

concluded that underwater inspections for depth of burial of those pipelines were not being performed despite a requirement to place pipelines below the sea floor in shallow water. To reduce the likelihood of further casualties, the task force recommended that operators inspect these pipelines at regular intervals and rebury exposed pipelines.

The task force further concluded that safety problems with submerged pipelines are not confined to the offshore areas of the Gulf of Mexico. Although the Gulf contains many submerged pipelines and has sea bottoms most prone to erosion, pipelines under a river, shipping channel, or other body of water are also susceptible to being exposed and damaged or ruptured by a vessel. The task force recommended periodic depth of burial inspections for all submerged pipelines that could pose a hazard to navigation. A copy of the report is available in the docket for this rulemaking.

#### Legislative Amendments

In November 1990, Congress addressed this safety issue in amendments to the Hazardous Liquid Pipeline Safety Act of 1979 and the Natural Gas Pipeline Safety Act of 1968 (Pub. L. 101-599). These amendments, in part, required the operators of offshore pipeline facilities in the Gulf of Mexico and its inlets to conduct an underwater depth-of-burial inspection of the pipeline facility and to report any exposed portion or any portion of the pipeline facility which posed a hazard to navigation to the Secretary of Transportation. The 1990 amendments also required the Secretary of Transportation to establish a mandatory, systematic, and, where appropriate, periodic pipeline inspection and reburial program for all shallow water submerged pipelines in the Gulf of Mexico and its inlets.

On December 5, 1991, RSPA/OPS published regulations requiring underwater inspections (56 FR 63764). Over 1,560 miles of pipeline in the Gulf of Mexico were inspected. Approximately 25 miles, less than two percent of the inspected pipeline was reported to be exposed or to be a hazard to navigation. In 1992, Congress expanded the requirement to include all offshore pipelines, (including over 600 miles of pipelines off California and Alaska), underwater abandoned pipeline facilities, and all other pipeline facilities which cross under, over, or through navigable waters, if the location could pose a hazard to navigation (Pub. L. 102-508).

#### National Research Council Report

To gain a perspective on risks to be addressed by the Congressionally mandated inspections, RSPA/OPS, in conjunction with other Federal agencies, requested that the Marine Board of the National Research Council conduct an interdisciplinary review and assessment of the many technical, regulatory, and jurisdictional issues that affect the safety of the marine pipelines in the United States' offshore waters. The Committee on the Safety of Marine Pipelines reviewed the causes of past pipeline failures, the potential for future failures, and the means of preventing or mitigating these failures. In 1994, the Marine Board issued a report, *Improving the Safety of Marine Pipelines*. A copy of this report is available for review in the docket for this rulemaking.

The committee determined that the marine pipeline network does not present an extraordinary threat to human life. Pipeline accidents involving deaths or injuries are rare. The most widespread risks are due to oil pollution, mainly from pipelines damaged by vessels and their gear. The report noted that "[d]amage from vessels (and especially from anchors and groundings) is dramatically more

significant than corrosion as a source of pollution. Ninety-five percent of the pipeline related pollution on the Outer Continental Shelf (OCS) was due to such incidents. Anchor damage alone accounted for 90 percent of the pipeline related pollution." The committee concluded that the risks generally could be managed with currently available technology and without major new regulations if enforcement of some current regulations is improved. Better coordination among operators and regulators in gathering safety data, assessing risks, and planning and implementing risk management programs was cited as a fundamental safety requirement. The committee noted that "[i]n shallow water the best protection against the interference of vessels and pipelines, generally, is burial of the pipelines, with enough weight coating to keep it in place \* \* \* [a]chieving and maintaining adequate burial requires care and vigilance." The committee recommended that operators inspect the depth of burial of underwater pipelines at intervals determined by analysis of the probabilities of risks. A detailed approach is outlined in the report.

High risk areas are zones of high density of pipelines; high density of vessel traffic; shallow waters; the immediate vicinity of platforms; areas of severe erosion or shift of the sea floor and high potential for flooding; and areas affected by hurricanes or severe storms. According to the Marine Board Report, surveys of pipelines could be scheduled in accordance with the relatively predictable behavior of sediment and shoreline erosion. Surveys could also be performed after the passage of major storms.

The Marine Board report identified the characteristics of the Gulf of Mexico shoreline and seabed dynamics and identified the pipeline safety issues and inspection needs associated with those dynamics as follows:

Region	Shoreline	Seabed	Pipeline safety issue
Nondeltaic .....	Localized retreat .....	Stable .....	Occasional exposure at shoreline deposition on seabed.
Chenier plain .....	Rapid and generalized retreat .....	Very dynamic top layer of unconsolidated muds.	Storm-induced cover loss; gradual cover loss.
Barrier Islands .....	Active dynamics primarily on the island and shoals.	Rapid to gradual generalized siltation; localized erosion and seabed shifting.	Rapidly changing shorelines and island/shoal crossing; storm-induced changes.
River mouth .....	Very rapid change; some retreat, some advance.	Slumping .....	Storm induced slides.

Depth of Cover inspection needs for different shorelines and seabed regimes: