



March 2021

# OFFSHORE OIL AND GAS

## Updated Regulations Needed to Improve Pipeline Oversight and Decommissioning



A Century of Non-Partisan Fact-Based Work

# GAO@100 Highlights

Highlights of [GAO-21-293](#), a report to congressional requesters

## Why GAO Did This Study

The offshore oil and gas industry has installed approximately 40,000 miles of oil and gas pipelines in federal offshore waters since the 1940s. BSEE is responsible for enforcing standards and regulations for oil and gas operations—including the oversight of active pipelines and their decommissioning—to enhance environmental protection and safety. As pipelines age, they are more susceptible to damage from corrosion, mudslides, and seafloor erosion, which can result in leakage of oil and gas into the ocean. Additionally, hurricanes can move pipelines extensive distances, which may damage subsea habitat, impede access to sediment resources, and create navigational and trawling hazards.

GAO was asked to review BSEE's management of offshore oil and gas pipelines. This report examines BSEE's processes for (1) ensuring active pipeline integrity and (2) addressing safety and environmental risks posed by decommissioning. GAO reviewed regulations, procedures, and other documents and data related to BSEE's pipeline management processes. GAO also interviewed BSEE officials and those from other agencies with offshore responsibilities.

## What GAO Recommends

GAO recommends that BSEE take actions to further develop, finalize, and implement updated pipeline regulations to address long-standing limitations regarding its ability to (1) ensure active pipeline integrity and (2) address safety and environmental risks associated with pipeline decommissioning. Interior agreed with this recommendation.

View [GAO-21-293](#). For more information, contact Frank Rusco at (202) 512-3841 or [ruscof@gao.gov](mailto:ruscof@gao.gov).

March 2021

## OFFSHORE OIL AND GAS

### Updated Regulations Needed to Improve Pipeline Oversight and Decommissioning

## What GAO Found

The Department of the Interior's (Interior) Bureau of Safety and Environmental Enforcement (BSEE) does not have a robust oversight process for ensuring the integrity of approximately 8,600 miles of active offshore oil and gas pipelines located on the seafloor of the Gulf of Mexico. Specifically, BSEE does not generally conduct or require any subsea inspections of active pipelines. Instead, the bureau relies on monthly surface observations and pressure sensors to detect leaks. However, officials told us that these methods and technologies are not always reliable for detecting ruptures. In response to a pair of significant oil leaks in 2016 and 2017, BSEE partnered with industry to improve subsea leak detection, but the technologies identified remain relatively new and cannot be retrofitted to a majority of pipelines. According to BSEE, the bureau's regulations are outdated and do not address how pipelines should be inspected, the complexities of deep water pipeline operations, and changes in technological standards. BSEE has long recognized the need to improve its pipeline regulations, and in 2007 issued a proposed rule that cited the need to enhance safety and protect the environment, but this effort stalled. The 2007 proposed rule addressed offshore pipeline integrity, including new requirements regarding pipeline inspection and subsea leak detection technologies. Since 2013, BSEE has noted plans to update its pipeline regulations but has made limited progress in the interim. Without taking actions to develop, finalize, and implement updated regulations to address identified oversight gaps, BSEE will continue to be limited in its ability to ensure the integrity of active pipelines.

BSEE does not have a robust process to address the environmental and safety risks posed by leaving decommissioned pipelines in place on the seafloor due to the cumulative effects of oversight gaps before, during, and after the decommissioning process. First, BSEE does not thoroughly account for such risks during the review of decommissioning applications. This has contributed to BSEE and its predecessors authorizing industry to leave over 97 percent (about 18,000 miles) of all decommissioned pipeline mileage on the Gulf of Mexico seafloor since the 1960s. Generally, pipelines must be removed from the seafloor. BSEE, however, may allow pipelines to be decommissioned-in-place if certain criteria are met. Such a high rate of approval indicates that this is not an exception, however, but rather that decommissioning-in-place has been the norm for decades. Second, BSEE does not ensure that operators meet decommissioning standards, such as cleaning pipelines, because they do not observe any pipeline decommissioning activities, inspect pipelines after their decommissioning, or verify most of the pipeline decommissioning evidence submitted. Third, BSEE does not monitor the condition and location of pipelines following their decommissioning-in-place, which reduces its ability to mitigate any long-term risks, such as pipeline exposure or movement. Additionally, if pipelines decommissioned-in-place are later found to pose risks, there is no funding source for removal. As discussed above, BSEE has made limited progress in updating what it acknowledges are outdated pipeline regulations. Without taking actions to develop, finalize, and implement updated pipeline regulations, BSEE will continue to be limited in its ability to ensure that its pipeline decommissioning process addresses environmental and safety risks.

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# Contents

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Letter		1
	Background	4
	BSEE Does Not Have a Robust Process to Ensure Integrity of Active Pipelines	5
	BSEE Lacks a Robust Process to Address Risks Posed by Decommissioned Pipelines Left on the Seafloor	12
	Conclusions	24
	Recommendation for Executive Action	24
	Agency Comments	24
Appendix I	The Bureau of Safety and Environmental Enforcement's Role in the Financial Assurance Process	26
Appendix II	Comments from the Department of the Interior	27
Appendix III	GAO Contact and Staff Acknowledgments	29
Figures		
	Figure 1: Potential Effects of Currents on Pipeline Leak Identification	7
	Figure 2: Mileage of Decommissioned Pipelines Removed Relative to Those Left in Place	13

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## Abbreviations

BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
Interior	Department of the Interior
NOAA	National Oceanic and Atmospheric Administration
OCS	outer continental shelf

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March 19, 2021

The Honorable Raúl M. Grijalva  
Chairman  
Committee on Natural Resources  
House of Representatives

The Honorable Alan S. Lowenthal  
Chairman  
Subcommittee on Energy and Mineral Resources  
Committee on Natural Resources  
House of Representatives

Pipelines are a key piece of infrastructure used in oil and gas production that connect producing areas to refineries and chemical plants. Since the 1940s, the offshore oil and gas industry has installed approximately 40,000 miles of oil and gas pipelines in federal offshore waters, primarily in the Gulf of Mexico. In 2019, pipelines installed on the outer continental shelf (OCS) transferred approximately 16 percent of all domestic oil production and 4 percent of domestic natural gas production.<sup>1</sup> However, there are growing concerns about the integrity of the nation's aging pipeline infrastructure. As pipelines age, they are more susceptible to damage from corrosion; mudslides; seafloor erosion; and snagging from fishing trawlers, which can result in leakage of oil and gas into the ocean. Additionally, heavy currents during hurricanes can move pipelines extensive distances, which may damage subsea habitats, impede access to sediment resources, and create navigational and trawling hazards. Additionally, many of these concerns extend to pipelines decommissioned-in-place—that is, pipelines left indefinitely on the seafloor following the conclusion of their useful lives.

In response to the 2010 *Deepwater Horizon* incident,<sup>2</sup> the Department of the Interior (Interior) initiated a number of policy reforms intended to

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<sup>1</sup>The OCS refers to the submerged lands outside the territorial jurisdiction of all 50 states but within U.S. jurisdiction and control. The portion of the North American continental edge that is federally designated as the OCS generally extends seaward 3 geographical miles off the coastline to at least 200 nautical miles.

<sup>2</sup>On April 20, 2010, the *Deepwater Horizon* drilling rig exploded in the Gulf of Mexico, resulting in 11 deaths, serious injuries, and the largest marine oil spill in the history of the United States.

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strengthen its oversight of offshore oil and gas production on the OCS. On May 19, 2010, Interior reorganized the Minerals Management Service—the agency responsible for managing oil and gas activities in federal waters—to improve the management, oversight, and accountability of activities on the OCS.<sup>3</sup> As an interim step, Interior restructured the Minerals Management Service into the Bureau of Ocean Energy, Management, Regulation and Enforcement—responsible for offshore oil and gas management—and the Office of Natural Resources Revenue, responsible for revenue collections. On October 1, 2011, Interior completed the reorganization by splitting the Bureau of Ocean Energy, Management, Regulation, and Enforcement into the Bureau of Ocean Energy Management (BOEM), which is responsible for leasing and resource management, and the Bureau of Safety and Environmental Enforcement (BSEE), which is responsible for reviewing drilling permits, inspecting offshore drilling rigs and production platforms, and developing regulations and standards for offshore drilling.<sup>4</sup>

BSEE's mission is to promote safety, protect the environment, and conserve resources offshore through regulatory oversight and enforcement. BSEE regulates offshore oil and gas pipelines from permitting design and installation through decommissioning of all pipelines on the OCS and is responsible for the oversight of active gathering pipelines, which transport oil and gas from production facilities to centralized platforms or pipelines.<sup>5</sup>

You asked us to review BSEE's management of issues related to offshore oil and gas pipelines. This report examines BSEE's processes to (1) ensure the integrity of active offshore oil and gas pipelines and (2) address safety and environmental risks associated with decommissioning pipelines that are no longer in use.

