

INTERNATIONAL LAW AND INTERNATIONAL RELATIONS

Edited by **Beth A. Simmons**
and **Richard H. Steinberg**

applying this 100 ppm standard to discharges made by new tankers regardless of their distance from shore.

The principle underlying the 1962 amendment – that crude oil could float far enough that discharge zones would not effectively protect coastlines – had gained sufficient support by 1969 that nations agreed to limit discharges by all tankers throughout the ocean. The pressure to amend the 1954/62 agreement came from two different sources. On one side, the thirty-five million gallons of oil spilled by the grounding of the *Torrey Canyon* off Britain and France [in 1967] and growing environmentalism, especially in the United States, supported a push for stronger regulations.¹⁷ The previously resistant United States replaced the United Kingdom as the leading activist state and especially sought to ensure that amendments would address the growing evidence of enforcement problems ***.

On the other side, oil companies rightly interpreted the 1962 amendments as a wake-up call that discharge standards would soon be replaced by expensive equipment requirements. In response, Shell Marine International developed and promoted an operational means by which tankers could reduce oil discharges without *** new equipment.¹⁸ The load-on-top procedure (LOT) involved consolidating ballast and cleaning slops in a single tank, *** [decanting the water from beneath the oil,] and loading the next cargo on top of the remaining slops. The beauty of LOT was that it [wasted less cargo,] thereby advancing both [environmental and economic goals.] *** The problem was that normal operation of LOT produced discharges that exceeded the 100 ppm standard. If this criterion had remained in effect, tankers would have had to install expensive new equipment ***. With the support of France, the Netherlands, Norway, and the now less-activist United Kingdom, oil and shipping companies therefore also sought to amend the treaty. Oil companies considered LOT so effective that they wanted diplomats to scrap the 1954/62 zonal approach altogether. The pressures for greater environmental protection, however, led them to support the more limited objective of redefining the limits on discharges from the 100 ppm “content” criterion to one that could be monitored using existing onboard equipment.¹⁹

In a unanimously accepted compromise in 1969, more stringent and enforceable regulations were framed in terms that averted equipment

¹⁷ M’Gonigle and Zacher, *Pollution, Politics, and International Law*, p. 100.

¹⁸ J. H. Kirby, “The Clean Seas Code: A Practical Cure of Operation Pollution,” in *Third International Conference on Oil Pollution of the Sea: Report of Proceedings, Rome 7–9 October 1968* (Winchester, England: Warren and Son, 1968), pp. 201–19.

¹⁹ Kirby, “The Clean Seas Code,” p. 206.

requirements. Within the fifty-mile near-shore zones, discharges could now only involve “clean ballast” that left no visible trace; outside the fifty-mile zones, discharges could not exceed 60 liters of oil per mile (60 l/m). Proponents argued that the clean ballast provision would improve enforcement by transforming any sighting of a discharge into evidence of a violation.²⁰ The more crucial change involved a new limit that total discharges not exceed one fifteen-thousandth of a tanker’s capacity.²¹ Although compliance with this standard required a tanker to reduce its average discharges by almost 98 percent, Shell’s J. H. Kirby claimed that “any responsibly run ship, no matter how big, could operate” within these standards if it used LOT.²² The low total discharge limit also allowed port authorities to assume that any tanker with completely clean tanks *** had violated the agreement.²³ These standards took effect in 1978 and remain in force today through their incorporation into the 1973 MARPOL agreement.

The Equipment Subregime

By the early 1970s, public concern was pushing environmental issues onto the international political scene with increasing frequency. The United Nations Conference on the Human Environment and negotiation of the London Dumping Convention in 1972 set the stage for a major overhaul of the OILPOL agreement. IMCO hosted a major conference in 1973 to negotiate the MARPOL treaty. Its goal was the replacement of OILPOL’s rules with rules that would cover all major types of vessel-source marine pollution.

