

Has MARPOL reduced intentional oil discharges?

By Mr. Ronald B. Mitchell

Most people usually associate oil pollution with massive tanker accidents. Historically, however, intentional oil discharges from tanker operations accounted for twice as much ship-related oil pollution as accidents. During tank cleaning and deballasting, tankers intentionally discharged mixtures of sea water and oil residues clinging to tank walls.

While this clingage represented only about three to five percent of a typical tanker's total cargo, this amounted to discharges of 300 to 500 tons of oil on each voyage. Given the vast amount of oil transported by sea, such discharges started to present a major pollution problem, prompting negotiation of the International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL) in 1954.

Initial regulatory efforts under OILPOL consisted of prohibiting tankers from discharging more than specified amounts within 50 miles of shore. Amendments in 1969 supplemented these "rate and location" limits with restrictions on total discharges.

By the early 1970s, however, environmentally concerned countries, led by the United States, viewed compliance with these standards as inadequate, and successfully urged that all large tankers built after 1979 be required to install segregated ballast tanks as part of revised oil pollution regulations that became Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL) in 1973.

Revisions in the 1978 protocol produced a three-tiered regulatory structure for large tankers. Those built before 1980 had to install either segregated ballast tanks or crude oil washing equipment. Those built between 1980 and 1982 had to install segregated ballast tanks alone. Those built after 1982 had to install both systems.

MARPOL has had both successes and failures in influencing the behavior of the oil transportation industry.

MARPOL successes and failures

Assessing the effectiveness of MARPOL regulations requires answering three questions.



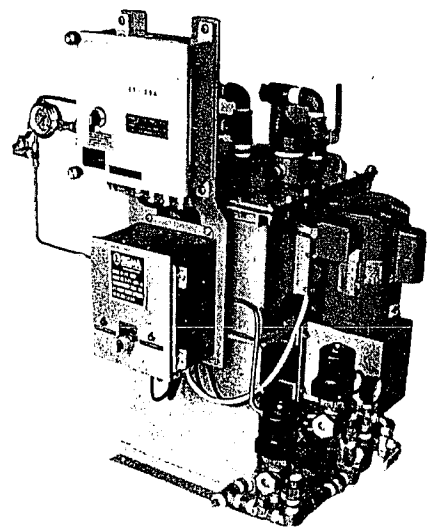
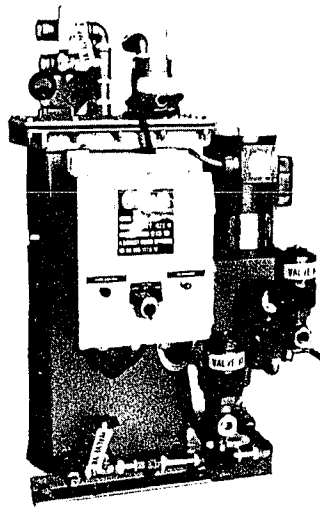
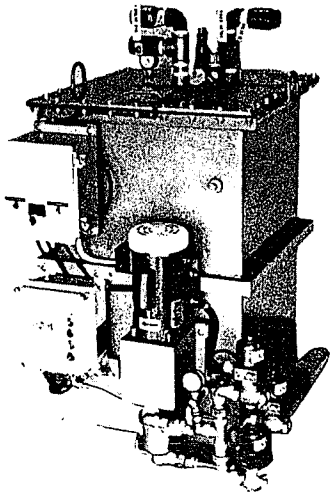
The tedious, costly job of dispersing intentional oil spills should not be necessary under MARPOL.

Photo by PA3 Brandon Brewer.

- *Do tanker owners and operators comply with the rules?*
- *Is compliance due to MARPOL provisions or to other factors?*
- *Has compliance led to decreased intentional oil pollution?*

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*Crude oil washing
equipment
saves oil tanker
operators money.*



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Compliance

Available evidence suggests that many tanker operators did not comply with discharge standards prior to MARPOL. The data is spotty, but both the absence of significant decreases in oil slick sightings, the difficulties of detecting, prosecuting and sanctioning violating tankers, and additional anecdotal evidence suggest that tanker operators had few incentives to change their behavior.

The only consistent data collected on actual discharges comes from oil company surveys conducted in the mid-1970s. This data demonstrates that the actual discharges for oil company tankers decreased dramatically from 1972 to 1975, but were still three times the legal limit in 1977. Independent tankers' discharges showed little decline and were more than 30 times the limit in 1977.

With respect to equipment standards, tanker owners have complied almost perfectly with the requirements to install segregated ballast tanks and crude oil washing equipment. Ninety four percent of crude oil tankers constructed before 1980 installed one or the other, as required, and 32 percent installed both. Of the tankers constructed between 1980 and 1982, 98 percent complied with the ballast tank requirement. Of those built after 1982, 98 percent had installed both and all ships had at least one.

Cause

Determining whether MARPOL brought about this compliance requires evaluating the effect of other factors on tanker operations.

For one thing, the timing of the decreases in discharges for both independents and oil company tankers corresponds more with the dramatic oil price hike of 1973 than with the 1969 passage of the total discharge limit and its enforcement in 1978. Oil companies own the oil their tankers transport, which provides a strong incentive to conserve an increasingly valuable cargo. This was reflected in a dramatic decrease in intentional oil discharges by oil company tankers between 1972 and 1975. Independent tankers, lacking such economic incentives, had small decreases in comparison.