To do this work, we reviewed laws, regulations, directives, procedures, and other documentation related to BSEE's processes for (1) ensuring

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<sup>3</sup>Secretarial Order No. 3299 (May 19, 2010).

<sup>4</sup>For the purposes of this report, "BSEE" includes both the present-day Bureau of Safety and Environmental Enforcement and its predecessor agencies, the Bureau of Ocean Energy, Management, Regulation, and Enforcement and the Minerals Management Service.

<sup>5</sup>BSEE conducts this oversight under the authority of the Outer Continental Shelf Lands Act, codified as amended at 43 U.S.C. §§ 1331-1356b. The Pipeline and Hazardous Materials Safety Administration is responsible for regulating active offshore oil and gas transportation pipelines.

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the integrity of active pipelines and (2) addressing safety and environmental risks associated with the decommissioning of pipelines no longer in use. Specifically, we focused on BSEE's processes (1) for ensuring pipeline integrity through inspection and subsea leak detection and (2) addressing decommissioning through review of applications, ensuring standards are met, and monitoring long-term risks. Additionally, we analyzed bureau documentation—including a proposed rule, budget justifications, and incident reports—that discussed the need to improve these oversight functions as they relate to addressing safety and environmental risks.<sup>6</sup> We then reviewed documentation regarding any actions in response and evaluated the extent to which they addressed known areas for improvement.

For both objectives, we interviewed BSEE officials responsible for various aspects of pipeline oversight to better understand the processes they manage as well as to obtain their perspectives on any related safety and environmental risks. We also interviewed officials from other federal agencies with roles on the OCS to obtain their perspectives on pipeline oversight and related safety and environmental risks, including those representing BOEM, the National Oceanic and Atmospheric Administration (NOAA) and its National Marine Fisheries Service, the Pipeline and Hazardous Materials Safety Administration, the Environmental Protection Agency, and the U.S. Coast Guard. For both objectives, we also collected BSEE data on the offshore oil and gas pipeline network and analyzed them to identify aggregate descriptive characteristics, such as the status, age, length, and water depth of pipeline segments. We discussed with BSEE officials the bureau's methods for collecting and managing these data and determined that they were reliable for the purposes of our report. We also contacted three offshore oil and gas industry trade associations to discuss their perspectives on pipeline integrity and decommissioning practices, but they chose not to participate in our review.

We conducted this performance audit from November 2019 to March 2021 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

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<sup>6</sup>We focused this review on the Gulf of Mexico because nearly 100 percent of the approximately 40,000 miles of pipelines ever installed on the OCS were done so within it.

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that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

BSEE's headquarters is responsible for setting national program policy to meet the bureau's mission. BSEE's three regional offices—the Gulf of Mexico regional office in New Orleans, Louisiana; the Pacific regional office in Camarillo, California; and the Alaska regional office in Anchorage, Alaska—are responsible for executing oversight of oil and gas activities, such as conducting inspections of all facilities on the OCS.

BSEE regulates the three phases of the life cycle of a pipeline: (1) design and installation; (2) operation; and (3) decommissioning, which may include leaving a pipeline in the ocean or removing it.

**Design and installation.** BSEE sets the design requirements for pipelines. For example, it sets standards for internal design pressure, pipeline valves, and anticorrosion coatings. BSEE also sets standards for pipeline installation, including pipeline burial and testing.<sup>7</sup>

**Operation.** BSEE requires pipeline inspections to ensure the integrity of pipelines while they are being used for oil and gas operations. If BSEE detects any immediate threats to safety or the environment, it can order the shut-in of pipelines. BSEE is also able to issue citations—known as notices of noncompliance—for regulatory violations and collect civil penalties if operators do not correct the violations.

**Decommissioning.** BSEE is responsible for overseeing decommissioning, which refers to the process of ending oil and gas operations and returning the lease or pipeline right-of-way to a condition that meets regulatory requirements and may include the pipeline being removed or left in place. Companies seeking to decommission pipelines must submit an application to BSEE. Generally, pipelines must be removed at the end of their useful lives, though BSEE may authorize pipelines to be decommissioned-in-place—that is, left on the seafloor—if doing so does not pose hazards to navigation or commercial fishing

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<sup>7</sup>Pipelines greater than 8-5/8 inches in diameter and installed in water depths of less than 200 feet are generally required to be buried to a depth of at least 3 feet, but the Regional Supervisor may require burial of any pipeline in order to minimize environmental degradation and reduce the likelihood of the pipeline constituting a hazard to trawling or other uses. For the purposes of this report, we consider all subsea pipelines to be on the seafloor.



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operations, interfere with other uses of the OCS, or have adverse environmental effects.<sup>8</sup>

The known safety and environmental risks associated with offshore oil and gas pipelines generally stem from leakage or exposure and movement.

**Leakage.** Oil leaks can be toxic to organisms, including plankton, invertebrates, fish, birds, and sea mammals, causing a wide array of adverse effects, such as reduced growth, disease, impaired reproduction, impaired physiological health, and mortality. Corrosion is the largest cause of pipeline failures, which can result in leaks, in offshore oil and gas pipelines in the Gulf of Mexico Region. These concerns also apply to pipelines decommissioned-in-place, which may contain oil and gas if not cleaned properly.

**Exposure and movement.** Natural events, such as hurricanes, mudslides, geologic activity, and shifting sand shoals, can cause pipelines—both active and decommissioned-in-place—to become exposed or to move. Pipelines that are exposed can be commercial fishing or navigation hazards. Pipelines can move into areas of significant sediment resources, Essential Fish Habitats, and trawling areas, as well as disturb historical artifacts and potentially other oil and gas infrastructure. Pipelines can move relatively long distances when subject to strong currents. For example, a pipeline segment was found about 4,000 feet from its original location after displacement as a result of Hurricane Katrina.

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## BSEE Does Not Have a Robust Process to Ensure Integrity of Active Pipelines

BSEE does not have a robust oversight process to ensure the integrity of approximately 8,600 miles of active offshore oil and gas pipelines in the Gulf of Mexico but has taken some actions to address the risks of subsea leaks going undetected.<sup>9</sup> Specifically, BSEE does not generally conduct or require subsea pipeline inspections, and officials told us that required safety devices—pressure sensors—are not always reliable, especially in deeper water, where most current production occurs. In turn, BSEE has worked with industry to promote the development and implementation of new subsea leak detection technologies, but there are limitations on how widely they can be deployed. BSEE has long recognized the need to

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<sup>8</sup>30 C.F.R. §§250.1010, .1750-1754.

<sup>9</sup>For the purposes of this report, we consider active pipelines to be all pipelines installed that have not been decommissioned, even if they are out of service or operators have proposed their decommissioning.

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update its pipeline regulations to better ensure pipeline integrity through improved inspection and leak detection technologies but has made limited progress in doing so.