The U.S. government had become increasingly concerned that the ease with which tanker crews could violate discharge standards and the massive resources and diligence needed to detect violations were preventing effective mitigation of the growing oil pollution problem.²⁴ By 1972,

²⁰ Assembly resolution 391, IMCO/IMO doc. resolution A.391(X), 1 December 1977, Annex, par. 5. All document citations herein refer to IMCO/IMO documents housed in the IMO Secretariat library. ***

²¹ 1969 Amendments to the *International Convention for the Prevention of Pollution of the Sea by Oil*, 21 October 1969, reprinted in Bernd Ruster and Bruno Simma, eds., *International Protection of the Environment: Treaties and Related Documents* (Dobbs Ferry, N.Y.: Oceana Publications, 1975).

²² Kirby, “The Clean Seas Code,” p. 208.

²³ See Kirby, “The Clean Seas Code,” pp. 200 and 209; and William T. Burke, Richard Legatski, and William W. Woodhead, *National and International Law Enforcement in the Ocean* (Seattle: University of Washington Press, 1975), p. 129.

²⁴ M’Gonigle and Zacher, *Pollution, Politics, and International Law*, p. 108.

Congress had adopted legislation that threatened to require all American tankers as well as all tankers entering U.S. ports to install expensive pollution-reducing equipment. The legislation included a proposal to require all large tankers to install double hulls to address accidental spills and segregated ballast tanks (SBT) to address intentional discharges. The SBT system involved arranging ballast tanks and associated piping such that ballast water could not come into contact with oil being carried as cargo. The system was expensive both in terms of capital and the reduction to cargo-carrying capacity. The United States sought international agreement to require SBT but threatened to require it unilaterally if necessary. Discharge requirements clearly were cheaper, more economically efficient, and "in theory . . . a good idea."²⁵ However, environmental pressures and growing evidence that LOT was neither as widespread nor as effective as had been hoped led the United States and the United Kingdom to support rules that offered easier and more effective enforcement.

The largely U.S.-based oil companies initially opposed SBT requirements but eventually supported them as preferable to threatened U.S. unilateral rules. Many shipping states also reluctantly supported SBT requirements. They believed such requirements would avert an even more costly double bottom requirement. It was also fiscally acceptable: the combination of a recent building boom and the proposed language of the requirements meant that tanker owners would only have to incur the additional costs of SBT many years in the future and then only for large tankers. However, governments representing shipbuilding interests (France and Japan) and those representing independent tanker owners (Denmark, Germany, Greece, Norway, and Sweden) opposed the requirement.²⁶ By a vote of thirty to seven, the conference adopted a requirement for tankers over 70,000 tons built in 1980 and later to install SBT.

By 1977, a spate of accidents in the United States and continuing enforcement concerns led President Jimmy Carter to propose that SBT requirements be applied to all tankers, not just large new tankers.²⁷ Given (1) that the United States was again explicitly threatening unilateral action and (2) that the 1973 MARPOL agreement [had only been ratified

²⁵ See statements submitted by the U.S. delegation to the 13th Preparatory Session for an International Conference on Marine Pollution in 1973: IMCO/IMO doc. MP XIII/2(c)/5, 23 May 1972. ***

²⁶ M'Gonigle and Zacher, *Pollution, Politics, and International Law*, p. 114.

²⁷ Jacob W. Ulvila, "Decisions with Multiple Objectives in Integrative Bargaining," Ph.D. diss., Harvard University, 1979, appendix A1.1.

by three states,] IMCO called a second major conference in 1978. State positions reflected the fact that retrofitting existing tankers with SBT would reduce each tanker's (and the fleet's) cargo capacity by some 15 percent.²⁸ Greece, Norway, and Sweden saw this as a means to put scores of their laid up independent tankers back to work. However, most states saw SBT retrofitting as extremely expensive.²⁹ Just as the 1962 amendments had prompted LOT development, the 1973 MARPOL agreement prompted oil companies to perfect a technique known as crude oil washing (COW), which entailed spraying down cargo tanks with the cargo itself rather than with seawater. Operating COW equipment during cargo delivery transformed oil that otherwise would have been discharged as slops into usable delivered cargo, simultaneously reducing oil pollution and increasing cargo owner revenues. The industry proposal for COW as an alternative to SBT produced a compromise in which tankers built after 1982 had to install both SBT and COW, while existing tankers had to be retrofitted with either SBT or COW by 1985. The 1978 Protocol Relating to the International Convention for the Prevention of Pollution from ships was made an integral part of the 1973 MARPOL agreement. While MARPOL and its protocol, known collectively as MARPOL 73/78, did not enter into force until 1983, their standards regulated all new construction after 1979.

OBSERVED COMPLIANCE LEVELS

Available evidence demonstrates a wide divergence in levels of compliance under these two subregimes. During the same time period in which almost every tanker owner was retrofitting existing tankers and buying new tankers to conform with MARPOL's requirements for SBT and COW, large numbers of tanker operators continued to discharge oil well in excess of legal limits. ***

Violations of the clean ballast, 60 l/m, and total discharge standards in place since 1978 have been common. Oil company surveys from the 1970s show that neither oil company nor independent tankers reduced average discharge levels to the one fifteen-thousandth limit in any year between 1972 and 1977 (see Figure 25.1). Although oil company tankers

²⁸ See Sonia Z. Pritchard, "Load on Top: From the Sublime to the Absurd," *Journal of Maritime Law and Commerce* 9 (April 1978), pp. 185-224 at p. 194.

²⁹ For an excellent discussion of state positions during both the 1973 and 1978 conferences, see M'Gonigle and Zacher, *Pollution, Politics, and International Law*, pp. 107-42.

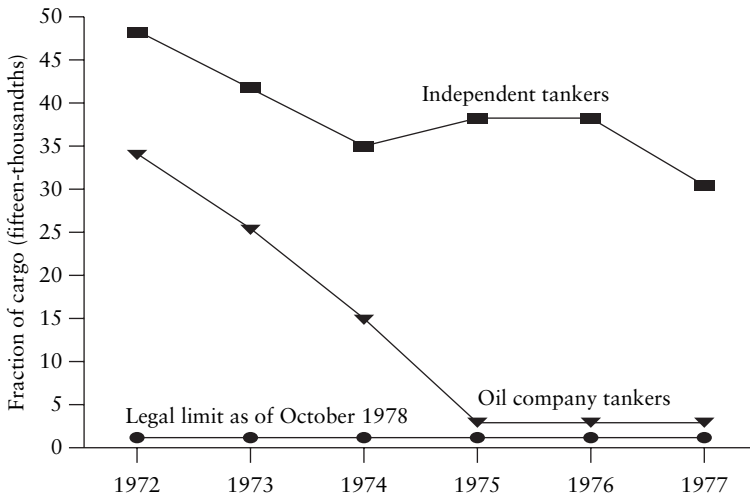


FIGURE 25.1. Average tanker discharges, 1972-77.

Source: U.S. Congress, House Committee on Government Operations, *Oil Tanker Pollution: Hearings Before the Subcommittee on Government Activities and Transportation, 18 and 19 July 1978*, 95th Congress, 2d sess., p. 322.

dramatically reduced average discharges in the early 1970s, discharges remained at three times the legal limit. The two-thirds of the fleet operated by independent oil transporters did far worse, with discharges that were thirty times the legal limit and that were not much below levels that a tanker practicing no pollution control would have produced.³⁰ The trends in these discharges suggest that few tankers complied with the limit after it took legal effect in 1978.³¹

Other evidence confirms the frequency of discharge violations. [National Academy of Sciences studies conducted in 1981 and 1989 assumed that significant fractions (50 percent and 15-20 percent, respectively) of the world's tanker fleet were violating the total discharge limit.³²] Representatives of independent transporters [admitted] that tankers often

³⁰ See, for example, the estimate of 0.3 percent in James E. Moss, *Character and Control of Sea Pollution by Oil* (Washington, D.C.: American Petroleum Institute, 1963), p. 47, and the estimate of 0.4 percent in IMCO/IMO doc. OP 1/21, 15 January 1965, of the Oil Pollution subcommittee. (Using note 30 as a guide, this indicates the only document issued relating to agenda item 21 at the 1st meeting of the subcommittee.)

³¹ Unfortunately, oil companies discontinued the surveys after 1977. Personal communication from Arthur McKenzie, Tanker Advisory Center, New York, 1992.

³² [IMCO/IMO doc. MEPC XVI/Inf.2, 4 November 1981. IMCO/IMO doc. MEPC 30/Inf.13, 19 September 1990, p. 15.]

violate discharge limits ***.³³ Studies of detected oil slicks and dead seabirds as well as [IMO violation reports] confirm that many tankers continue to discharge their slops at sea.³⁴

[By contrast there is considerable evidence] that compliance with the equipment standards has been exceptionally high. By 1981, *** new tankers were being built with SBT and existing tankers were being retrofitted with SBT and/or COW.³⁵ [National] and international studies and industry experts [assume] that all tankers comply with the equipment standards ***.³⁶

Analysis of previously unavailable data on equipment installed on large tankers supports these perceptions.³⁷ Among large tankers in the fleet at the end of 1991, 94 percent of tankers built in 1979 or earlier had installed SBT or COW as required, 98 percent of those built between 1980 and 1982 had installed SBT as required, and 98 percent of those built after 1982 had installed both SBT and COW as required. The figures not only confirm remarkably high compliance rates but also document that tankers of all nations, not merely those that supported the equipment requirements during negotiation, have complied.

³³ For example, "IMO, Tanker Owners Urge Increase in Facilities Accepting Oily Wastes," *International Environment Reporter*, 8 March 1989, p. 130.

³⁴ See, for example, C. J. Camphuysen, *Beached Bird Surveys in the Netherlands 1915-1988: Seabird Mortality in the Southern North Sea Since the Early Days of Oil Pollution* (Amsterdam: Werkgroep Noordzee, 1989); United States Coast Guard, *Polluting Incidents In and Around U.S. Waters* (Washington, D.C.: U.S. Department of Commerce, 1973 and 1975-86); N. Smit-Kroes, *Harmonisatie Noordzeebeleid: Brief van de Minister van Verkeer en Waterstaat* (Tweede Kamer der Staten-Generaal: 17-408) (Harmonization of North Sea policy: Letter from the Minister of Transport and Waterways; Lower House of Parliament) (The Hague: Government Printing Office of the Netherlands, 1988); IMCO/IMO doc. MEPC 21/Inf. 8, 21 March 1985; and Second International Conference on the Protection of the North Sea, *Quality Status of the North Sea: A Report by the Scientific and Technical Working Group* (London: Her Majesty's Stationery Office, 1987), p. 14.

³⁵ Drewry Shipping Consultants, Ltd., *The Impact of New Tanker Regulations*, Drewry publication no. 94 (London: Drewry Shipping Consultants, Ltd., 1981), p. 25.

³⁶ See IMCO/IMO doc. MEPC 30/Inf.13, 19 September 1990, p. 8; Second International Conference on the Protection of the North Sea, *Quality Status of the North Sea*, p. 57; Pieter Bergmeijer, "The International Convention for the Prevention of Pollution from Ships," paper presented at the 17th Pacem in Maribus conference, Rotterdam, August 1990, p. 12; and personal interview with E. J. M. Ball, Oil Companies International Marine Forum, London, 26 June 1991;

³⁷ The detailed statistics in Table 1 and Figure 2 were developed from an electronic version of Clarkson Research Studies, Ltd., *The Tanker Register* (London: Clarkson Research Studies, Ltd., 1991) generously provided by Clarkson Research Studies, Ltd.