Other considerations included the costs and benefits of each type of equipment. Even after accounting for installation costs, crude oil washing equipment saved a tanker almost \$9,000 per voyage. It increased the oil delivered by reducing the amount left clinging to tank walls. In contrast, the greater costs of installing segregated ballast tanks had no such offsetting benefits, imposing a net cost of \$1,500 per voyage on tanker operators.

The response to these economics is clearly evident. Of tankers built before 1980 that could choose between the two systems, 89 percent installed the washing equipment, while only 36 percent installed the ballast tanks. The washing equipment was also installed on 95 percent of tankers between 1980 and 1982, even though it was not required. However, when required, the segregated ballast tanks were installed. This confirms that many washing equipment installations would have taken place without MARPOL requirements, while most ballast tank installations occurred in response to MARPOL.

The equipment standards were more successful than discharge standards, because they rely on regulations that prevent rather than simply deter violations. Discharge standards tried to make violations less attractive by making violators believe they would be detected and stiffly reprimanded, a difficult task considering the obstacles to effective monitoring and enforcement. In contrast, the equipment standards relied on making violations more difficult, because buying an illegally equipped tanker required the unlikely cooperation of a shipbuilder, a classification society and an insurer.

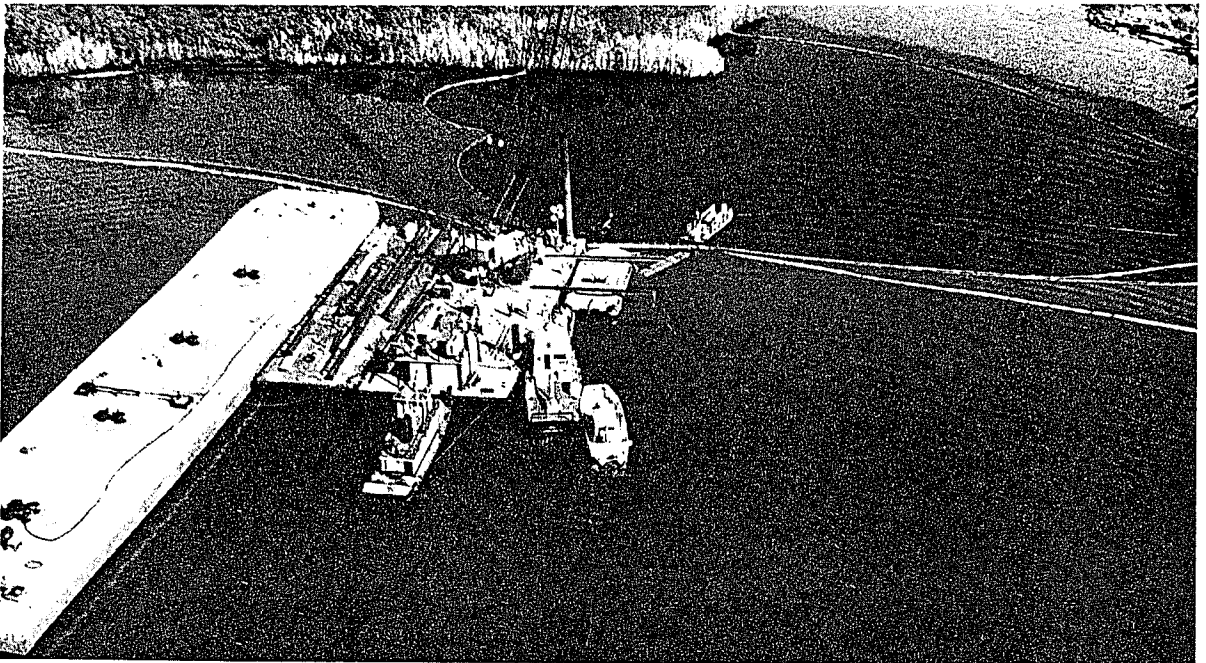
Results

Demonstrating that compliance with equipment standards has resulted in a cleaner marine environment is difficult. With approximately 98 percent of all tankers having one or the other type of equipment installed, the pressure to discharge at sea has been vastly decreased.

Intentional discharges do seem to be declining, but have not been eliminated. Coast Guard data show that total intentional discharges have declined from almost 600 per year in 1973 to less than 250 in 1982 through 1986, with much of the latter discharges from bilge pumping rather than ballasting.

However, continued oiling of seabirds and lower-than-expected receipt of waste oil in port reception facilities suggest that many tankers continue to discharge waste oil at sea. Even tanker representatives admit that discharge limits are sometimes violated due to the absence of reception facilities in some ports and because of charter agreements requiring arrival with clean tanks.

*Containment boom and accompanying equipment would be superfluous without oil pollution.
Photo by PA3 Jeff Murphy.*



*"...much progress has been made,
but much remains to be done."*

Conclusion

The most accurate conclusion to be drawn from available data is that MARPOL's standards caused many tanker owners to install segregated ballast tanks when they would not have done so otherwise, that both MARPOL and economic factors led to the installation of crude oil washing equipment, and that together, these installations have reduced intentional discharges of oil.

Such discharges continue, however, because of the difficulties in effectively monitoring and enforcing MARPOL standards, especially on the high seas. In short, much progress has been made, but much remains to be done.

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