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### BSEE Does Not Generally Conduct or Require Subsea Inspection of Active Pipelines

BSEE does not generally conduct or require subsea inspection of active pipelines to detect leaks. Rather, BSEE's pipeline oversight process primarily relies on surface observations and pressure sensor testing, which officials explained are not always reliable in identifying pipeline leaks. BSEE regulations do not identify standards for inspection but rather allow regions to set their own policies. BSEE's Gulf of Mexico Region, which oversees approximately 98 percent of all BSEE-regulated active pipelines (about 8,600 of 8,800 miles), requires operators to conduct monthly inspections of pipeline routes via helicopter, marine vessel, or other means to look for evidence of leaks, such as oil sheens or gas bubbles on the surface of the ocean.<sup>10</sup>

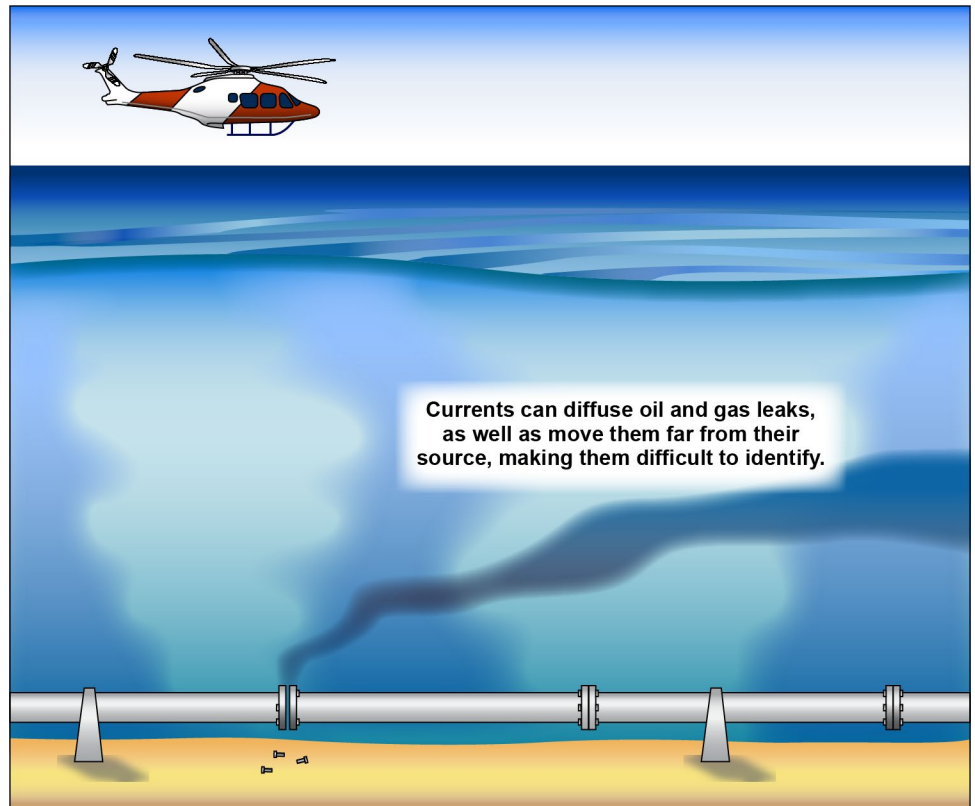
BSEE officials told us that surface observations are not generally reliable indicators of pipeline leakage, especially for leaks that are relatively minor and do not result in vast sheens. In particular, they stated that subsea currents can diffuse leaked oil and gas and move them significant distances from the pipelines from which they leaked, especially in deep water—where the majority of current production occurs—thereby making any observed sheen or bubbles difficult, if not impossible, to associate with a specific pipeline.<sup>11</sup> Therefore, relying on surface observations could allow leaks—particularly slow leaks in deep water that are dispersed by currents—to go undetected for extended periods of time (see fig. 1).

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<sup>10</sup>Conversely, BSEE's Pacific Region requires operators to conduct subsea inspection of active pipelines, which BSEE officials explained is due to a number of factors, including the prevalence of heavy currents, earthquakes, and relative proximity to heavily populated southern California. However, they noted that such inspections—generally completed using remotely operated vehicles—are reasonable in that area, given the limited extent of the pipeline network (approximately 200 miles).

<sup>11</sup>For the purposes of this report, "deep water pipelines" refers to those pipelines installed in water depths of 1,000 feet or greater.

**Figure 1: Potential Effects of Currents on Pipeline Leak Identification**



Source: GAO. | GAO-21-293

Additionally, surface observations do not detect potential movement or exposure of buried pipelines resulting from currents or mudslides. For example, BSEE documentation indicates that in 2005, Hurricane Katrina moved 9 miles of a 22-mile long buried pipeline as far as 4,000 feet out of place. Further, a BSEE-sponsored study suggested that exposure may occur when operators fail to bury pipelines according to regulation and suggested that pipeline burial depth should be periodically verified by inspection.<sup>12</sup> BSEE officials told us that historically the bureau has not systematically tracked whether active pipelines have moved or become exposed and, therefore, the total extent of these phenomena is unknown.

<sup>12</sup>Southwest Research Institute, *Evaluation of Hurricane-Induced Damage to Offshore Pipelines*, a report prepared at the request of the Department of the Interior, Minerals Management Service (March 1995).

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However, BSEE provided information indicating that 49 exposed segments of active pipeline have been discovered since June 2018.

BSEE officials told us that the bureau also inspects pipeline pressure sensors installed on offshore facilities—which are designed to detect if pipeline pressure is anomalously high or low and could therefore signify a pipeline rupture—and added that testing of these devices is part of annual facility inspections. However, BSEE officials explained that they have only recently begun keeping electronic records of tests, so it is not feasible to quantify the frequency with which tests have historically occurred or their results. Additionally, BSEE officials told us that relying solely on these devices in deep water—where a growing majority of production occurs—is not reliable for detecting leaks.

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**BSEE Has Worked with Industry to Develop and Implement Subsea Leak Detection Technologies, but Coverage Is Not Complete, and Technologies Are Relatively New**

In response to a pair of significant pipeline leaks that BSEE believes should have been identified and remediated earlier than they were,<sup>13</sup> the bureau initiated a collaborative project with the Offshore Operators Committee that included a bureau risk assessment of operators and their subsea assets, as well as an industry-led task group focused on improving subsea leak detection.<sup>14</sup> BSEE assessed the risk of subsea leaks of 30 operators based on the volume of potential hydrocarbon release, hydrocarbon type, and age of their subsea infrastructure.<sup>15</sup> Based on this assessment, BSEE met with 19 operators to discuss options for enhancing their subsea leak detection operations. BSEE officials told us that industry has been largely receptive to improving leak detection but noted that the bureau cannot compel industry to take any action to detect leaks that is not described in its regulations.

Additionally, the Offshore Operators Committee formed a task group consisting of three teams—training, advanced monitoring, and future

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<sup>13</sup>These leaks were a May 2016 rupture that resulted in about 2,000 barrels of oil spilled and an October 2017 rupture that resulted in about 16,000 barrels of oil spilled.

<sup>14</sup>The Offshore Operators Committee was formed in 1948 and has evolved into the oil and gas industry's principal representative regarding regulation of offshore exploration, development, and producing operations in the Gulf of Mexico. In 2018, the Offshore Operators Committee revised its focus to all federal OCS regions. In 2019, the Offshore Operators Committee again revised its focus to include all forms of offshore energy development on the OCS, inclusive of renewables.

<sup>15</sup>Risk factors include the size of potential hydrocarbon release, pipeline age, and the type of hydrocarbon, with oil posing more of a health and environmental risk and gas posing more of a safety risk.

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technology—to respond to BSEE’s request to improve subsea leak detection.

**Training.** The training group led efforts to standardize subsea leak detection training to make sure control room operators were considering a potential leak when production anomalies occurred and to understand how the fields they were monitoring would respond in certain conditions, which would allow them to effectively diagnose a possible subsea leak.

**Advanced monitoring.** The advanced monitoring group focused on creating new or improving existing subsea leak detection monitoring techniques. According to a 2019 BSEE report,<sup>16</sup> two techniques, Meter-In/Meter-Out and Conditional Rate of Change, are viewed as the best monitoring techniques, and most operators are either using or planning to use one of them to improve their subsea leak detection.<sup>17</sup> This report also indicated that all operators with infrastructure suited to implement these technologies have done so.<sup>18</sup>

**Future technologies.** The future technologies group focused on assessing new technologies to detect subsea leaks. BSEE documentation indicates that operators identified two potential developing technologies: (1) an active acoustic device that uses sonar to locate and identify leaking hydrocarbons in the sea and (2) an autonomous underwater vehicle equipped with a methane detector that can automatically inspect subsea infrastructure for a subsea leak.

Despite these efforts, BSEE officials told us that subsea leak detection remains an area of concern. Specifically, they explained that the existing technologies, such as Meter-in/Meter-out and Conditional Rate of Change, are still relatively new and that more development is needed before these technologies—or their successors—will represent industry standards. Additionally, even if these technologies became industry

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<sup>16</sup>BSEE, *A New Era of Management: Driving Safety Performance and Environmental Stewardship Improvements Beyond Regulation through Innovation and Collaboration* (July 2019).

<sup>17</sup>Meter-In/Meter-Out is used less since it requires subsea flow meters, which most operators do not have installed. Meter-In/Meter-Out utilizes two flow meters at different ends of a flow line to monitor the flow into the flow line and out of the flow line and compares the two sets of data. If there is an anomaly in the data, an alarm is issued. Most operators use a version of the Conditional Rate of Change algorithm, and some also use Meter-In/Meter-Out on the same system.