[Both] international politics and private economics would lead us to expect higher compliance with the discharge standards, not the equipment standards. The discharge standards had been adopted unanimously. In contrast, several powerful nations opposed the equipment standards in both 1973 and 1978. Tankers seeking the economic benefits of conserving oil could have done so most cheaply by using the equipment-free option of LOT, not by installing COW or the even more expensive SBT. Indeed, in 1978, one analyst *** predicted that the enormous costs of SBT would make compliance “negligible.”³⁸

In short, the empirical evidence of higher compliance levels with the equipment subregime runs contrary to predictions based on a simple analysis of exogenous power and interests. How do we explain what appears to be a significant divergence between theory and observed outcomes? Was any of the observed compliance treaty-induced? If so, what elements of the equipment standards compliance system explain its greater success at eliciting compliance? ***

WAS COMPLIANCE TREATY-INDUCED?

[Before explaining these differences in compliance levels, we need to ensure they can be attributed to features of the subregimes.] *** Did tanker owners and operators act any differently than they would have in the absence of international regulations? The following accounting strongly suggests (1) that increased use of LOT owes more to economics than to international law, (2) that increased installation of COW equipment owes much to economics but also reflects the MARPOL regime’s influences, and (3) that increased installation of SBT largely is due to MARPOL influences.

LOT

[The] 1969 rules had little to do with the observed increase in the use of LOT by tanker operators. A large share of tankers simply did not use LOT or comply with the discharge standards. The continuing noncompliance with discharge standards did not result from an inability to use

³⁸ Charles Odidi Okidi, *Regional Control of Ocean Pollution: Legal and Institutional Problems and Prospects* (Alphen aan den Rijn, The Netherlands: Sijthoff and Noordhoff, 1978), p. 34.

LOT – a noncomplex procedure that required no new equipment – but from insufficient incentives to use it.

The subregime itself produced few effective mechanisms for inducing operators to adopt LOT. [The] discharge subregime's compliance system failed to induce the monitoring and enforcement necessary to deter violations. The subregime's failure effectively to detect, identify, prosecute, and penalize violators left tanker operators' incentives to comply with it largely uninfluenced. ***

Given the absence of these pathways for regime influence, it is not surprising to find that economic influences readily explain the pattern of LOT usage. A tanker operator's first-order incentives to use LOT depended on the costs of recovering waste oil, the value of that oil, and the ownership of the oil being transported. This last factor meant that oil companies had far greater incentives to adopt LOT than did independent transporters. The latter carry oil on charter to cargo owners and are paid for the amount of oil initially loaded, *** not for the amount delivered. Therefore, discharging waste oil at sea costs the independent transporter nothing. *** In contrast, operators that own their cargoes, as oil companies usually do[, could benefit by almost \$15,000 per trip.³⁹]

The decrease in average discharges of oil company tankers in the 1970s and the absence of a similar decrease in discharges of independent tankers correlate more with these divergent incentives and with rising oil prices than with any treaty proscription. Oil companies' greater incentives to conserve oil explain why their average discharges were lower than those of independent tankers in 1972 and why they decreased discharges more rapidly after the 1973 oil price hikes (see Figure 25.1). If the regime *** were influencing oil company behavior, these decreases should have occurred only after the total discharge limits took legal effect in 1978 ***. The far smaller decrease in average discharge among independents reflects the fact that conserved oil had little value to them.

* * *

COW

The almost universal installation of COW equipment initially tempts one to conclude that compliance was treaty-induced. The contrast in rates

³⁹ The following discussion of the costs of LOT, COW, and SBT draws heavily on William G. Waters, Trevor D. Heaver, and T. Verrier, *Oil Pollution from Tanker Operations: Causes, Costs, Controls* (Vancouver, B.C.: Center for Transportation Studies, 1980).

of use of LOT and COW suggest that differences in the designs of the corresponding subregimes may be responsible, given that both methods allowed a tanker operator to reduce waste oil. However, closer evaluation reveals that here, too, economic factors played an important role, although not an exclusive one.

