

---

## Intentional Oil Pollution of the Oceans

Ronald Mitchell

Mention oil pollution and most people conjure up images of accidents like the *Exxon Valdez*.<sup>1</sup> Yet the intentional discharge of oil during tanker operations has consistently overshadowed accidents as the major source of the ship-related oil pollution that soils beaches and oils sea-birds (see table 5.1).<sup>2</sup> Indeed, for more than six decades, nations have sought international regulations to address this problem. Yet only in the last decade and a half has oil entering the ocean from tanker operations begun to decrease. This raises two questions. First, can we attribute recent progress in reducing oil pollution to these international efforts? Second, if so, what components of these efforts account for their success?

This chapter answers these questions by arguing that international regulations to control intentional discharges of oil at sea have had re-

I am grateful for research funding to the Center for International Affairs, the Harvard MacArthur Scholarships in International Security, and the Eisenhower World Affairs Institute. I am also grateful for travel funding provided through the Center for International Affairs by the Delegation of the Commission of the European Communities, and by the Rockefeller Brothers Fund. Personnel at the International Maritime Organization and the U.S. Coast Guard provided me with invaluable assistance. I would like to thank Antonia Chayes, Gail Osherenko, Oran Young, Mark Zacher, and the authors and editors of this volume for helpful comments on previous drafts of this paper. The work was conducted at the Center for International Affairs, Harvard University.

1. The *Exxon Valdez* spilled 35,000 tons of oil into Prince William Sound, Alaska on 24 March 1989.

2. See National Academy of Sciences, *Petroleum in the Marine Environment* (Washington, D.C.: National Academy of Sciences, 1975); National Academy of Sciences and National Research Council, *Oil in the Sea: Inputs, Fates and Effects* (Washington, D.C.: National Academy Press, 1985); and MEPC 30/INF.13 (19 September, 1990) (All subsequent document citations refer to IMCO documents.)

cent, if limited, success. Success has depended on strong concern and pressure from the United States supported by increased concern among other countries. By providing an ongoing diplomatic forum, however, the Inter-Governmental Maritime Consultative Organization (IMCO) and its successor the International Maritime Organization (IMO) have, since the 1970s, facilitated the transformation of this concern into global agreements and has established effective equipment standards that have removed practical and legal barriers that impeded enforcement of earlier agreements. Expert assessments suggest that oil discharges have decreased even after accounting for a simultaneous reduction in sea-borne oil trade, and, while oil price increases have caused some of the reduced discharge levels, the price increases do not explain the techniques adopted by industry (see figures 5.1 through 5.3).<sup>3</sup> To fully explain recent progress, we must acknowledge the role of international conventions in 1973 and 1978 which supplemented essentially un-

3. Sources for figure 5.1: David W. Abecassis, *The Law and Practice Relating to Oil Pollution from Ships* (London: Butterworth and Co., 1978); G. Boos, "Revision of the International Convention on Oil Pollution," in *International Conference on Oil Pollution of the Sea*, (Rome, 1968); GESAMP (IMCO/FAO/UNESCO/WMO/WHO/IAEA/UN Joint Group of Experts on the Scientific Aspects of Marine Pollution), *Impact of Oil on the Marine Environment* (Rome: Food and Agriculture Organization, 1977); International Conference on Pollution of the Sea by Oil, "General Committee: Minutes of 5th Meeting Held on 5 May 1954" (1954); J. H. Kirby, "The Clean Seas Code: A Practical Cure of Operational Pollution," in *International Conference on Oil Pollution of the Sea* (Rome, 1968); MEPC 30/INF.13; Arthur McKenzie, "Letter to the Honorable John L. Burton," in House Committee on Government Operations, *Oil Tanker Pollution—Hearings*, 95th Congress, 2nd session, House 401-8 (Washington, D.C.: GPO, 1978); James E. Moss, "Character and Control of Sea Pollution by Oil" (Washington, D.C.: American Petroleum Institute, 1963); National Academy of Sciences, *Petroleum in the Marine Environment* (Washington, D.C.: National Academy of Sciences, 1975); National Academy of Sciences, and National Research Council, *Oil in the Sea*; J. D. Porricelli, V. F. Keith, and R. L. Storch, *Tankers and the Ecology* (New York, N.Y.: Society of Naval Architects and Marine Engineers, 1971); Sonia Zaide Pritchard, "Load on Top: From the Sublime to the Absurd," *Journal of Maritime Law and Commerce* 9 (1978); Y. Sasamura, *Petroleum in the Marine Environment: Inputs of Petroleum Hydrocarbon Into the Ocean Due to Marine Transportation Activities* (London: IMCO, 1981); Study of Critical Environmental Problems, *Man's Impact on the Global Environment: Assessment and Recommendations for Action* (Cambridge, Mass.: The MIT Press, 1970); J. Wardley-Smith, ed., *The Control of Oil Pollution*, rev. ed. (London: Graham and Trotman Publishers, 1983). Source for figure 5.2: Gilbert Jenkins, *Oil Economists' Handbook* (New York, N.Y.: Applied Science Publishers, 1990).

enforceable performance standards—limiting where and how tankers could discharge oil—with easy-to-verify equipment standards that required installation of equipment that eliminated the need for such discharges. Compliance with these rules, rather than economic factors, explain why so many tanker owners have so quickly adopted certain expensive, in some cases non-cost-effective, oil retention technologies. Unfortunately, while international rules have changed industry behavior, they have had little influence on government behavior. In addition, the extended phase-in period for equipment requirements, continued illegal discharges by some tankers, and the lack of successful control of land-based sources of oil most likely account for the continuing environmental damage by oil to birds and beaches.

Even this limited success is not strictly due to the institution, how-

Table 5.1 Input of oil into the sea

	Year of estimate:		
	1971	1980	1989
	(million metric tonnes per year)		
Transportation			
Tanker operations	1.080	0.700	0.159
Dry-docking	0.250	0.030	0.004
Terminal operations	0.003	0.020	0.030
Bilge and fuel oils	0.500	0.300	0.253
Accidents	0.300	0.420	0.121
Scrappings	No est.	No est.	0.003
Combination carriers			
Subtotal	2.133	1.470	0.569
Offshore production	0.080	0.050	No est.
Municipal and industrial wastes and runoff	2.700	1.180	No est.
Natural sources	0.600	0.250	No est.
Atmosphere-emissions fallout	0.600	0.300	No est.
Total	6.113	3.250	0.569
Discharges from tanker operations	1.080	0.700	0.159
Crude traded (mta)	1100.0	1319.3	1097.0
Discharges as percent of crude trade	0.0982%	0.0531%	0.0145%

Sources: National Academy of Sciences, 1975, 1985, 1990.

ever. These rule changes depended on deeper changes in the interests of the governments negotiating the agreements. Efforts to control discharges failed for decades because concern over the problem was neither sufficiently strong nor widespread. While they might have, international efforts have not played a major role in increasing understanding or concern over the oil pollution problem. Support for strong rules required changes in three factors. First, growing environmentalism led the U.S. government to champion more stringent measures than had previously been considered, backing their proposals with threats of unilateral action. Second, European states increased their support for strong measures in the face of similar public concern evoked by several major tanker accidents. Third, the many developing countries who joined IMO in the early 1970s supported these measures, either out of environmental concern or to increase jurisdictional power in the linked Law of the Sea negotiations. Only this combination of factors allowed concerned governments to overcome the resistance of the oil and shipping interests, and the maritime governments which supported them, to get agreement on the expensive but effective equipment requirements necessary to reduce intentional discharges.

This chapter examines the various efforts to achieve international regulation of operational, or intentional, oil pollution.<sup>4</sup> While many analysts essentially ignore the “unsuccessful” efforts before 1973,<sup>5</sup> this author reviews the various attempts at regulation beginning with those made in the 1920s and extending through the most recent amendments, in order to better demonstrate the conditions that explain why oil pollution control has succeeded or failed. The chapter begins by describing the intentional oil pollution problem. It delineates the actors involved in the bargaining over international oil pollution control and describes how changes to their interests and power have altered the nature of the

4. I will use the terms intentional discharges and operational discharges interchangeably. The point is to distinguish them from accidental oil spills.

5. For example, see Jeff B. Curtis, “Vessel-source Oil Pollution and MARPOL 73/78: An International Success Story?” *Environmental Law* 15 (Summer 1985); and Alan B. Sielen and Robert J. McManus, “IMCO and the Politics of Ship Pollution,” in David A. Kay and Harold K. Jacobson, eds., *Environmental Protection: The International Dimension*, (Totowa, N. J.: Allanheld, Osmun & Co., 1983).

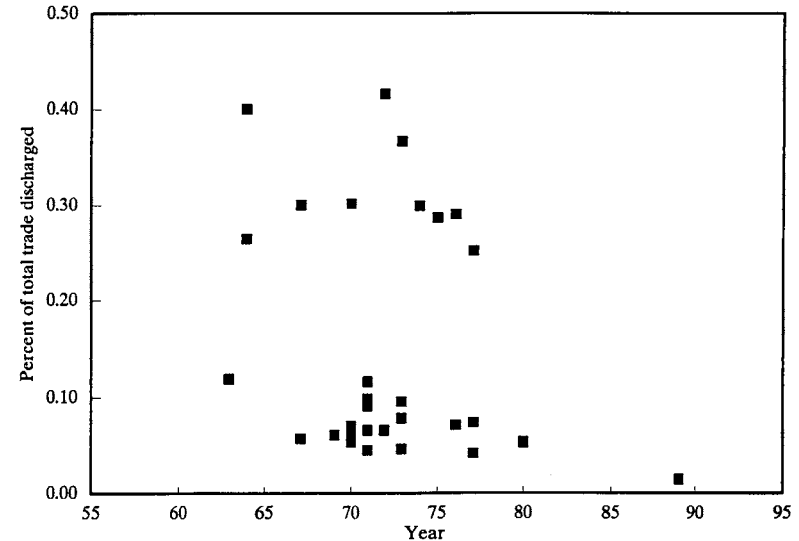


Figure 5.1  
Discharge as percent of crude trade  
Sources: various (see note 3).

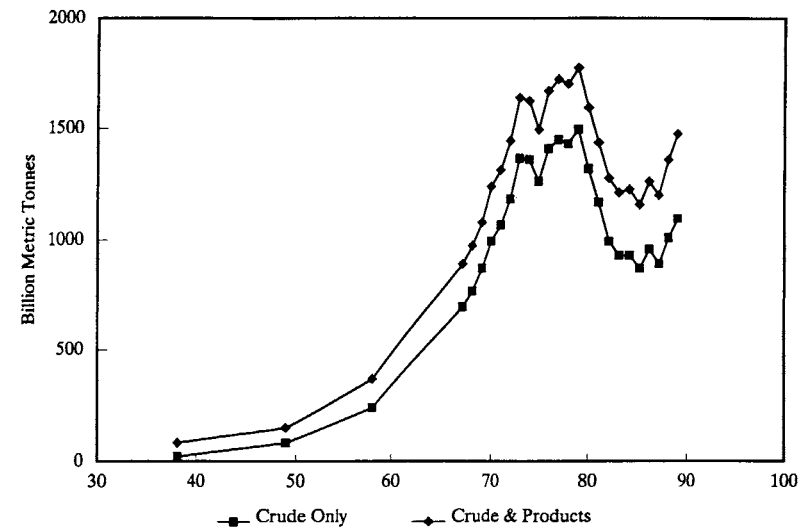


Figure 5.2  
World seaborne trade  
Source: BP Statistical Review.

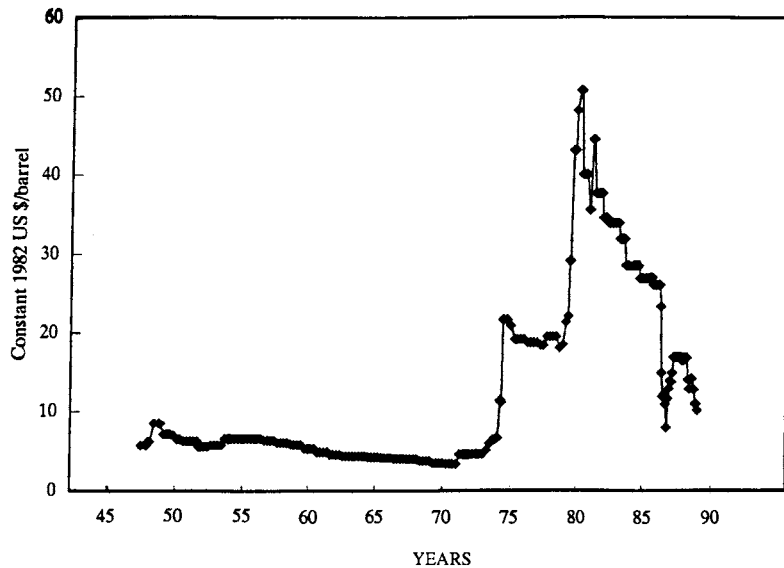


Figure 5.3  
World crude oil prices  
Source: *Oil Economists' Handbook*, 1990.

international bargain over time. I then describe the history of international oil pollution control by breaking it into three periods: the 1920s until 1954, during which efforts failed to produce signed agreements; 1954 through 1967, during which signed agreements failed to change industry behavior; and 1967 through the present, during which intentional discharges have begun to decrease. This history develops the evidence for the subsequent analysis of agenda setting for, international policies on, and industrial and national policy responses to, intentional oil pollution regulation. This section is followed by conclusions regarding the overall effectiveness of international oil pollution control and some lessons for other international environmental institutions.

Intentional oil pollution arises from deliberate discharge into the ocean of oil-water mixtures produced during three processes of oil transport. First, tankers have historically filled cargo tanks with sea water ballast to remain seaworthy when returning from a delivery. Second, tankers often used water to clean their tanks before receiving

more oil. Third, oil and lubricants leak into all ships' bilges and mix with seawater. Captains have traditionally discharged the oil-water mixtures from all three processes at sea prior to arrival in port. These discharges are not essential to the oil transportation process, but arise because the cost of recovering the oil exceeds the value of the oil recovered.

Historically, these procedures have put close to a million tons of oil into the world's oceans each year. They represent 60 to 70 percent of all ship-generated oil pollution, with accidents and non-tankers making up the rest. But ship-generated oil represents only a third of all oil entering the oceans, with the rest due to land-based sources, natural seeps, and offshore production. Thus, operational discharges are responsible for only some 20 percent of all ocean oil pollution. These discharges, while they do not persist indefinitely, as believed by the United States and Britain in the 1920s, can remain afloat over long distances. Indeed, the maximum distance that oil can travel before evaporating or being broken down by bacteria depends on numerous factors, and has never been conclusively determined. The inherently international nature of the oil transportation market and the fact that a single tanker can discharge oil that pollutes the resorts and kills the seabirds of numerous countries, has produced frequent calls for international regulation.

Three solutions to the problem have been considered: banning oil-water discharges in zones close to shore, banning oil-water discharges oceanwide, and requiring equipment which reduced the oil-water mixtures created. Zones of 50 to 100 miles inside of which discharges were prohibited by early agreements have reflected low levels of concern rather than scientific assessments of the distance beyond which discharges would not cause coastal pollution. Leader states, like the United Kingdom, saw zones as an ineffective but acceptable initial compromise to demonstrate international commitment to action and to start a process, while states unconcerned about pollution accepted zones to avert activist states from unilaterally creating a patchwork of rules impairing their ships' involvement in oil transportation markets. The subsequent adoption of oceanwide bans and equipment requirements reflected the recognition that, at least in some circumstances, discharges made outside 50- to 100-mile zones could still harm the coastal environment.

### Domestic Concern and International Bargains

An international environmental problem consists not only of an environmental harm, but also of the political barriers to its mitigation. Thus, before examining the history of international efforts to regulate oil pollution, it will help to examine the factors influencing the interests of parties to the international bargain and the obstacles that impeded the growth of international concern. Effectively, international negotiations have involved an ongoing three-way bargain between national governments, their domestic publics and environmental nongovernmental organizations (NGOs), and the international oil and shipping industries. It has been a negotiation between people concerned about the effects on birds and resorts of coastal oil pollution, the maritime and oil interests for whom discharging oil at sea was cheaper than alternatives, and the governments mediating between these two groups.

What obstacles, prior to the 1970s, prevented the international bargain necessary to successfully eliminate coastal oil pollution? The largest impediment has been an absence of sufficient concern, indeed an absence of a perception that a bargain needed to be struck. It has not been insufficient knowledge of oil's impacts or uncertainty regarding the sources of the oil. The primary impacts of oil that drive public concern—dead seabirds and oiled beaches—have always been highly visible and scientists have found no evidence that oil spills “have unalterably changed the world's oceans or marine resources,” which, if found, might have provided the impetus for quick and dramatic international action.<sup>6</sup> There has also been little contention over the major con-

6. National Academy of Sciences, and National Research Council, *Oil in the Sea*, 489. Even major accidental pollution from oil spills seems to have only limited, nonpermanent environmental effects. As a 1990 study noted, oil “continues to be a matter of concern locally after accidents have released large amounts of oil that accumulate in sheltered areas, affecting amenity and living resources, especially bird life. While the damage is not irreversible, recovery can be slow”; GESAMP (IMO/FAO/UNESCO/WMO/WHO/IAEA/UN/ UNEP Joint Group of Experts on the Scientific Aspects of Marine Pollution), *The State of the Marine Environment* (New York, N.Y.: United Nations, 1990), 2. For other examples, see Second International Conference on the Protection of the North Sea, *Quality Status of the North Sea* (London: Her Majesty's Stationery Office, 1987), 72–73; United Kingdom, Royal Commission On Environmental Pollution, *Eighth Report: Oil Pollution of the Sea* (London: Her Majesty's Stationery

tribution of intentional discharges to coastal oil pollution. Nations have neither lacked the capacity to adopt, nor been ignorant of, techniques and technologies which could immediately and effectively have eliminated the problem. States have also not found it difficult to make agreements; indeed, states have regularly drafted agreements to control oil pollution since the 1920s. Rather, the major obstacle until the 1970s to the strong international action needed to eliminate coastal oil pollution has been a lack of adequate concern—a lack of widespread concern in the majority of states and a lack of sufficiently deep concern in powerful states—to lead to their proposing strong action and pressuring reluctant states to support them.

At least three obstacles have hindered development of the international concern necessary for strong international action.<sup>7</sup> The first has been lack of concern among domestic publics. In the United Kingdom from the 1920s to the 1960s, bird protection societies pressed the government for regulations to halt coastal pollution. In the United States, environmentalist groups in both the 1920s and the 1970s conducted letter-writing and lobbying campaigns to raise the salience of the issue. After the 1967 *Torrey Canyon* disaster, growing tanker traffic due to increased imports, widespread media coverage of oil tanker accidents, and increased environmentalism also helped strengthen public concern and calls for international action in Europe and the United States. In contrast, states with little oil pollution, like Germany and the Netherlands during the 1920s, and developing states more recently, have shown little interest in international action except if it protected the access of domestic shipping interests to the U.S. market. Essentially, until the 1970s, most governments did not feel an oil pollution problem existed that needed an international solution.

A second obstacle has been that, even when domestic calls for action

Office, 1981), 38, 46–49, 266; and J. M. Baker, *Impact of Oil Pollution on Living Resources* (Gland, Switzerland: International Union for Conservation of Nature and Natural Resources, 1983), 40.

7. The following discussions draw extensively on Sonia Zaide Pritchard, *Oil Pollution Control* (London: Croom Helm, 1987); United Kingdom Ministry of Transport, *Report of the Committee on the Prevention of Pollution of the Sea by Oil* (London: Her Majesty's Stationery Office, 1953); and R. Michael M'Gonigle and Mark W. Zacher, *Pollution, Politics, and International Law: Tankers at Sea* (Berkeley: University of California Press, 1979).

have been loud, a government's international support for strong measures depended on the level of opposition from domestic oil and shipping concerns.<sup>8</sup> Oil companies have initially resisted any regulation, but have supported international negotiation to avert the competitive disadvantage inherent in unilateral regulation while simultaneously weakening the stringency of regulation. In the 1950s and 1960s, cross-cutting pressures meant that an international conference allowed Britain to placate environmental critics while using the resistance of other states to achieve less stringent internationally agreed rules that would be more palatable to domestic industry than unilateral laws.<sup>9</sup> Likewise, the French and Danish had reported serious coastal pollution as early as the 1950s but opposed the 1973 SBT requirements out of deference to their shipping industries concern at the expense involved and their shipbuilding industries concern that tanker buyers would defer new orders.<sup>10</sup> However, by the 1950s, enough states had domestic pollution concerns that they felt the necessity to take some initial international steps and that they could convince oil and shipping interests, and the states representing them, to accept some no-cost pollution controls to avoid patchwork unilateral legislation. However, when efforts to impose real costs on industry began to emerge in 1962, the industry quickly showed its power both to ignore existing regulations and to demand less costly rules.

The third obstacle to effective international regulation has been the difficulty of developing a coalition of states willing to support strong international action. Increased concern in the 1970s in part reflected a much larger problem: even if each tanker discharged a smaller fraction of cargo than previously, the problem would have increased as seaborne

8. Oil is shipped by sea in tankers owned by oil companies and in tankers owned by independent shipping companies from which oil companies charter. The interests of the shipping and oil industries frequently converge with respect to oil pollution regulations. However, the larger size and higher visibility of oil companies makes them more susceptible to public political pressure than small (sometimes single-ship) independent companies.

9. Pritchard, *Oil Pollution Control*, 75. See also U.K. Ministry of Transport, *Report of the Committee*, 37.

10. See United Nations Secretariat, *Pollution of the Sea by Oil* (New York, N.Y.: United Nations, 1956); and IMCO, *Pollution of the Sea by Oil* (London: IMCO, 1964) for state positions regarding oil pollution during the 1950s and 1960s. See also M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 86, 90, 114.

oil trade went from 84 million tons per year in 1938, to 264 in 1954, to 1695 in 1973. Through a combination of policy compromise and diplomatic pressures, the United Kingdom in 1954 and 1962, and the United States in 1973 and 1978, succeeded in building coalitions willing to support international controls. Only in 1973 and 1978, however, was concern deep enough in the activist state, and sufficiently widespread in other countries, that nations agreed to effective international rules. Under environmentalist pressures at home, the United States threatened strong unilateral action if other states did not agree to international regulation. While it made compromises to its initial stringent proposals, these nonetheless pushed many states well beyond what they would have legislated on their own. The ranks of IMCO willing to support effective oil pollution control had also swelled to include new developing countries, many of whom had little domestic experience of, or concern over, oil pollution, but supported strong controls because they expected few direct costs from such regulation and hoped that pollution control would help establish jurisdictional precedents favorable to their interests in the Law of the Sea negotiations. Developed states lacking strong oil and shipping interests, like Canada, Australia, and New Zealand, also took environmentalist positions and supported the U.S. proposals. By 1973, these changes provided the votes needed to counter the power of maritime states and industry and pass international regulations that began to require real national and industrial policy responses.<sup>11</sup> While the shift took more than overnight, the political bargain was no longer weighted exclusively in favor of shipping interests. If, prior to the 1970s, industry had always dictated oil pollution policy, they now had to negotiate it.

### The History of International Regulation

#### Unsigned Agreements: 1920–1954<sup>12</sup>

**The 1926 Draft Convention** Oil pollution first became a problem in the 1920s, as ships began to use oil and gas, rather than coal, as fuels.

11. See M'Gonigle and Zacher, *Pollution, Politics, and International Law*, especially chapters 4 and 5, for an extended discussion of the changes in political bargaining at IMCO between 1954 and 1978.

12. This section draws heavily on Pritchard's detailed account of the early years of oil pollution regulation in her book *Oil Pollution Control*.

During the 1920s and 1930s most oil pollution came from the discharge of oil from the bilge and fuel tanks of such ships.<sup>13</sup> In the 1920s, the Royal Society for the Protection of Birds in the United Kingdom and the National Coast Anti-Pollution League in the United States lobbied legislators to regulate the increasing discharges evidenced in the growing numbers of oiled birds and soiled beaches.<sup>14</sup> Politicians also heard complaints from resorts and tourists, local authorities responsible for beach and harbor cleanup, and fire underwriters paying for fires in ports.<sup>15</sup> While oil pollution was not provoking widespread public concern, NGOs were vocal enough in the United States and United Kingdom to get the attention of governmental and industrial interests.<sup>16</sup>

Lobbied by such groups, many nations unilaterally restricted ship discharges near their ports. The United Kingdom passed the Oil in Navigable Waters Act in 1922, the United States passed the Oil Pollution Act of 1924, and other countries passed similar legislation.<sup>17</sup> The U.S. and British laws banned oil discharges within their three-mile territorial waters. It was these two main shipping countries that drove most international action on oil pollution. The U.S. governmental committee formed to investigate the oil pollution problem worked closely with the British government to develop practical, economical solutions before calling an international conference on oil pollution.<sup>18</sup>

The United States convened the conference in 1926 with the goal of eliminating intentional discharges of oil. Delegates from thirteen countries attended. While most nations faced no significant oil pollution problems at home, agreement would avert diverse unilateral rules, especially growing claims of extended territorial seas with their implications far beyond the issue of oil pollution.<sup>19</sup> As discussed above, positions reflected the interplay of shipping and environmental concerns as well

as scientific perceptions of the problem. "The U.K., the U.S., Germany and the Netherlands were big shipping nations, but whereas Germany and the Netherlands had relatively short coasts, both the U.K. and the U.S. had long coasts which were exposed to oil pollution."<sup>20</sup> International action also held the promise of averting more stringent regulations which would harm shipping (especially British shipping) while quieting domestic environmental pressures.<sup>21</sup>

During the conference, a significant scientific debate arose over how long oil persisted in the ocean. The Dutch and Germans contended that biological processes eliminated oil quickly. The United States, United Kingdom, and Canada believed that crude, fuel and diesel oils persisted indefinitely. Thus, the United States sought to require that all oil-water mixtures be kept on board using expensive separators and then discharged into reception facilities in port. Given the resistance of other states to such measures, the conference debate turned to interim measures involving zones within which discharges would be restricted. While the United States proposed 500-mile zones, the final draft convention established 50-mile coastal zones within which discharges over 500 parts of oil per million parts of water (ppm) would be prohibited. A chart of the discharge provisions adopted is provided in table 5.2. Ships were to retain oil on board within these zones and discharge oil "slops" outside the zones or into reception facilities in ports. Neither the equipment for retaining slops on board nor reception facilities were required, however.<sup>22</sup>

In addition to their unilateral legislation, the United States threatened to ban from its ports those ships that violated the unsigned 1926 agreement. Within months of the convention, the British government responded with a request to its shipping industry to voluntarily comply. The latter in turn convinced the members from seven other countries in the major shipowners' trade organization, the International Chamber of Shipping, to adhere voluntarily to the zones established in the agree-

13. As noted later, as oil moved by sea increased, so did the discharges from cargo tank cleaning and ballasting.

14. Pritchard, *Oil Pollution Control*, 12-13.

15. U.K. Ministry of Transport, *Report of the Committee*, 1. See also United Nations Secretariat, *Pollution of the Sea by Oil*.

16. Pritchard, *Oil Pollution Control*, 11.

17. Pritchard, *Oil Pollution Control*, 25-30, U.K. Ministry of Transport, *Report of the Committee*, 3.

18. Pritchard, *Oil Pollution Control*, 10.

19. Spain and Portugal banned discharges within six miles. Pritchard, *Oil Pollution Control*, 27-28.

20. Jesper Grolin, "Environmental Hegemony, Maritime Community, and the Problem of Oil Tanker Pollution," in *North-South Perspectives on Marine Policy*, Michael A. Morris, ed., (Boulder, Colo.: Westview Press, 1988), 22.

21. Pritchard, *Oil Pollution Control*, 15.

22. The rules did require removal of economic disincentives to providing the on-board equipment, however. Such clauses have never been reinstated in subsequent agreements.

**Table 5.2** Intentional oil pollution discharge standards, 1926 through present

Convention date	Dates in force	Age of ship	Discharge limit within zones*	Discharge limit outside zones*	Maximum total discharge
1926	Never	All	< 500 ppm	None	None
1935	Never	All	< 500 ppm	None	None
1954	1958–1967	All	< 100 ppm	None	None
1962	1967–1978	Old	< 100 ppm	None	None
		New		< 100 ppm	None
	1978–1983	All	Clean ballast	< 100 ppm –60 l/m	< 1/15,000 tc
1973/1978	1983–present	Old	< 15 ppm	< 60 l/m	< 1/15,000 tc
		New	< 15 ppm	< 60 l/m	< 1/15,000 tc

\* = Zones of 50 miles plus special areas.

ppm = Parts per million.

l/m = Liters per mile.

tc = Total cargo capacity.

ment.<sup>23</sup> Pressures from countries advocating adoption of the convention faded as ships apparently complied with this voluntary agreement and with the unilateral U.S. and British legislation.<sup>24</sup> The United States also had new scientific tests which convinced it that oil did not persist indefinitely. In light of these factors and the continued strong resistance of some countries, especially Germany, the agreement was never adopted.

**The 1935 Draft Convention** By the 1930s, most experts believed that “the problem was less severe than a decade ago”.<sup>25</sup> However, continued pressure by British environmentalists, who saw the zone system as inadequate, led the British to reinstate international efforts at oil pollution regulation. Caught between a strong environmental lobby and a

strong shipping industry, the British asked a League of Nations’ Committee of Experts in 1934 to draft a new version of the 1926 accord.<sup>26</sup> A survey by the committee showed that most countries still had little direct experience of serious oil pollution. There also remained considerable scientific uncertainty about how persistent oil was and how far it would float from the point of discharge. But the panel concluded that international action was nonetheless desirable.<sup>27</sup>

The League’s redrafting built on the 1926 negotiation. The discharge limit of 500 ppm was retained, although the zones could be expanded from 50 to 150 miles. Extensive discussions took place over requiring ships to install the oily-water separators which the United States had initially proposed in 1926. While retrofitting existing ships received little support, eighteen of twenty-eight countries supported requiring separators on new ships. However, that eighteen countries did not include the United States and United Kingdom, without whose support any agreement would fail. For the Americans, an apparent reduction in coastal pollution due to shipowners’ voluntary compliance with the 1926 agreement supported the view that zones were proving effective and equipment requirements were unnecessary.<sup>28</sup> The contradiction between British support for international agreement but lack of support for equipment requirements illustrated their conscious use of the international negotiations to quell domestic environmental concerns without imposing significant costs on their own shipping industry.<sup>29</sup> A requirement that ports provide reception facilities for oil (essential to effective use of retention on board) was discussed but replaced with a recommendation because of the resistance of the United States and other countries and the acknowledged unlikelihood of compliance: only seven of thirty-four countries had port reception facilities at the time.<sup>30</sup>

26. Pritchard, *Oil Pollution Control*, 48. One British politician commented at the time, “We would welcome international action . . . to still the protests of the bird societies and to safeguard our mercantile marine from the risk of suddenly being subjected to arbitrary and possibly ill-advised or unworkable rules which . . . other countr[ies] might seek to impose upon foreign shipping” (Geoffrey Thompson in Pritchard, *Oil Pollution Control*, 44).

27. Pritchard, *Oil Pollution Control*, 52.

28. Pritchard, *Oil Pollution Control*, 200.

29. Pritchard, *Oil Pollution Control*, 48.

30. Pritchard, *Oil Pollution Control*, 53, 60–61.

23. Pritchard, *Oil Pollution Control*, 202–3.

24. Pritchard, *Oil Pollution Control*, 39. Indeed, the major U.S. anti-oil pollution group disbanded shortly after the U.S. Oil Pollution Act of 1924 was passed. Pritchard, *Oil Pollution Control*, 12.

25. Pritchard, *Oil Pollution Control*, 51.



Three attempts to improve enforcement were also made. The French proposed that coastal states rather than flag states (the state of a ship's registry) be given exclusive jurisdiction to prosecute treaty violations. While this proposal failed, two other efforts succeeded. States were required to impose fines severe enough to discourage violations. And, "ship masters would be required to enter into the ship's log all incidents involving the discharge of oil".<sup>31</sup> Each of these discussions foreshadowed debates that would recur in subsequent negotiations.

The League Committee of Experts completed the draft treaty in 1935 and received "overwhelmingly favorable" responses.<sup>32</sup> Most countries were ready to attend a planned signing conference. Indeed, U.S. interest in oil pollution control, which had abated during the late 1920s and early 1930s, revived after a spate of accidental spills. As they had in 1924, the Americans took unilateral action. Congress passed the 1936 Tank Vessel Act with "stricter construction and operational standards for American tankers."<sup>33</sup> The U.S. State Department also succeeded in getting American and British shipowners to expand their voluntary adherence to the 1926 agreement to 100 miles around U.S. coasts.<sup>34</sup> While the British were the major maritime state pushing the League draft agreement, their ambivalent stance—seeking to placate domestic environmentalists without hindering their shipping industry—led them to balk at convening a conference that looked doomed to failure given German, Italian, and Japanese resistance.<sup>35</sup> Oil pollution got pushed off the international agenda as German expansion and World War II loomed on the horizon. The planned conference was never held and the draft treaty was never signed.

Despite their failure to achieve agreement, these international efforts induced some response by industry. Seven nations' shipping interests did, under governmental pressure, "volunteer" to discharge outside 50-mile zones. Of course, since the treaties never entered into force, enforcement was impossible, and no data on compliance is available.

31. Pritchard, *Oil Pollution Control*, 57. Why negotiators expected shipmasters to log self-incriminating information is unclear, however.

32. Pritchard, *Oil Pollution Control*, 60.

33. Pritchard, *Oil Pollution Control*, 62.

34. U.K. Ministry of Transport, *Report of the Committee*, 4.

35. Pritchard, *Oil Pollution Control*, 70.

However, oil pollution along the U.S. coast decreased enough to defuse U.S. pressures for international action. In part, this was due to ship-building improvements that had the environmental side benefit of reducing leakage and oil clingage.<sup>36</sup> The combination of reduced U.S. pressure and continued British pressure suggests that tankers complied with the voluntary agreement when it was cheap and easy and violated it when it was not. Thus, en route to the United States, discharging wastes in the mid-Atlantic outside U.S. zones involved few costs. In contrast, en route to European states, tankers would have needed to swing far outside normal routes to comply. They proved unwilling to incur the corresponding costs of delays and extra fuel, and the United Kingdom's pollution problem remained unabated.<sup>37</sup>

#### Signed but Ineffective Agreements: 1954–1967<sup>38</sup>

The 1954 International Convention for the Prevention of Pollution of the Sea by Oil While efforts prior to World War II failed to achieve any signed agreements, the draft agreements shaped the negotiations that arose after the war. The oil pollution problem had changed since before the war. Before the war, oil discharges were mainly from the bilges and deballasting of the fuel tanks of non-tankers. After the war, growing demand for crude oil, shipped from the Middle East but refined in Western countries, meant that more tankers were discharging the more persistent crude (verse refined) oils after tank cleaning and ballast operations.<sup>39</sup> Complaints of spoiled beach resorts and of large numbers of dead sea birds grew rapidly in the United Kingdom and elsewhere in Europe.<sup>40</sup> The United Kingdom continued to lead the call for international regulation. Particular interest groups rather than the public at large continued to be the major source of pressure for action by the United Kingdom. Nongovernmental organizations including bird

36. Pritchard, *Oil Pollution Control*, 64.

37. Of course, the stronger sustained concern of British environmental NGOs, discussed below, suggests that activism in the United Kingdom may well have continued even had the level of pollution decreased.

38. All of the following sections build extensively on the excellent analyses in M'Gonigle and Zacher, *Pollution, Politics, and International Law*; and Pritchard, *Oil Pollution Control*.

39. Kirby, "The Clean Seas Code," 203.

40. U.K. Ministry of Transport, *Report of the Committee*, 1.

protection societies, hotel and tourist organizations, and local governments banded together to form the U.K. Advisory Committee on the Prevention of Pollution of the Sea by Oil (ACOPS).

In response to such pressures, the United Kingdom established the Committee on the Prevention of Pollution of the Sea by Oil, the Faulkner Committee.<sup>41</sup> Its 1953 report concluded that the persistence of crude oils made the prewar zone system merely a “palliative.” It recommended an international ban on discharges above 100 ppm by all ships (tankers and non-tankers) throughout the ocean. In the interim, U.K.-registered ships should be banned from discharges over 100 ppm “within a wide zone around the United Kingdom.”<sup>42</sup> In contrast, the United States, feeling it had solved its pollution problems through unilateral measures and voluntary compliance by industry with the zone system, had lost interest in international regulation.<sup>43</sup> As the U.S. delegate phrased it, “The pollution problem in the United States today is less critical than it was a quarter century ago, notwithstanding we are consuming three times as much petroleum and products today as we did in 1926.”<sup>44</sup>

The British belief that zones were inadequate, and the desire to avoid encumbering their domestic shipping and oil interests, led them to press for international action. They were also under pressure to do so from ACOPS, which held a conference in 1953, inviting environmental groups, national governments, and oil and shipping interests.<sup>45</sup> At the conference, the British government announced they would host the intergovernmental conference recommended in the Faulkner report.<sup>46</sup>

Thirty-two countries attended the intergovernmental conference of 1954 in London. While many European nations considered oil pollution a problem, most developing and Soviet bloc nations still did not.<sup>47</sup>

41. U.K. Ministry of Transport, *Report of the Committee*.

42. U.K. Ministry of Transport, *Report of the Committee*, 33.

43. Pritchard, *Oil Pollution Control*, 84.

44. International Conference on Pollution of the Sea by Oil, “General Committee: Minutes of 3rd Meeting Held on 30th April 1954,” 4.

45. M’Gonigle and Zacher, *Pollution, Politics, and International Law*, 84.

46. While the Intergovernmental Maritime Consultative Organization (IMCO)—established under the United Nations in 1948—was the obvious forum to hold such negotiations, it did not start operation until 1958.

47. For a discussion of particular states’ views of the seriousness of oil pollution during the 1954 Conference, see Pritchard, *Oil Pollution Control*, Figure 2,

Both the size and biological effects of the oil pollution problem were debated.<sup>48</sup> The United Kingdom proposed to limit discharges throughout the ocean, a dramatic change from the prewar zonal approach that would have required tankers to stop discharging waste oil at sea, rather than merely discharging far from shore.<sup>49</sup> Tankers could largely eliminate oil pollution if they “refrained from cleaning their cargo tanks and mixed oily ballast residues with new cargo oil.”<sup>50</sup> Ships could also pump oil-water mixtures from ballasting and tank-cleaning operations to a slop tank where the oil would separate and the water could be decanted from the bottom. Such requirements prompted resistance from two quarters. Industry resisted because discharging slops at sea could be done while underway, whereas complete oil retention required lengthy port delays to discharge slops. Governments resisted the complementary requirement to provide expensive reception facilities to receive these slops. Most countries felt such costs were unwarranted given that they themselves were not experiencing severe costs from oil pollution. The United Kingdom attempted to increase concern, even flying delegates to its beaches to demonstrate the problem, but “if domestic experience had little effect on states’ policies, this predictably had even less.”<sup>51</sup> Rather than trying to establish an international scientific review process to increase concern over the long term, they opted to develop the most stringent regulations possible given the current level of concern, in hopes of establishing a regulatory base from which more stringent measures could be adopted once concern increased.

98–99); and responses to the U.N. survey conducted in 1956 United Nations Secretariat, *Pollution of the Sea by Oil*.

48. For example, the Faulkner report itself concluded that there was no evidence that fish or shellfish beds were harmed by oil pollution (U.K. Ministry of Transport, *Report of the Committee*, 2–3). The French argued at the 1954 conference that their research had “produced no proof that its effects upon marine life were harmful” (International Conference on Pollution of the Sea by Oil, “General Committee: Minutes of 5th Meeting Held on 5 May 1954,” 5). By this time, crude oil tankers clearly had become the major source of oil pollution.

49. M’Gonigle and Zacher, *Pollution, Politics, and International Law*, 90.

50. Pritchard, *Oil Pollution Control*, 95.

51. M’Gonigle and Zacher, *Pollution, Politics, and International Law*, 87.

The failure to limit discharges throughout the ocean left a final agreement in 1954 which looked very much like the prewar agreements. The International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL) reflected "the fact that most governments were still not willing to accept any important control costs themselves or even to impose such costs on their industries."<sup>52</sup> It prohibited discharges above 100 ppm within 50-mile zones.<sup>53</sup> This was some progress from the 500 ppm limit of the prewar draft agreements. Outside the zones, discharges remained unrestricted. The 1954 convention, like the prewar agreements, required no reduction in the amount of oil discharged, only its redistribution outside the zones, from where it nonetheless might reach shore. The final agreement also refrained from requiring the reception facilities without which tankers were forced to discharge at sea.<sup>54</sup> Regarding enforcement, the countries modified the 1935 draft language and required ship masters to record all tanker ballasting, cleaning and discharge operations in a newly developed Oil Record Book instead of in the ship's log.<sup>55</sup> Port states could inspect these books but not delay the ship, and were limited to providing evidence to flag states for prosecution of violations.<sup>56</sup> In 1958, the convention received the requisite ten ratifications, with five from major shipping states,<sup>57</sup> and the first international rules regulating oil discharges entered into force.

Given the design of the 1954 regulations, enforcement capabilities were quite limited and compliance was unlikely. The difficulty of enforcement under zonal arrangements had been noted at the 1926 conference, when one delegate stated: "We know the difficulties of getting evidence within our own three-mile limit. A fortiori what are the difficulties going to be in enforcing it when it comes to a matter of 50 to 150 miles?"<sup>58</sup> As with the prewar period, data on

52. M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 89.

53. Some wider zones were established near Australia, the North Sea states, and in the Atlantic off the European and British coasts.

54. Pritchard, *Oil Pollution Control*, 108.

55. This had been recommended in the Faulkner report as an amendment to the Oil Pollution Act of 1922 as well (Ministry of Transport, *Report of the Committee*, 32).

56. Pritchard, *Oil Pollution Control*, 112.

57. Defined as states having aggregate shipping tonnage of over 500,000 tons.

58. Pritchard, *Oil Pollution Control*, 23.

enforcement and compliance with discharge regulations is virtually nonexistent.<sup>59</sup> A 1962 survey of twelve countries showed essentially only two countries detecting and prosecuting violations of the 1954 regulations. Enforcement by flag states and beyond states' territorial waters of three miles was nonexistent despite the treaty's 50-mile zones.<sup>60</sup>

**The 1962 Amendments** The years following the 1954 OILPOL agreement saw a rapid increase in the amount of oil transported by (and discharged at) sea. More states became concerned about pollution, especially in the Mediterranean. Without wasting time and fuel to go beyond prohibition zones off Europe's Atlantic coast, tankers could deballast and clean their tanks in the still-legal discharge area in the central Mediterranean.<sup>61</sup> This assumed they observed OILPOL's requirements at all. Dissatisfied with the results of OILPOL, ACOPS sponsored a conference of eleven countries in 1959 which recommended extending the 1954 zones and globally banning operational discharges.<sup>62</sup>

In 1958, the Inter-Governmental Maritime Consultative Organization (IMCO) had come into existence. Its mandate encompassed the full range of international shipping regulation. Among other responsibilities, it assumed secretariat responsibilities for the 1954 OILPOL agreement from the British government and helped prepare the amending conference that parties to the 1954 Conference had urged take place after a few years of experience with the rules. IMCO sponsored the conference in 1962. Thirty-eight states attended. Negotiators maintained 50 miles as the minimum coastal zone, but extended the zones to cover 100 miles from many coastlines and the whole of the North and Baltic seas.<sup>63</sup> Discharges below 100 ppm remained legal within these zones.

59. As Congressman John Burton remarked, IMO "has seldom monitored compliance with [its] rules. It has certainly never enforced the rules" (House Committee on Government Operations, *Oil Tanker Pollution—Hearings*, 95th Congress, 2nd session, House 401-8 (Washington, D.C.: GPO, 1978) 4.

60. Pritchard, *Oil Pollution Control*, 112. See also, M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 220–221.

61. Kirby, "The Clean Seas Code," 203.

62. Pritchard, *Oil Pollution Control*, 119.

63. An intriguing French proposal to increase the speed of signatures by decreasing the size of prohibition zones off non-party states failed (Pritchard, *Oil*

Industry raised little objection to these extensions. Whatever the nominal zone width, whether 50 or 100 miles, experience since 1954 had shown that enforcement never extended beyond a country's three-mile limit.

Making their 1954 proposal more palatable, the British proposed that *new* tankers over 20,000 tons be banned from discharging anywhere in the ocean. However, they did not complement this performance standard with the obvious equipment requirements that these ships install oily-water separators and that ports provide reception facilities to receive the wastes generated. Indeed, they explicitly rejected requiring governments to provide the latter and exempted even new ships from the discharge ban when going to ports without facilities. While these qualifications did not remove opposition from states with large shipping interests, such as the United States and Japan, the proposed restriction on new tankers was adopted. As with the zone extensions, "the industry was strangely silent."<sup>64</sup>

Other policy changes in 1962 included resurrection of the 1935 clause that penalties be severe enough to discourage violations. Provision was also made to allow future amendments to occur within the IMCO structure rather than requiring a conference.<sup>65</sup> The 1962 Amendments entered into force in 1967, but seemed to produce little improvement in compliance. While data was still hard to obtain, pollution remained a problem. The performance standards still meant that "the harmful consequences of an illegal discharge from ships at sea is often evident but tracing the offender and prosecuting him is sometimes almost impossible."<sup>66</sup> As late as 1975, a British oil pollution expert did not think "there was a tanker over 20,000 [tons] in the world complying with the 1962 Amendments."<sup>67</sup> No significant increase in re-

ception facilities occurred. However, the rules did induce increased research into alternative means to reduce discharges: the United States developed segregated ballast tanks, the Soviet Union developed chemical washing techniques, and British oil companies developed the load on top (LOT) technique.<sup>68</sup>

Although the 1962 Amendments had not required them, oil companies recognized that expensive equipment requirements were needed for new ships to comply with the general prohibition. The 1962 conference had also left environmentalists still unsatisfied and so, under British pressure, Shell developed the load on top technique, in which, during the return voyage, oil-water mixtures from ballast and tank cleaning would be transferred to a single cargo tank where the water would settle out and be discharged at sea. Then the next load of cargo would be loaded directly on top of the remaining oil residues. Oil companies had previously required tankers to clean their tanks between each load of cargo to preserve crude oil quality. Only the threat of expensive international equipment rules led them to "discover" that "most crude oil cargoes are compatible," thus removing their major objection to mixing residues from one delivery with subsequent cargoes.<sup>69</sup>

Oil companies preferred LOT to equipping new tankers with the equipment needed to meet the 1962 general prohibition. Since discharging residues occurred as part of delivery of the subsequent cargo, LOT also eliminated the need to spend additional time in port discharging residues. Governments liked LOT because it also removed the need to build reception facilities. And, when used properly, LOT significantly reduced total oil discharged from ships. However, since oil companies designed LOT to avoid equipment costs, it required tanker operators to determine by sight when to stop discharging water from beneath oil slops. Oil companies admitted that, in practice, this would frequently produce discharges exceeding 100 ppm by large amounts, violating the

*Pollution Control*, 133). Unfortunately, such an effort at reciprocity has received little serious consideration.

64. M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 95-96.  
65. Recommendations from IMCO's Maritime Safety Committee approved by the IMCO Assembly would become effective upon receipt of a qualified majority of ratifications (Pritchard, *Oil Pollution Control*, 122).

66. G. Boos, "Revision of the International Convention on Oil Pollution."

67. M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 99.

68. Pritchard, *Oil Pollution Control*, 145. As James Kirby noted, "It was only our close study of the solution recommended by the [1962] conference of discharging oil ashore into slop facilities that really drove us towards the Load-on-top method." "Background to Progress," *The Shell Magazine* 45 (January 1965): 26.

69. Kirby, "The Clean Seas Code," 206.

1954 and 1962 discharge limits.<sup>70</sup> Nonetheless, by 1964, Shell had allegedly gotten LOT adopted by some 60 percent of tankers, including most American and European ships.<sup>71</sup>

### Progress Toward Effective Control: 1967–1991

**The 1969 Amendments** Since the 1920s, pressure to reduce oil pollution rested on the belief that “once the stuff is in the sea, it is there for ever.”<sup>72</sup> By the late 1960s, however, the evidence was “overwhelming” that natural processes made oil “unobjectionable” over time.<sup>73</sup> Nonetheless, by then, the history of international regulation had made it “axiomatic that the less oil discharge into the sea, the better.”<sup>74</sup> In this context, the grounding of the *Torrey Canyon* in 1967 provided a major new impetus to oil pollution control. The accident raised public concern in many European countries, and major international agreements to address tanker accidents were quickly signed. Growing environmentalism was also raising broader concerns over all ocean pollution.

ACOPS once again hosted a conference which helped push operational discharges onto the international agenda. Their Rome conference of 1968 occasioned a major proposal by Shell to scrap the existing zonal system and the implicit equipment requirements of the 1962 amendments in favor of LOT, or what Shell called the Clean Seas Code.<sup>75</sup> The issue of modifying international regulations to legitimize LOT and eliminating equipment requirements had already been raised in IMCO’s newly established Subcommittee on Oil Pollution (SCOP) in 1965.<sup>76</sup> The British, who had been the major force for reduced oil pollution up

70. Indeed, accurate oil content meters had not yet been developed.

71. Kirby, “The Clean Seas Code,” and M’Gonigle and Zacher, *Pollution, Politics, and International Law*, 97.

72. Sir Gilmou Jenkins in Kirby, “Background to Progress,” 26. See also the U.S. Bureau of Mines study to the 1926 Conference and the Report on the Second Session of the League of Nations Committee of Experts (par. 21) of Oct. 26, 1935 (both cited in U.K. Ministry of Transport, *Report of the Committee*, 6–9) as well as the Ministry of Transport conclusions themselves.

73. C. T. Sutton, “The Problem of Preventing Pollution of the Sea by Oil,” *BP Magazine* 14 (Winter 1964): 9.

74. Kirby, “The Clean Seas Code,” 210.

75. Kirby, “The Clean Seas Code.”

76. M’Gonigle and Zacher, *Pollution, Politics, and International Law*, 99.

until the 1962 conference, now began working much more closely with their oil companies. In 1968, they proposed to the IMCO subcommittee that all governments promote LOT. At the same time, growing domestic environmentalism was leading the United States to seek stronger international controls.<sup>77</sup>

The conflicting efforts to modify the convention came to a head in the Subcommittee on Oil Pollution during 1968. Oil and shipping companies, with British and French support, wanted to avoid expensive equipment requirements aboard ships and the need to build reception facilities. Environmental states, led by the United States, wanted to strengthen the regulations. The oil companies succeeded in getting the 100 ppm rule for tankers replaced with a rule prohibiting discharges at rates over 60 liters per mile.<sup>78</sup> They eliminated the 1962 rules regarding new tankers.<sup>79</sup> They also blocked new requirements for construction of reception facilities.

However, their efforts to scrap the zones failed. The 50-mile zones were retained with the discharge limit of 60 liters per mile applying *outside* them. Within the zones, only discharge of “clean ballast” which did not leave a visible sheen was allowed. Therefore “any sighting of a discharge from a tanker . . . would be much more likely to be evidence of a contravention.”<sup>80</sup> The United States also seized on the oil industry’s contention that LOT would make the convention “automatically enforced world wide.” A U.S. proposal was accepted to require total discharges be limited to 1/15,000 of a tanker’s cargo capacity. Without requiring precise measurements, these rules allowed port authorities to assume that any tanker with clean tanks had blatantly violated the agreement.<sup>81</sup> However, international law barred port states from such

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

78. By limiting the rate of discharge rather than the oil content, this rule removed the requirement for oil content monitors and separators, which were expensive and had technical problems. The 60 l/m rate posed few problems for tankers since it was “a figure within which any responsibly run ship, no matter how big, could operate” (J. H. Kirby, “The Clean Seas Code,” 208).