<sup>18</sup>BSEE indicated that all pipelines in the Pacific Region are equipped with these leak detection technologies.

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standards, not all existing pipeline infrastructure could be retrofitted to incorporate them, leaving predominantly older pipelines—which are more susceptible to leakage from degradation over time—without any modern monitoring equipment. Furthermore, the advanced age of many active pipelines might also make them more susceptible to a loss of integrity and further underscores BSEE’s need to enhance its inspection requirements. Specifically, over 44 percent (about 3,780 of 8,600 miles) of active pipelines were installed prior to 2000, which, according to BSEE documentation, can increase the risk of leakage incidents due to corrosion. In particular, BSEE documentation cites that smaller operators are adding newer wells to aging pipeline infrastructure, creating high-risk scenarios. As noted previously, BSEE reported that all operators capable of implementing one of these technologies have done so. However, the coverage provided represents about one-third of active pipelines (about 2,900 of 8,600 miles), and BSEE officials told us that existing regulations do not allow the bureau to compel the implementation of these technologies—or their successors—on existing or future pipelines.

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### BSEE Has Made Limited Progress in Updating Regulations to Enhance Its Ability to Ensure Active Pipeline Integrity

BSEE’s mission is to promote safety, protect the environment, and conserve resources offshore through regulatory oversight and enforcement. BSEE has long recognized the need to update its regulations to better ensure the integrity of active pipelines by improving inspection and leak detection standards to reflect the complexities of modern deep water pipeline operation but has made limited progress in doing so. To address what it considers to be outdated regulations that were originally promulgated in 1988, BSEE in 2007 published a proposed rule to update its pipeline regulations that included changes intended to enhance safety and protect the environment.<sup>19</sup> This proposed rule addressed offshore pipeline integrity, including new requirements regarding pipeline inspection and subsea leak detection technologies.<sup>20</sup> However, the effort stalled, and the bureau did not move beyond proposing the new rule. BSEE officials explained this was largely due to the 2010 Deepwater Horizon incident and that subsequent regulatory efforts, such as the Well Control Rule, took precedence.<sup>21</sup>

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<sup>19</sup>Oil and Gas and Sulfur Operations in the Outer Continental Shelf—Pipelines and Pipeline Rights-of-Way, 72 Fed. Reg. 56,442 (Oct. 3, 2007).

<sup>20</sup>The proposed rule included potential requirements for surveys to determine if a pipeline interferes with other uses of the OCS.

<sup>21</sup>Oil and Gas and Sulphur Operations in the Outer Continental Shelf—Blowout Preventer Systems and Well Control Revisions, 84 Fed. Reg. 21,908 (May 15, 2019).

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In its budget justifications for fiscal years 2014, 2015, and 2016, BSEE noted plans to update its pipeline regulations. In a 2017 document advocating to reinstate the effort, a BSEE official responsible for pipeline management cited the benefits to safety and environmental protection of doing so. Further, in a 2019 memorandum to the bureau Director, the same official stated that the existing regulations are technologically behind and do not address the complexities of deep water pipeline integrity—including inspection.<sup>22</sup> Further, the BSEE official cited the benefits of incorporating existing policy and guidance into regulation, thereby making those standards enforceable. BSEE officials we interviewed explained that, because the existing regulations do not mention any aspect of deep water operation, it can be difficult to compel operators to take certain actions, such as inspecting pipelines following hurricanes or retrofitting infrastructure with subsea leak detection technologies.

However, in the nearly 8 years since BSEE reinstated its effort to update its pipeline regulations—and more than 13 years since it published a proposed rule—BSEE has made limited progress in doing so.<sup>23</sup> In December 2019, BSEE documentation indicated that the bureau expected to publish a new proposed rule in the *Federal Register* within the month. However, as of January 2021, BSEE has not done so and identified March 2021 as its target date to have examined the contents of and the issues raised by the bureau’s 2007 published proposed rule. BSEE officials told us that they have been meeting in a working group to discuss potential updates but have not yet addressed pipeline monitoring and inspection, among other issues such as decommissioning, and it is not clear what progress has been made that would make the new target

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<sup>22</sup>Deep water pipelines were not in widespread use when the regulations were developed.

<sup>23</sup>BSEE’s limited progress in updating its pipeline regulations is consistent with its recent difficulties implementing other key internal efforts—including a restructuring of its oversight capabilities, as well as several strategic and management initiatives—on which we have previously reported. These reports were the basis for adding a segment on the restructuring of offshore oil and gas oversight to the Management of Federal Oil and Gas Resources area of our March 2017 High-Risk Series report and expanding it in our March 2019 High-Risk Series report. GAO, *Oil and Gas Management: Interior’s Bureau of Safety and Environmental Enforcement Restructuring Has Not Addressed Long-Standing Oversight Deficiencies*, [GAO-16-245](#) (Washington, D.C.: Feb. 10, 2016); *Oil and Gas Management: Stronger Leadership Commitment Needed at Interior to Improve Offshore Oversight and Internal Management*, [GAO-17-293](#) (Washington, D.C.: Mar. 21, 2017); *High-Risk Series: Progress on Many High-Risk Areas, While Substantial Efforts Needed on Others*, [GAO-17-317](#) (Washington, D.C.: Feb. 15, 2017); and *High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*, [GAO-19-157SP](#) (Washington, D.C.: Mar. 6, 2019).

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date attainable. In particular, they explained that due to the significant differences since the publication of the 2007 proposed rule, this rulemaking has taken additional time to not only review the proposed 2007 rule content, but to revise it based on current technology, practices, and permitting. Without taking actions to further develop, finalize, and implement updated pipeline regulations, BSEE will continue to be limited in its ability to address long-standing limitations in its ability to ensure the integrity of active offshore oil and gas pipelines that increase the safety and environmental risks associated with their operation.

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## BSEE Lacks a Robust Process to Address Risks Posed by Decommissioned Pipelines Left on the Seafloor

BSEE does not have a robust process to address the safety and environmental risks posed by leaving decommissioned pipelines in place on the seafloor due to the cumulative effects of oversight gaps before, during, and after the decommissioning process. First, BSEE does not thoroughly account for safety and environmental risks during its review of applications to decommission, contributing to the bureau authorizing over 97 percent of all pipeline mileage to be left on the seafloor. Second, BSEE does not ensure that operators meet decommissioning standards, such as cleaning and burying pipelines. Third, BSEE does not monitor the condition and location of pipelines following their decommissioning-in-place, which reduces its ability to mitigate any long-term risks, such as pipeline exposure or movement. Additionally, if pipelines decommissioned-in-place are later found to pose risks, there is no funding source for removal. BSEE has long recognized the need to update its pipeline regulations to improve its decommissioning practices but has made limited progress in doing so.

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## BSEE's Review of Decommissioning Applications Results in Nearly All Pipelines Being Left on the Seafloor, Elevating Risks

Since the 1960s, BSEE has authorized industry to leave over 97 percent of pipeline mileage (almost 18,000 miles) on the Gulf of Mexico seafloor following the conclusion of their active use (see fig. 2). Generally, pipelines must be removed from the seafloor.<sup>24</sup> BSEE, however, may allow pipelines to be decommissioned-in-place if doing so does not pose hazards to navigation or commercial fishing operations, interfere with

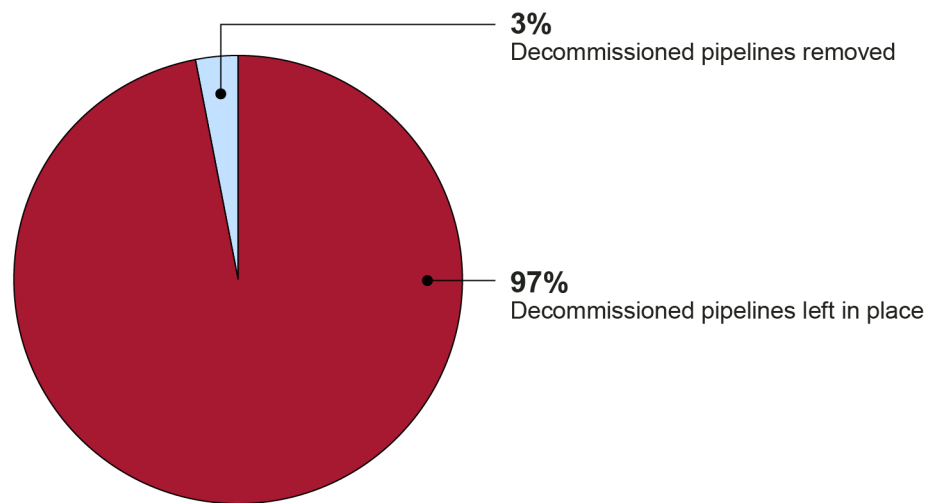
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<sup>24</sup>30 C.F.R. § 250.1010(h). The vast majority of decommissioning has occurred in the Gulf of Mexico Region (over 99 percent). In the Pacific Region, which represents a much smaller portion of offshore oil and gas operations, only three pipeline segments have been decommissioned-in-place.