Like LOT, COW has economic as well as environmental benefits. COW's costs include those for the washing machines and the additional time and labor needed to wash tanks in port ***. As with LOT, the offsetting benefit of more delivered cargo accrues to the cargo owner. However, the tanker operator also benefits: the decrease in oil left onboard increases the tanker's effective cargo capacity and reduces [repair and maintenance costs. Saving about \$9,000 per voyage.]

These economic incentives to adopt COW are [evident in the timing of its adoption.] *** [Many oil companies adopted cow in the mid-1970s, years after it became available but before the MARPOL deadline. Like LOT, this timing corresponds with the rising oil prices of the 1970s.]

The contrast to SBT *** also confirms the role of economics. The higher capital costs of SBT and the significant reduction to cargo-carrying capacity that SBT involved imposed a net cost per voyage on a tanker with SBT of \$1,500 ***. A new tanker installing both COW and SBT, as required by MARPOL, faced costs of almost \$8,000 per voyage. Owners of large tankers built before 1980, who were allowed to choose between SBT and COW, installed COW equipment on 89 percent of their tankers and SBT on only 36 percent. Owners also installed COW equipment on 95 percent of large tankers built between 1980 and 1982, even though MARPOL only required them to install SBT. ***

[If economics were the sole influence on behavior, however, we should expect companies to achieve the economic goal of conserving oil by the cheapest and most cost-effective means possible, that is, by LOT, not COW.] We should also expect to see the same divergence between the behavior of independent carriers and oil companies as we observed in the LOT case. Yet the 99 percent compliance rate attests to the fact that all tanker owners were installing COW. The adoption of COW more frequently than SBT does not imply that the subregime was ineffective, only that when the subregime left owners with alternatives, their choices were driven by costs. In contrast to clear flaws in the compliance system supporting discharge standards, *** the design of the compliance system supporting equipment requirements provided several means of successfully reducing both the incentives and ability of tanker owners to violate COW requirements. Thus, an interplay among economics and subregime

characteristics appears to have been the source of widespread COW adoption.

SBT

Adoption of the SBT standard provides an unambiguous example of subregime influence on behavior. Unlike COW or LOT, tanker owners had no economic incentives to install this technology. SBT's additional piping and equipment added several million dollars to the cost of a new tanker, representing almost 5 percent of total cost.⁴⁰ Installing SBT also reduced cargo capacity ***. Yet these costs provided no offsetting benefits ***. [Supporters of SBT admitted that SBT would increase the cost of carrying oil by 15 percent;] some oil company estimates ran up to 50 percent.⁴¹ As late as 1991, oil and shipping interests opposed mandatory SBT retrofitting as too expensive.⁴²

[Observed SBT installations reflect effective treaty rules rather than economics.] [More] than 98 percent of those required to install SBT did so despite the significant costs involved. *** [The timing of the increase in the number of tankers installing SBT seen in Figure 25.2 reinforces the conclusion that owners installed SBT only under the regulatory threat posed by the subregime's compliance system.] In short, ["If there were not a regulatory requirement, there would not be SBT."⁴³] Within several years, the subregime had caused a radical change in tanker owner behavior.

One alternative explanation of SBT adoption deserves special attention. At least one analyst has claimed that hegemonic pressures exerted by the United States explain the success of MARPOL.⁴⁴ [Certainly SBT requirements were adopted because of explicit threats of unilateral U.S. regulation. Yet, this does not imply that subsequent behaviors results

⁴⁰ See Philip A. Cummins, Dennis E. Logue, Robert D. Tollison, and Thomas D. Willett, "Oil Tanker Pollution Control: Design Criteria Versus Effective Liability Assessment," *Journal of Maritime Law and Commerce* 7 (October 1975), pp. 181-82; and Charles S. Pearson, *International Marine Environmental Policy: The Economic Dimension* (Baltimore, Md.: The Johns Hopkins University Press, 1975), p. 98.