79. IMO, *International Convention for the Prevention of Pollution of the Sea by Oil*, 1954 (as Amended in 1962 and 1969) (London: IMO, 1983), Article 3(b)(ii).

80. Resn. A.391(X) (1977), Annex, par. 5.

81. Kirby, “The Clean Seas Code,” 200, 209; and William T. Burke, Richard Legatski, and William W. Woodhead, *National and International Law Enforce-*

intrusive inspections of vessels, a legal barrier that was not removed until the 1973 convention.

The IMCO Assembly adopted these amendments in October 1969, dramatically changing the underlying principle of oil pollution regulation. The 1926, 1935, 1954, and 1962 rules had all permitted discharges except in prohibited zones. In contrast, the new rules prohibited discharges except under certain conditions.<sup>82</sup> And, for the first time, international rules required that oil entering the ocean be reduced rather than merely redistributed.

Progress on paper did not mean progress on the ground, however. Ratifications were so slow that the 1969 Amendments only entered into force in 1978. Since then, discharges have been essentially limited to "clean ballast" of 15 ppm within 50 miles from land, rates of 60 l/m outside these zones, and a maximum of 1/15,000 of total cargo capacity. Since changes to these standards in 1973 and 1978 have left them essentially unchanged,<sup>83</sup> compliance and enforcement with these standards will be discussed after the sections on the 1973 and 1978 conferences.

**The 1973 International Convention for the Prevention of Pollution from Ships** The growing environmental interest of the late 1960s became manifest in the early 1970s with the UN Conference on the Human Environment and the London Dumping Convention. The oil pollution problem also continued to grow as oil transported by sea con-

---

*ment in the Ocean* (Seattle: University of Washington Press, 1975), 129. Imagine a new tanker that loads 150,000 tons of oil in Kuwait. It delivers 149,400 tons in Rotterdam, leaving 600 tons remaining as "clingage" of oil to the tanks' sides. On its return voyage to Kuwait, it ballasts several tanks with seawater and cleans others with seawater. It allows the oil to separate from the resulting oil-water mixtures and discharges the water overboard. If it arrives in Kuwait with less than 590 tons of oil residues ("slops"), it would clearly have discharged more than 1/15,000 of its 150,000 tons. The more likely scenario would involve arrival in Kuwait with completely clean tanks or negligible slops.

82. Samir Mankabady, *The International Maritime Organization*, vol. 1, *International Shipping Rules* (London: Croom Helm, 1986), 318.

83. The 1973 Amendments superseded and essentially incorporated the 1969 standards, the only changes being a total discharge standard of 1/30,000 for new tankers and a redefinition of "clean" ballast as 15 ppm. As discussed below, the major innovation was to complement discharge limits with equipment requirements.

tinued to increase (see figure 5.2). Countries such as Greece and Italy that had previously opposed strict regulations adopted more environmentalist stances as they experienced more operational pollution and greater calls for environmentalism at home.<sup>84</sup>

These forces had their strongest impact in the United States, which pushed for regulations stricter than the 1969 Amendments. While the LOT system had only been legally legitimized in 1969, oil companies had allegedly been using it since 1964. And the United States believed this experience proved LOT was far less effective than the oil companies claimed.<sup>85</sup> Therefore, in the early 1970s, the United States proposed supplementing the existing performance standards with equipment standards. These included requirements for existing tankers and ports to install the equipment necessary to comply with the 1969 performance standards, such as oil discharge monitors, oily-water separators, dedicated slop tanks and reception facilities. They also sought measures beyond those needed to implement the 1969 amendments. They sought to widen the prohibition zones to 100 miles while restricting allowable discharges within them to 10 ppm, and to reduce rate limits outside the zones from 60 to 30 l/m. To reduce oil-water mixtures from ballast operations, new tankers over 70,000 tons were to have piping that completely segregated ballast tanks from cargo tanks, a design known as SBT. In addition, to reduce spills during accidents they proposed that new ships have double bottoms. The last two proposals were especially expensive.

The domestic pressures behind the United States' international efforts also found expression in congressional passage in 1972 of the Ports and Waterways Safety Act. It required the Coast Guard unilaterally to adopt strict equipment standards by 1976 unless other countries agreed to rules similar to those the United States was proposing. The Coast Guard was also to deny entry to any ships violating such rules.<sup>86</sup>

At the same time, Canada began an "aggressive diplomatic campaign" to lobby for protection of coastal state environmental rights.<sup>87</sup>

84. M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 118.

85. M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 108.

86. U.S. Public Law 92-340, Ports and Waterways Safety Act of 1972, 10 July 1972, Sec. 201(13).

87. Grolin, "Environmental Hegemony," 27.

Motivated by both environmental and territorial concerns, Canada worked with other developed coastal states like Australia and New Zealand to persuade developing states to attend the 1973 International Conference on Marine Pollution. That conference and the International Convention for the Prevention of Pollution from Ships (known as MARPOL) which emerged from it were far broader in scope than previous agreements. They applied to oil platforms as well as ships, included refined as well as crude oil, and used five annexes (including Annex 1 for oil) to address liquid chemicals, harmful packaged substances, sewage, and garbage discharged by ships. This broader perspective on pollution had been foreshadowed in IMCO's renaming of the Subcommittee on Oil Pollution as the Subcommittee on Marine Pollution in 1969, and in the creation of the Marine Environment Protection Committee in 1973 as a full committee answering directly to the IMCO Assembly.

The U.S. proposals provided the basis for most of the conference's discussion on oil tankers, however. Despite U.S. pressure, the final agreement maintained essentially the same performance standards. The zones remained at 50 miles, though special areas were designated in the Mediterranean, Baltic, Black, and Red seas and in the Persian Gulf, but not the North Sea.<sup>88</sup> Outside the zones, discharges below 60 l/m remained legal (see table 5.2). Inside the zones, the negotiators defined the "clean ballast" limitation of the 1969 Amendments as 15 ppm, although the United States was seeking a 10 ppm definition. Total allowable discharges were kept at 1/15,000 of cargo capacity for existing tankers, although new tankers were limited to 1/30,000.<sup>89</sup>

The far more controversial aspects of the proposals involved the equipment standards. The final outcomes required equipment for compliance with the discharge standards—oily-water separators and monitoring devices—on all new tankers delivered after 1979<sup>90</sup> and on

88. The special areas in the Red Sea and Persian Gulf were designated as part of the 1973 Convention. However, only the 50-mile zones applied until a sufficient number of states had provided reception facilities at all oil-loading terminals (International Conference on Marine Pollution, *International Convention for the Prevention of Pollution from Ships*, 1973. (London: IMO, 1973), Annex 1, reg. 10 (hereafter cited as MARPOL Convention).

89. MARPOL Convention, Annex 1, reg. 9.

90. "New" tankers were defined as tankers with building contracts placed after

existing tankers from three years after the treaty entered into force. The segregated ballast tank requirement for new tankers initially evoked strong opposition from states with large shipping interests and from oil companies. Two factors reduced resistance to the SBT requirement. First, it promised to dissuade the United States from unilaterally adopting the even more expensive double bottoms. Second, the recent construction boom meant that the cost of building new tankers with SBT would not be felt until far into the future.

Large increases in the quantity of oil transported by sea, and a corresponding increase in discharges, prompted new concern in many coastal states. Developed states with long coastlines and small shipping industries—like Australia, Canada, and New Zealand—supported the United States' SBT proposal. Italy, traditionally opposed to stringent requirements, joined the environmental ranks as it experienced increased coastal pollution. Developing states—such as Egypt, Argentina, and India—lent their support since they faced growing pollution from developed countries' ships and saw few direct costs to their own small-sized tanker fleets. They also supported SBT as a means to reduce oil wastes generated and thereby deflect growing pressures to require them to build expensive reception facilities. In an era of détente, Soviet bloc countries saw support as having low economic costs and both political and environmental benefits. This diverse coalition was large enough to pass the requirement. However, "it was opposed to the end by states with large independent shipowning interests, and by the two states anticipating the construction of" new tankers, France and Japan. Finally, while states were required to "ensure provision" of reception facilities in all tanker ports, this left ambiguous whether states or industry would be responsible for constructing them.<sup>91</sup> Table 5.3 details the final equipment requirements.

The 1973 conference also sought to improve implementation, enforcement and compliance. Continuing ratification delays were addressed through a tacit acceptance procedure which permitted entry

31 December 1975, or whose keel was laid after 30 June 1976, or whose delivery occurred after 31 December 1979 (MARPOL Convention, Annex I, reg. 1, par. 6).