other uses of the OCS, or have adverse environmental effects.<sup>25</sup> Such a high rate of approval indicates that this is not an exception but rather the norm, however. Widespread decommissioning-in-place is a current practice, as BSEE approved almost 96 percent (777 of 813 segments) of applications to decommission pipelines in place from 2015 through May 2020.<sup>26</sup>

**Figure 2: Mileage of Decommissioned Pipelines Removed Relative to Those Left in Place**



Source: GAO analysis of Bureau of Safety and Environmental Enforcement data. | GAO-21-293

BSEE officials explained that operators apply to decommission pipelines in place as standard practice primarily because it is less expensive and easier relative to pipeline removal. Additionally, some BSEE officials speculated, based on a 2004 BSEE-sponsored study, that decommissioning pipelines in place might, in certain circumstances, pose

<sup>25</sup>30 C.F.R. § 250.1750. Decommissioning means ending oil, gas, or sulphur operations and returning a lease or pipeline right-of-way to a condition that meets the requirements of regulations of BSEE and other agencies that have jurisdiction over decommissioning activities. Among other things, industry is required to decommission all pipelines and clear the seafloor of all obstructions created by lease and pipeline right-of-way operations. 30 C.F.R. §250.1700(a), .1702(f).

<sup>26</sup>Of the 813 applications operators submitted to BSEE to decommission pipeline segments in place between 2015 and May 2020, 777 were approved, 18 were cancelled, and 18 were rejected.

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fewer environmental risks than removal, but this was not a consensus opinion.<sup>27</sup>

However, BSEE's application review does not thoroughly account for safety and environmental risks when assessing decommissioning-in-place applications. Specifically, the bureau does not fully consider whether pipelines constitute hazards to navigation and commercial fishing operations, unduly interfere with other uses of the OCS or have adverse environmental effects, which are the regulatory requirements for authorizing decommissioning-in-place.<sup>28</sup> As a result, BSEE is unable to ensure that pipelines decommissioned-in-place do not pose safety and environmental risks due to pipeline exposure, movement, and corrosion.

**Hazards to navigation and commercial fishing operations.** BSEE officials stated that pipelines decommissioned-in-place do not pose significant navigational hazards, such as obstructing a shipping fairway,<sup>29</sup> at the time of their decommissioning.<sup>30</sup> However, BSEE made no similar statement about commercial fishing hazards, and its application review process does not ensure that decommissioning pipelines in place does not constitute such a hazard because they do not consider commercial fishing during their application review. From 2015 through 2019, 89 trawlers reported damages to their ships or equipment as a result of snagging trawling equipment on oil and gas infrastructure.<sup>31</sup> BSEE and BOEM officials believe most of these snags were from pipelines. As a

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<sup>27</sup>Scandpower Risk Management, Inc., *An Assessment of Safety, Risks and Costs Associated with Subsea Pipeline Disposals*, a report prepared at the request of the Department of Transportation and the Department of the Interior, Minerals Management Service (Sept. 16, 2004).

<sup>28</sup>30 C.F.R. §250.1750.

<sup>29</sup>A shipping fairway is a lane or corridor in which no artificial island or fixed structure, whether temporary or permanent, will be permitted.

<sup>30</sup>According to a BSEE directive, when an operator submits a decommissioning application, BSEE is to verify whether the pipeline crosses a fairway or anchorage area. If the pipeline is found to cross a fairway or anchorage area, United States Army Corps of Engineers approval is required to decommission the pipeline in place.

<sup>31</sup>Fishermen report vessel and fishing equipment damage to NOAA's National Marine Fishery Service's Fisherman's Contingency Fund, which was established to compensate fishermen for economic and property losses caused by oil and gas obstructions on the OCS. Of the 89 claims submitted from 2015 through 2019, 45 were approved and, in total, over \$645,000 in compensation was awarded to fishermen. Twenty-eight claims were rejected and 16 applications were still pending as of May 2020.

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result of these damages, some fisherman were unable to work and reported a loss of income.

**Interference with other uses of the OCS.** BSEE's processes do not ensure that decommissioning pipelines in place does not unduly interfere with other uses of the OCS. Rather, BSEE's application review process only explicitly considers whether certain pipeline valves and fittings, not the whole pipeline, unduly interfere with other uses of the OCS. BSEE's application review directive does provide limited consideration for one use with which pipelines may interfere—areas of significant sediment resources,<sup>32</sup> which are critical resources for coastal restoration. BSEE is to verify whether a pipeline is located in an area of significant sediment resources when an operator submits a decommissioning application for approval and, if it is, BSEE is to contact BOEM for further guidance. BSEE data indicate that location in such an area is the predominant reason for requiring pipeline removal. However, BSEE data also indicate that BSEE has nevertheless allowed a considerable amount of pipelines to be decommissioned-in-place in these areas.

Since the 1970s, BSEE has allowed over 3,600 miles of pipelines (2,447 pipeline segments) to be decommissioned or partially decommissioned in what were, or would later be, designated as areas of significant sediment resources. In January 2009, BOEM issued a Notice-to-Lessees discouraging the future decommissioning-in-place of pipelines in areas of significant sediment resources and noted that it might require previously decommissioned pipelines to be removed to minimize conflict with other uses of the OCS.<sup>33</sup> In October 2016, BOEM sent a memorandum to BSEE to clarify its position in regard to the 2009 Notice-to-Lessees, in which BOEM stated that it considers pipelines decommissioned-in-place in areas of significant sediment resources to unduly interfere with other uses of the OCS and that such pipelines must be decommissioned by removal. Since October 2016, when BOEM began to implement its policy regarding the protection of these areas, BSEE data indicate that it has allowed almost 194 miles (about 100 pipeline segments) to be

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<sup>32</sup>Areas of significant sediment resources contain non-energy marine minerals, particularly sand and gravel. Their minerals are primarily used in coastal restoration projects, including beach nourishment and habitat restoration, which improves coastal resilience to future storms and rising sea levels. BSEE officials told us that designation as an area of significant sediment resources does not mean that an entire lease block contains sediment that may be used for the purposes of restoration but that BOEM would like to review those areas, as they are likely to contain significant sediment resources.

<sup>33</sup>NTL [Notice-to-Lessees] No. 2009-G04.

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decommissioned-in-place or partially decommissioned-in-place in areas of significant sediment resources. According to BSEE officials, the bureau did not allow any pipelines to remain in place without BOEM's concurrence.

BSEE's directive does not outline a process for determining the degree to which such interference should be considered "undue," however. According to BOEM, BSEE allowed some pipelines to be decommissioned-in-place in areas of significant sediment resources due to the presence of wells—which are permanent obstructions to the use of such areas. According to a 2016 BOEM document, half of the reviewed active pipelines (50 of 100) could be decommissioned-in-place, primarily because the areas were also obstructed by wells.<sup>34</sup> BOEM documentation also indicates that 80 percent of known areas of significant sediment resources cannot be used for coastal restoration purposes due to interference by the existing network of all offshore oil and gas infrastructure, including pipelines.

**Adverse environmental effects.** BSEE's process does not ensure that decommissioning pipelines in place does not adversely affect the environment. Specifically, BSEE has not historically directed operators to provide any assessment of the environmental impacts for pipelines proposed to be decommissioned-in-place but conversely does direct operators to submit a brief assessment of the environmental impacts of removal (as well as procedures and mitigation measures that are to be taken to minimize such impacts). BSEE officials told us that BSEE engages with BOEM to determine if decommissioning-in-place requests require a review, such as an environmental assessment. Most BSEE and BOEM officials we spoke to were skeptical that pipelines decommissioned-in-place only have minor environmental effects, especially in the long term, though they acknowledged the issue has not been well studied.<sup>35</sup> Some BSEE officials speculated that pipelines decommissioned-in-place might pose fewer environmental risks than removal because leaving them reduces emissions from service ships

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<sup>34</sup>According to BOEM officials, sediment type, sediment transport dynamics, and construction trends and methodologies may also be considered when determining whether a pipeline could be decommissioned-in-place in an area of significant sediment resources.