⁴¹ See IMCO/IMO doc. MEPC V/Inf. 4, 8 March 1976, p. A18; and M'Gonigle and Zacher, *Pollution, Politics, and International Law*, p. 134.

⁴² See IMCO/IMO doc. MEPC 31/8/5, 4 April 1991; and Osborne and Ferguson, "Technology, MARPOL, and Tankers," p. 6-2.

⁴³ Personal interview with Sean Connaughton, marine transportation analyst, American Petroleum Institute Washington, D.C., 8 April 1992.

⁴⁴ Jesper Grolin, "Environmental Hegemony, Maritime Community, and the Problem of Oil Tanker Pollution in Michael A. Morris, ed., *North-South Perspectives on Marine Policy* (Boulder, Colo.: Westview Press, 1988).

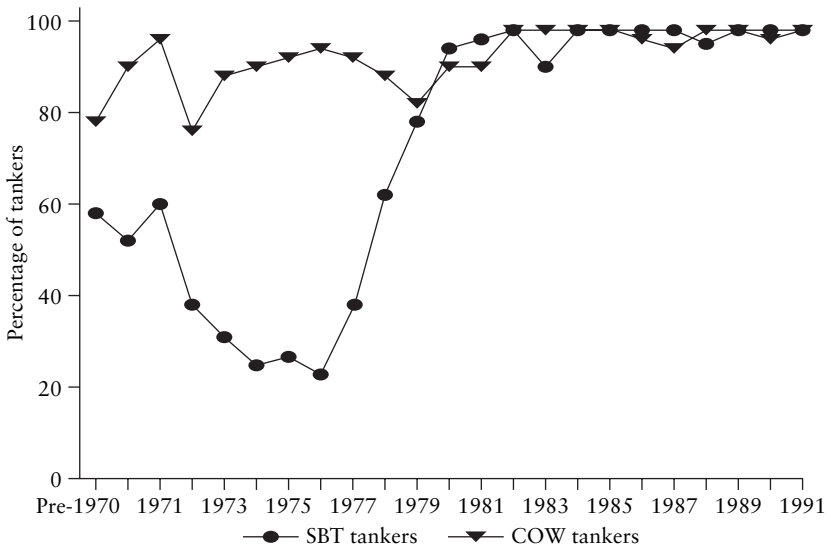


FIGURE 25.2. Percentage of tankers with segregated ballast tanks (SBT) and/or crude oil washing equipment (COW) onboard in 1991, by year of tanker construction.

Source: Electronic version of Clarkson Research Studies, Ltd., *The Tanker Register* (London: Clarkson Research Studies, Ltd., 1991), provided to the author.

from that same pressure.] The relevant question is, “Could the United States, through unilateral measures, have induced so many tanker owners to install SBT?” Available evidence suggests not.

While the United States wields tremendous diplomatic leverage, it wields nothing near hegemonic power in oil transportation markets. Since the United States became concerned about oil pollution in the late 1960s, it has been responsible for less than 5 percent of new tankers built, less than 7 percent of tanker registrations, and less than 20 percent of world oil imports.⁴⁵ Given SBT’s high costs, oil transportation companies would have been more likely to respond to unilateral U.S. equipment requirements by installing SBT on a sufficient number of tankers to service the U.S. market than by installing it on all tankers. *** Indeed, in terms of power to control oil tankers, Japan – which opposed SBT

⁴⁵ See Lloyd’s Register of Shipping, *Annual Summary of Merchant Ships Completed* (London: Lloyd’s Register of Shipping, various years); Lloyd’s Register of Shipping, *Statistical Tables* (London: Lloyd’s Register of Shipping, various years); and United Nations, *Statistical Yearbook* (New York: United Nations, various years).