

Detailed Analysis

1. General.

The results from the screening analysis cost-effectiveness phase indicated that for tank vessels in both the international and U.S. coastal fleets, the appropriate measures to analyze in depth included: (1) pre-MARPOL vessels with a combination of PL/CBT and HBL (measure 3), and (2) for both MARPOL 73 vessels and MARPOL 78 vessels, an HBL measure on certain tanks (measure 2.b.). Although MARPOL 78 model tank vessels were not analyzed in the screening analysis, these vessels are similar to MARPOL 73 vessels in terms of oil outflow and related characteristics.

The screening analysis measure 3, pre-MARPOL vessels with a combination of PL/CBT and HBL, was chosen over measures 1.b and 1.c because of its overall cost-effectiveness and accidental oil outflow mitigation characteristics. In general, implementation of measure 1.c. results in higher oil outflow when bottom damage occurs. The cost effectiveness of measure 1.b and measure 3 may be considered to be roughly equivalent, however, the accidental oil outflow cost effectiveness for pre-MARPOL 264,000 dwt tankers in 34 percent greater for both international and U.S. coastal tank vessels.

To analyze the measures further, four steps were taken. First, the affected vessel population was determined and categorized by the three vessel categories. Second, a cost analysis was conducted including per vessel and total cost estimates. Then a benefit estimate was developed based on an expanded range of analytical tank vessel models developed with the same assumptions and criteria used for the

screening analysis. Finally, a cost-benefit analysis was developed along with an effectiveness analysis.

Data on the world tanker fleet was obtained from several sources, including Lloyd's Maritime Information Services, Clarkson Research Studies Limited, Coast Guard Marine Safety Management System, and industry. Vessels that are expected to comply with this rulemaking were identified based on whether the vessel had complied with current financial responsibility regulations as implemented under OPA 90 and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended. All oil tankers in the world fleet that complied with the Coast Guard's financial responsibility final rulemaking (59 FR 34210) requirements to obtain a Certificate of Financial Responsibility (COFR) as of April 30, 1995, were used as a baseline tank vessel population for this assessment. A check of the COFR database was completed to update the tank vessel numbers and make them reflect COFRs issued as of August 30, 1995. An alternative approach was also developed to assess the accuracy of using COFRs to define the baseline fleet. Port call data from 1991 to 1993 was obtained for U.S. ports, including the Louisiana Offshore Oil Port (LOOP). This data was matched with the worldwide tanker database to estimate the number of annual port calls to and from the U.S. for tank vessels in the international fleet.

Once the affected fleet was identified, vessels were categorized into one of the three vessel categories: pre-MARPOL, MARPOL 73, and MARPOL 78. Because the measures vary depending on vessel category, total fleet compliance costs and the number of barrels of spilled oil

avoided as a result of the measure vary significantly depending on the distribution of the existing tank vessel fleet by vessel category. This categorization was based primarily on the vessel's delivery date, deadweight tonnage, and type (product or crude carrier). Vessels permitted to engage in U.S. coastal trade are commonly referred to as Jones Act vessels and are required to be built and flagged in the United States. These vessels must, in general, be serviced and repaired in the United States, and were designated to be in the U.S. coastal trade. Because not all U.S. flag vessels qualify as Jones Act tankers, U.S. flag tankers that operate on routes to international ports were included in the international fleet. Analysis of port call data confirmed that these vessels are engaged in international trade.

2. Costs

The incremental costs for existing single hull tank vessels to comply with the proposed measures were estimated for eight international tank vessel models and six U.S. coast tank vessel models, and for three vessel categories: pre-MARPOL, MARPOL 73, and MARPOL 78. To estimate total costs, the baseline fleet of existing single hull tank vessels was projected from 1996 to 2015 based on the double hull rulemaking phaseout schedule. Once the regulated baseline fleet are defined and projected from 1996 to 2015, total costs were estimated by multiplying the number of vessels projected to be in operation in a given year by the appropriate per-vessel compliance cost estimates. Table 5 summarizes the estimated fleet categorization and the phaseout of tank vessels affected by this rulemaking.

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