<sup>35</sup>According to BOEM officials, they hope to conduct an environmental study on the long-term effects of pipelines decommissioned-in-place in the near future but did not provide a specific time line.

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(because decommissioning-in-place requires less time to complete) and lessens the likelihood of extensive seafloor disturbance, particularly in the short term. They cited a 2004 BSEE-sponsored study that concluded that the environmental risks of decommissioning-in-place are lower than removal because the emissions from ships conducting removal operations outweighed any environmental harm of leaving pipelines on the seafloor.<sup>36</sup> However, this study assumed that pipelines would be properly cleaned,<sup>37</sup> buried, and not subject to movement, but some BSEE and BOEM officials suggested that these steps might not be taken. For example, according to BSEE and BOEM officials, pipelines decommissioned-in-place will eventually corrode and, if not properly cleaned, could release hazardous materials, such as hydrocarbons and chemicals that are toxic to a wide range of organisms.

Under BSEE's regulations, operators may be allowed to forgo certain cleaning procedures when decommissioning pipelines in place. However, the extent to which operators have historically been authorized to do so is unknown because BSEE did not track such authorizations until recently, though recent data suggest BSEE may have authorized applications to do so at a high rate. Since 2019, BSEE approved over 82 percent of applications for alternate compliance procedures (23 of 28) submitted to forgo cleaning pipelines when decommissioning, removing, or taking them out of service temporarily. In some cases, operators said that the pipeline did not allow for the cleaning cited in the regulations.<sup>38</sup> In another instance, a request to forgo cleaning a pipeline was approved because the pipeline was too corroded for the procedure.<sup>39</sup>

BSEE has also authorized decommissioning-in-place for almost 250 umbilical lines—pipeline-related structures that provide electrical and

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<sup>36</sup>Scandpower Risk Management Inc., *An Assessment of Safety, Risks and Costs Associated with Subsea Pipeline Disposals*.

<sup>37</sup>We use the term "cleaning" to refer to pigging and flushing. "Pigging" devices are propelled through the pipeline to clean and remove debris, while "flushing" refers to flushing hydrocarbon products out of the pipeline and then filling with seawater or inhibited seawater. According to BSEE officials, they do not allow departures from flushing requirements.

<sup>38</sup>According to BSEE officials, the most frequent rationale for departing from the cleaning requirements was that it was impractical to pig the pipeline.

<sup>39</sup>BOEM documentation indicates that long-term degradation of pipelines can compromise the structural integrity to the point where removal is not possible, which could result in the contamination of surface mineral deposits.

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hydraulic power to subsea infrastructure—without existing regulations explicitly authorizing doing so or having an understanding of their effects.<sup>40</sup> Some BSEE, BOEM, and Environmental Protection Agency officials we interviewed had concerns about the safety and environmental risks posed by decommissioning umbilicals in place. BOEM officials stated that umbilical lines are of great concern because they often contain hazardous chemicals, and it is not feasible to properly clean them, though BSEE officials stated that they will not authorize decommissioning-in-place for umbilicals that cannot be cleaned. According to BSEE officials, this is pursuant to guidance they received from EPA in 2018. Any hazardous materials may eventually be released into the water as the lines corrode over time—which would be environmentally harmful and would likely constitute an unpermitted pollutant release under the Clean Water Act,<sup>41</sup> according to Environmental Protection Agency officials. BSEE has not recently reviewed the effects of releasing such chemicals into the ocean. BOEM initiated an effort in 2014 to update and expand upon previous work detailing the chemical products used in oil and gas operations—including in umbilical lines—and their associated risks, but terminated the study in 2017 because of a lack of industry groups and chemical suppliers willing to participate.

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### BSEE Does Not Ensure That Operators Meet Decommissioning Standards

BSEE does not ensure that decommissioning activities are conducted in accordance with regulatory standards because the bureau does not observe any pipeline decommissioning activities, inspect pipelines after their decommissioning, or verify most of the pipeline decommissioning evidence submitted.<sup>42</sup> Additionally, in some cases, operators may have abandoned pipelines without notifying the bureau. BSEE is actively tracking and monitoring pipelines as a means of identifying those pipelines that have been decommissioned-in-place without BSEE's

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<sup>40</sup>In 2018, BSEE published a Request for Information in the *Federal Register* regarding the decommissioning-in-place of pipeline-related infrastructure, including umbilicals. Specifically, BSEE wanted to better understand how the decommissioning-in-place of such structures would impact safety and environmental risks, as well as how the structures could interfere with navigation, create obstructions, or otherwise unduly interfere with present or future uses of the OCS. However, BSEE has not taken any subsequent actions to implement a policy based on public feedback.

<sup>41</sup>33 U.S.C. §§ 1251-1387.

<sup>42</sup>Decommissioning regulations state that operators must conduct decommissioning activities in a manner that is safe; does not unreasonably interfere with other uses of the OCS; and does not cause undue or serious harm or damage to the human, marine, or coastal environment.

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knowledge. If BSEE finds such pipelines, they told us that they issue a notice of noncompliance.

BSEE does not generally observe pipeline decommissioning activities while they are underway or conduct inspections after they are decommissioned. As a result, BSEE is unable to ensure that the pipelines were decommissioned properly. According to a BSEE official responsible for environmental compliance, operators do not always comply with the agreed-upon environmental mitigations but the extent to which this occurs is unknown because BSEE only learns of these departures incidentally. For example, according to this BSEE official, operators have occasionally disregarded BSEE's instructions, such as those not to place anchors in certain areas.<sup>43</sup> Although this BSEE official told us the bureau has not taken any actions against these operators, other BSEE officials said they are concerned about the potential negative consequences, such as damage to ecological or archaeological resources, if an operator does not follow the set environmental mitigations.

BSEE requires some evidence of the completion of pipeline decommissioning from operators but does not verify most of the information submitted. Prior to decommissioning, BSEE requires that operators submit a decommissioning application to BSEE for approval that specifies the proposed decommissioning procedures. After decommissioning, BSEE requires operators to submit a post-pipeline decommissioning report that includes (1) a summary of the decommissioning operation and date completed, (2) a description of any mitigation measures taken, and (3) a signed statement that certifies that the pipeline was decommissioned according to the approved application. BSEE officials told us that the bureau does not conduct onsite verification of the decommissioning activities prior to receiving the completion report, although they can compare the post pipeline decommissioning report to the approved pre-decommissioning application and existing pipeline data for discrepancies. As a result, BSEE relies solely on operator certification, specifically the post pipeline decommissioning report, as evidence that the pipelines were decommissioned properly.

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<sup>43</sup>Such instructions may be due to an unknown reading on a sonar scan taken prior to decommissioning. According to a BSEE official, unknown readings often end up being something unimportant, like platform equipment that fell into the water, such as a helmet, but that is not always clear on the scans.

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Additionally, BSEE does not require operators to verify that decommissioned pipeline sites are clear of obstructions, as it does for other infrastructure such as wells and platforms. Specifically, BSEE regulations require operators to perform site clearance and verification during the decommissioning of wells, platforms, and other non-pipeline facilities by, for example, dragging a trawl over a well site.<sup>44</sup> Operators must certify to BSEE that such sites are clear. However, because this verification is not required for pipelines, BSEE is unable to ensure compliance with decommissioning standards in this way.

BSEE's limited ability to ensure compliance with decommissioning standards prevents it from being able to ensure that it adequately addresses safety and environmental risks due to pipeline exposure, movement, and corrosion. For example, if pipelines are not properly buried or covered with concrete mats, they can become exposed and pose commercial fishing or navigational hazards. A BSEE official responsible for environmental compliance described instances in which operators certified that pipelines had been adequately covered, but ships later snagged trawling equipment on the pallets of concrete that were not actually deployed as pipeline covers. BSEE officials told us that they typically rely on NOAA to identify exposed pipelines.<sup>45</sup> According to NOAA information that BSEE provided, from June 2018 through June 2019, NOAA identified eight decommissioned pipeline segments that were exposed.<sup>46</sup> Additionally, exposure creates a greater likelihood of pipeline movement, which could cause safety and environmental harm, as previously discussed, including moving into areas of significant sediment resources; Essential Fish Habitats; and trawling areas, as well as disturbing historical artifacts and potentially other oil and gas infrastructure. Both BSEE and BOEM officials told us that movement is an issue for pipelines decommissioned-in-place, though they do not know the full extent.

