle Giese; Laura Greifner; Kristine Hassinger; Ramzi Nemo; LeAnna Parkey; Erin Stockdale; Robin Wilson; and Ellen Wolfe made key contributions to this report.

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