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<sup>44</sup>Other options, depending on the type and depth of the facility, include scanning across the location using sonar equipment, inspecting the site using a diver, videotaping the site using a camera on a remotely operated vehicle, or using another method approved by the District Manager if the particular site conditions warrant. 30 C.F.R. § 250.1740.

<sup>45</sup>If a pipeline is found to be unburied, BSEE consults with BOEM to determine if the pipeline should be reburied or if it should be removed. Then, BSEE pursues the owner and directs the operator to submit the appropriate corrective action plan for review. If there is no previous existing operator, the government could incur the costs of pipeline removal.

<sup>46</sup>Until recently, BSEE did not have the ability to track exposed pipelines and subsequent operator responses and, therefore, data are limited.



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BOEM documentation indicates that long-term degradation of pipelines can compromise the structural integrity to the point where removal is not possible, which could result in the contamination of surface mineral deposits. Additionally, pipelines—and their related umbilicals—that are not cleaned properly may leak hazardous materials, such as hydrocarbons and chemicals, as pipelines corrode over time. Further, a BSEE official responsible for environmental compliance stated that there have been a few instances of operators not cleaning pipelines according to regulation, though the full extent of this is unknown because no independent verification occurs. For example, one operator was unable to clean a pipeline during decommissioning because they had already disconnected another piece of equipment necessary for such an operation.

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**BSEE Does Not Monitor Decommissioned Pipelines Left on the Seafloor or Have Funding Sources for Removal if They Later Pose Environmental or Safety Risks**

BSEE cannot ensure that it mitigates the long-term safety and environmental risks posed by pipelines decommissioned-in-place because it does not monitor their location or condition over time. The indefinite exposure to high currents caused by hurricanes, as well as other subsea phenomena such as mudslides, increases the likelihood that pipelines decommissioned-in-place will be subject to exposure or movement. Specifically, about 71 percent of pipelines decommissioned-in-place are in shallow waters of 200 feet or less, which studies indicate are more susceptible to exposure and movement than deep water pipelines—largely due to the increased forces of hurricanes on the current in shallow waters—especially if the pipelines were not buried properly.<sup>47</sup> As previously discussed, exposure and movement of pipelines can result in hazards to commercial fishing and navigation, interfere with other uses of the OCS, and have adverse environmental effects. However, BSEE does not have a process to track the location or condition of pipelines post-decommissioning-in-place. As a result, BSEE is unable to mitigate any risks that the pipelines might pose in the future that they do not pose at the time of decommissioning.

If BSEE does become aware that certain pipelines decommissioned-in-place later need to be removed, there are no financial assurances available for the costs of removal. BSEE can direct operators that had previous lease rights to remove pipelines that have become an

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<sup>47</sup>Det Norske Veritas, *Pipeline Damage Assessment from Hurricane Ivan in the Gulf of Mexico (2006)*, a report prepared at the request of the Department of the Interior, Minerals Management Service (May 16, 2006) and Southwest Research Institute, *Evaluation of Hurricane Induced Damage to Offshore Pipelines*, a report prepared at the request of the Department of the Interior, Minerals Management Service (March 1995).

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obstruction. However, officials told us that this is difficult to do and that the bureau has been largely unsuccessful in past cases. Specifically, officials told us that of the six operators who were told to remove pipelines after previously being allowed to decommission them in place, three were appealing BSEE's determination at the Interior Board of Land Appeals. In the other three cases, the operators have also not removed the pipelines, with only two of the operators submitting removal plans. BSEE officials explained that, once the bureau accepts operator certification of decommissioning-in-place, it is difficult to subsequently argue that the decommissioning was insufficient and compel operators to remove pipelines. Additionally, previous operators may be bankrupt, liquidated, and/or unreachable. In such cases, the government could incur the costs of pipeline removal.

At least 76 pipeline segments (over 129 miles) that are decommissioned-in-place and have no existing previous operator are located on areas of significant sediment resources, a number that BSEE officials said could increase, due to growth in operator bankruptcies. Specifically, the amount of uncovered pipelines needing to be removed could increase because the current amount represents a small fraction of the 2,447 pipeline segments (over 3,600 miles) that BSEE approved to be decommissioned-in-place in areas of significant sediment resources prior to BOEM's 2016 memorandum to BSEE stating that pipelines in such areas should be decommissioned by removal. Therefore, future operator bankruptcy could result in additional uncovered pipeline removal costs for the federal government. See appendix I for a discussion of BSEE's role in financially protecting the government from incurring costs when an operator is unable to perform required decommissioning at the conclusion of a pipeline's active life cycle. Additionally, this represents an example of how additional uses for the OCS can be discovered over time. Indeed, BSEE officials told us that it is conceivable that other areas of the OCS in which BSEE currently authorizes decommissioning-in-place might in the future be determined to have uses with which pipelines would interfere. If that occurs, the uncovered costs to remove pipelines would likely increase. A 2004 BSEE-sponsored study estimated that the removal of all existing pipelines at that time—which were almost exclusively in shallow water and, therefore, less expensive to remove—would cost over \$21.5 billion (adjusted to fiscal year 2019 dollars).<sup>48</sup> This estimate does not account for the nearly 8,500 miles of pipeline installed since the 2004 study (about 66

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<sup>48</sup>Scandpower Risk Management Inc., *An Assessment of Safety, Risks and Costs Associated with Subsea Pipeline Disposals*.

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percent of which are in deep water and, therefore, theoretically more expensive to remove), meaning the actual amount is likely significantly higher.

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### BSEE Has Made Limited Progress Updating Regulations to Enhance Its Ability to Address Safety and Environmental Risks Associated with Decommissioning

BSEE has long recognized the need to update its regulations to better address the risks associated with decommissioning pipelines by updating decommissioning standards to reflect the complexities of modern deep water pipeline operations but has made limited progress in doing so. BSEE officials also told us that updating the regulations could improve BSEE's oversight processes before, during, and after pipeline decommissioning by better defining how the bureau is to address the associated safety and environmental risks. To address what it considers to be outdated regulations that were originally promulgated in 1988, BSEE (then the Mineral Management Service) in 2007 published a proposed rule to revise its pipeline regulations that included changes intended to enhance safety and protect the environment. This proposed rule addressed offshore pipeline decommissioning, including new requirements regarding the decommissioning of pipeline-related structures, such as umbilicals. However, the effort stalled, and the bureau did not move beyond proposing the rule. BSEE officials explained this was largely due to the 2010 Deepwater Horizon incident and that subsequent regulatory efforts took precedence.

In its budget justifications for fiscal years 2014, 2015, and 2016, BSEE noted plans to update its pipeline regulations. In a 2017 document advocating to reinstate the effort, a BSEE official responsible for pipeline management cited the benefits to safety and environmental protection of doing so. Further, in a 2019 document, the same official stated that the existing regulations are technologically behind and do not address the complexities of deep water pipeline decommissioning. For example, pipeline-related structures such as umbilicals, pipeline-end manifolds, and pipeline-end terminals were not in widespread use at the time the current regulations were promulgated.<sup>49</sup> Further, the BSEE official cited the benefits of incorporating existing policy and guidance into regulation, thereby making those standards enforceable. BSEE officials we interviewed explained that, because the existing regulations do not mention any aspect of deep water operation, it is difficult to compel

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<sup>49</sup>Pipeline-end terminals and pipeline-end manifolds are large, pipeline-related structures that direct the flow of hydrocarbons. BSEE has already received requests to decommission these structures in place, although they have not made any decisions regarding these requests. According to a BSEE official responsible for environmental compliance, there is not a good way to clean them in the water.

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operators to take certain actions, such as ensuring the proper decommissioning of pipeline-related structures.

However, as previously noted, in the nearly 8 years since BSEE reinitiated its efforts to update its pipeline regulations—and more than 13 years since it published a proposed rule—BSEE has made limited progress in doing so. Without taking actions to further develop, finalize, and implement updated pipeline regulations, BSEE will continue to be limited in its ability to address long-standing limitations in its ability to ensure that its offshore oil and gas pipeline decommissioning processes address the safety and environmental risks associated with pipeline decommissioning.

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## Conclusions

In 2007, BSEE published a proposed rule to update its pipeline regulations that included changes intended to enhance safety and protect the environment. This proposed rule addressed (1) offshore pipeline integrity, including new requirements regarding pipeline inspection and subsea leak detection technologies; as well as (2) offshore pipeline decommissioning, including new requirements regarding the decommissioning of pipeline-related structures, such as umbilicals. However, the effort stalled, and the bureau did not move beyond proposing the rule. In the intervening 13 years, BSEE has repeatedly noted plans to complete updates to its pipeline regulations but has made limited progress, and it is not clear at this point when the bureau will propose a new rule. Without taking actions to further develop, finalize, and implement updated pipeline regulations, BSEE will continue to be limited in its ability to address long-standing limitations in its ability to ensure (1) the integrity of active offshore oil and gas pipelines that increase the safety and environmental risks associated with their operation and (2) that the offshore oil and gas pipeline decommissioning process addresses the safety and environmental risks associated with their decommissioning.

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## Recommendation for Executive Action

The BSEE Director should take actions to further develop, finalize, and implement updated pipeline regulations to address long-standing limitations regarding its ability to (1) ensure the integrity of active offshore oil and gas pipelines and (2) address safety and environmental risks associated with their decommissioning. (Recommendation 1)

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## Agency Comments

We provided a draft of this report to Departments of the Interior, Commerce, Homeland Security, and Transportation as well as the Environmental Protection Agency. In its written comments, reproduced in appendix II, Interior generally agreed with our findings and concurred with

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our recommendation. The Department of the Interior and the Environmental Protection Agency also provided technical comments, which we incorporated as appropriate. The Departments of Commerce, Homeland Security, and Transportation did not provide comments.

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As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Secretaries of the Interior, Commerce, Homeland Security, and Transportation; the Administrator of the Environmental Protection Agency; and other interested parties. In addition, the report will be available at no charge on the GAO website at <https://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or [ruscof@gao.gov](mailto:ruscof@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 major contributions to this report are listed in appendix III.

A handwritten signature in black ink that reads "Frank Rusco". The signature is written in a cursive style and extends to the right with a long, thin horizontal stroke.

Frank Rusco  
Director, Natural Resources and Environment

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# Appendix I: The Bureau of Safety and Environmental Enforcement's Role in the Financial Assurance Process

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Financial assurances are collected from operators in advance of offshore oil and gas exploration and development operations to financially protect the government from incurring costs when an operator is unable to perform required pipeline decommissioning. The Department of the Interior's Bureau of Safety and Environmental Enforcement (BSEE) and Bureau of Ocean Energy Management (BOEM) work together to oversee the financial assurance process. Specifically, BSEE is responsible for providing BOEM with decommissioning cost estimates that BOEM uses to determine, and later secure, financial assurances from operators. BSEE officials stated that, historically, BSEE has struggled to accurately develop decommissioning cost estimates, leading to concerns from both BSEE and BOEM officials that the amount of financial assurances that BOEM collected did not reflect actual decommissioning costs and was probably too low.

In an effort to improve the bureau's decommissioning cost estimates, BSEE published a final rule in 2015 requiring operators to submit their final decommissioning costs for certain decommissioning activities. In late 2016, BSEE amended this rule to include final costs for decommissioning pipelines, for both pipeline removal and decommissioning-in-place. In 2017, BSEE issued guidance intended to clarify standards regarding the submission of decommissioning cost data.

However, a BSEE official explained that three key issues have not yet been fully addressed by the guidance and that more time is needed to determine whether it will better enable BOEM to collect adequate financial assurances to cover the costs of pipeline decommissioning. First, the level of detail reported thus far is inconsistent across operators—making some of the data collected to date difficult to use. Second, over 86 percent (551 of 639 segments) of the cost data submitted covers decommissioning-in-place costs rather than pipeline removal. As a result, this limits BOEM's ability to collect financial assurances that cover the costs required to remove pipelines at the end of their useful lives, which is the default requirement under BSEE's regulations. Third, the cost estimate data largely cover shallow water decommissioning, yet deep water pipelines account for over 28 percent (over 5,800 miles of the 20,600 miles) of active pipelines that will require decommissioning in the future. As a result, BSEE's decommissioning cost estimates may be inaccurate and, therefore, BOEM may have collected an insufficient amount of financial assurances from operators. This could potentially result in costs to the government if operators are unable to cover the costs of decommissioning.

# Appendix II: Comments from the Department of the Interior



United States Department of the Interior  
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT  
WASHINGTON, DC 20240-0001

Mr. Frank Rusco  
Director  
Natural Resources and Environment  
Government Accountability Office  
441 G Street, NW  
Washington, DC 20548

Dear Mr. Rusco:

Thank you for providing the Department of the Interior (Department) the opportunity to review and comment on the Government Accountability Office (GAO) draft report entitled, *Offshore Oil and Gas: Updated Regulations Needed to Improve Pipeline Oversight and Decommissioning* (GAO-21-293). We appreciate GAO's review and feedback.

The Department generally agrees with the report findings and concurs with the recommendation directed to the Bureau of Safety and Environmental Enforcement (BSEE):

**Recommendation 1:** "The BSEE Director should take actions to further develop, finalize, and implement updated pipeline regulations to address long-standing limitations regarding its ability to (1) ensure the integrity of active offshore oil and gas pipeline and (2) address safety and environmental risks associated with their decommissioning."

BSEE has begun to implement GAO's recommendation to further develop, finalize, and implement updated pipeline regulations to address long-standing limitations regarding its ability to (1) ensure active pipeline integrity and (2) address safety and environmental risks associated with decommissioning.

BSEE has actively been working towards publication of the AA45 – Subpart J – Pipelines and Pipeline Rights-of-way (ROW) rewrite. BSEE started these rulemaking efforts in December 2019 and formed a BSEE pipeline rulemaking team that has been meeting weekly since March 2020. The rulemaking team has examined issues raised by the bureau's 2007 published proposed pipeline rule, public comments, industry listening sessions, and internal subject matter expert discussions. BSEE's rulemaking team continues to review the most recent industry technical standards relating to pipeline safety, reliability, maintenance, and environmental protection.

The proposed Subpart J rule would incorporate into agency regulations BSEE's technical guidance on pipeline safety and environmental enforcement found in BSEE policy documents

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**Appendix II: Comments from the Department  
of the Interior**

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(e.g., Notice to Lessees (NTLs), Letter to Lessees (LTLs)). BSEE has also reviewed current pipeline permitting procedures, including associated conditions of approvals, and has incorporated those practices into the proposed rule. BSEE is initiating this proposed rule to clarify current practices and regulatory requirements while maintaining safety and environmental protections. This rulemaking would result in an up-to-date set of pipeline regulations that reflect technological advancements, industry best practices, and lessons learned from implementing existing requirements. Due to the significant differences since the publication of the 2007 proposed rule, this rulemaking has taken additional time to not only review the proposed 2007 rule content, but to revise it based on current technology, practices, and permitting.

The AA45 proposed rulemaking includes significant revisions to the following topics: jurisdictional clarifications, industry standards incorporation, service fees, pipeline applications, pipeline design, pipeline fabrication, pipeline installation, third party reviews, pipeline testing, safety equipment, pipeline leak detection, operations, maintenance, modifications, repairs, monitoring, inspections, decommissioning, reporting, ROW grants, accessories, and umbilicals. BSEE recognizes the importance of an updated comprehensive set of pipeline regulations and continues to work diligently towards publication of the proposed rule and push this rulemaking as a regulatory priority as shown on Office of Information and Regulatory Affairs' s (OIRA) Unified Agenda of Regulatory and Deregulatory Actions (see <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202010&RIN=1014-AA45>).

Additionally, general and technical comments are enclosed for your consideration when finalizing the report.

If you have any questions concerning this response, please contact Chanielle Williams, BSEE Audit Liaison Officer, at 202-322-7605.

Sincerely,

**Laura Daniel-Davis**  
Digitally signed by Laura Daniel-Davis  
Date: 2021.03.11 08:19:31 -05'00'

Laura Daniel-Davis  
Senior Advisor to the Secretary,  
Exercising the Delegated Authority of the  
Assistant Secretary, Land and Minerals Management

Enclosure



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# Appendix III: GAO Contact and Staff Acknowledgments

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## GAO Contact

Frank Rusco, (202) 512-3841 or [ruscof@gao.gov](mailto:ruscof@gao.gov)

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## Staff Acknowledgments

In addition to the individual named above, David Marroni (Assistant Director); Matthew Tabbert (Analyst-in-Charge); Colson Campbell; Antoinette Capaccio; Nirmal Chaudhary; Cindy Gilbert; Gwen Kirby; Corinna Nicolaou; and Dan Royer made significant contributions to this report.

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