91. M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 114–120.

**Table 5.3** MARPOL 1973/1978 SBT and COW requirements for crude oil carriers

Tanker size	Existing ship	New ship under MARPOL 73 but existing ship under 78 Protocol	New ship under 78 Protocol
70K <= DWT	SBT or COW	SBT*	SBT* and COW
40K <= DWT < 70K	SBT or COW	SBT or COW	SBT and COW
20K <= DWT < 40K	No requirement	No requirement	SBT and COW
DWT < 20K	No requirement	No requirement	No requirement

\* SBT required under MARPOL 1973, all other requirements under Protocol of 1978.

#### DEFINITION OF NEW SHIP:

MARPOL 73: Building contract after 31 December 1975 or keel laid after 30 June 1976 or delivery after 31 December 1979.

Protocol 78: Building contract after 1 June 1979 or keel laid after 2 February 1980 or delivery after 1 June 1982.

Source: Sasamura, 1990.

into force of certain amendments unless more than one-third of the signatories explicitly objected. The conferees also applied construction standards to ships built after set dates, regardless of the number of ratifications.<sup>92</sup> Compliance with the equipment standards was to be established by initial surveys by national governments and ship classification societies documented in an International Oil Pollution Prevention (IOPP) Certificate. States were given expanded rights to inspect the IOPP certificates of ships entering their ports and to determine whether they met the equipment requirements. If found in violation, governments were obligated to “take such steps as will ensure that the ship shall not sail until it can proceed to sea without presenting an unreasonable threat of harm to the marine environment”.<sup>93</sup> Negotiators hoped that providing more environmentalist port states with such enforcement powers would improve compliance. The conference also established a technical cooperation program to train developing countries’ merchant

92. This built on the approach of amendments adopted in 1971, limiting tank size to address the size of accidental spills (Pritchard, *Oil Pollution Control*, 159).

93. MARPOL Convention, art. 5(2).

marines to mitigate marine pollution and to help fund reception facilities.<sup>94</sup>

While the MARPOL agreement did not enter into force until 1983, it began to have an impact as soon as January 1976, after which time large contracts for new tankers had to include SBT. All evidence suggests that ship buyers began complying with this regulation on schedule. “No company ordering a new ship could afford to ignore draft regulations which they knew would be adopted and enter into force whilst the ship was still comparatively new.”<sup>95</sup> An extended discussion of compliance with these equipment requirements, the 1978 Protocol additions to them, and amendments during the 1980s, follows the discussion of the 1980s period.

**The 1978 Protocol to the 1973 Convention**<sup>96</sup> The 1973 MARPOL Convention failed to gain quick ratification, both because of the strong resistance that the new equipment and reception facility requirements generated and because adoption of Annex 1 addressing oil pollution was legally linked to adoption of Annex 2 on chemical pollution, which imposed even higher costs on states. Then, just as the *Torrey Canyon* incident had motivated the 1969 Amendments and the 1973 conference, a series of accidents in December 1976 and January 1977, including the *Argo Merchant* grounding off Nantucket, Massachusetts, combined with activist pressures, including lawsuits by the Center for Law and Social Policy and other environmentalist groups,<sup>97</sup> to produce unilateral U.S. action and put oil pollution back on the international agenda.

94. Michelle Sieff, “An Analysis of the IMO’s Technical Cooperation Program” (unpublished paper, Dartmouth College, 1991), 3.

95. G. Victory in James Cowley, “The International Maritime Organisation and National Administrations,” *Transactions of the Institute of Marine Engineers* 101 (1989): 129.

96. The following discussion relies extensively on M’Gonigle and Zacher, *Pollution, Politics, and International Law*, and Sielen and McManus, “IMCO and the Politics of Ship Pollution.”

97. Attorneys from the Center for Law and Social Policy, representing fifteen environmental groups, were among the U.S. delegates to the 1973 and 1978 conferences. Clifton E. Curtis, “Statement” in Senate Committee on Foreign Relations, *Hearings on Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, with Annexes and Protocols*, 96th Congress, 2nd session, Exec. Rept. No. 96–36 (Washington, D.C.: GPO, 1980), 9.



In response to the accidents and congressional pressure, the Carter Initiatives were proposed. These included double bottoms and other systems to prevent accidental spills, but also addressed operational pollution by requiring that the Coast Guard unilaterally require SBT on all tankers above 20,000 tons and annual tanker inspections, unless international negotiations produced stronger standards. Under direct threats that “if IMCO tailors its moves to suit and protect the U.S., we will accept; if not, we reserve the right to impose our own rules,” IMCO called the Tanker Safety and Pollution Prevention Conference in 1978.<sup>98</sup> This conference produced a protocol that became integral to the 1973 MARPOL agreement, together known as MARPOL 73/78.

At the 1978 conference, the United States proposed to expand the application of the 1973 SBT rule from *new* tankers over 70,000 tons to *new and existing* tankers over 20,000 tons, but found little support. Various alternatives were proposed. The most important of these, pressed by the oil industry and the United Kingdom, involved requiring existing tankers over 70,000 tons to install a tank-cleaning system that used crude oil to wash tanks. As had occurred with LOT in the 1960s, the oil industry had reevaluated its technological options in light of the growing political imperative to reduce oil pollution that had become evident in MARPOL 73’s SBT requirements. The crude oil washing technique (COW), which had been available since the late 1960s, became more attractive as U.S. pressures to require SBT on all existing tankers increased. While rising oil prices also played a role, the political pressures undoubtedly helped promote industry support for a COW requirement. COW significantly reduced oil residues without requiring additional time in port, since the process occurred during cargo delivery. While proposed as an alternative to SBT, in fact COW addressed the oil-water mixtures from tank cleaning, not ballasting operations. The placement of segregated ballast tanks in protective locations was proposed as an adequate alternative to the U.S. double bottom proposal.

The support that met the United States’ 1973 proposal for SBT on large new ships evaporated with the 1978 proposal to expand it to all ships. The high costs of retrofitting revealed just how much countries

98. Brock Adams in M’Gonigle and Zacher, *Pollution, Politics, and International Law*, 130.

were willing to pay for environmental protection. A few states with very heavy pollution supported the SBT retrofit proposal, as did states with tanker fleets, which would have benefited by reducing the current overcapacity of the world tanker fleet.<sup>99</sup> But most states, including Soviet bloc and developing ones, saw SBT as too costly, preferring the cheaper COW. The oil and shipping industries, and countries representing them such as the United Kingdom, also preferred COW.<sup>100</sup> Given the “power and determination” of the United States, supporters of the British alternative recognized the need for compromise.<sup>101</sup> In contrast to the debates of the late 1960s, even the latter no longer believed in exclusive reliance on performance standards. The final protocol required new crude tankers over 20,000 tons to install SBT and COW, while requiring existing tankers over 40,000 tons to install either SBT or COW.<sup>102</sup> Existing tankers were sure to choose the cheaper COW option.

While the 1978 Protocol left performance standards unchanged, it added language requiring regular unscheduled inspections to verify compliance. The IOPP certificate and Oil Record Book were modified. In addition, to speed entry into force, the negotiators de-linked ratification of Annex 1 on oil pollution from ratification of Annex 2 on chemicals. As with the 1973 rules, applying the equipment requirements to ships delivered after June 1982 (regardless of the entry into force date) removed incentives for countries to delay ratification to slow the rule’s impact. Ratifications from the requisite fifteen states, with not less than

99. Since installing SBT on a tanker removed some 15 percent of its cargo capacity, retrofitting requirements provided a means to bring the numerous laid-up tankers of Norway, Sweden, and Greece back onto the world market. M’Gonigle and Zacher, *Pollution, Politics, and International Law*, 135.

100. As discussed below, COW actually produced net savings for oil companies.

101. M’Gonigle and Zacher, *Pollution, Politics, and International Law*, 138.

102. “New” tankers under the Protocol were defined as tankers with building contracts placed after 1 June 1979, or whose keel was laid after 1 January 1980, or whose delivery occurred after 1 June 1982 (International Conference on Tanker Safety and Pollution Prevention, 1978, *Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973* (London: IMO, 1978), Annex I, reg. 1, par. 26). Existing tankers, instead of retrofitting SBT or COW, could dedicate certain tanks to ballast for an interim period—until 1985 for tankers over 70,000 tons and until 1987 for tankers over 40,000 tons. For a chart of the application of the various regulations, see Y. Sasamura, “Oil in the Marine Environment,” in *IMAS 90: Marine Technology and the Environment* (London: Institute of Marine Engineers, 1990), 3–4.

half the world's merchant tonnage, led to entry into force of the combined MARPOL 73/78 in 1983.

**The 1980s** Having finally achieved stringent regulations on paper, many nations and the International Maritime Organization, or IMO (IMCO was renamed but left otherwise unchanged in 1981), sought to redirect its focus to compliance. By 1981, the frequent changes in and proliferation of oil pollution regulations and the problem of adopting new regulations before entry into force of old ones were inhibiting compliance. This led the IMO Assembly to resolve that the Marine Environment Protection Committee (MEPC) should consider amendments only "on the basis of clear and well-documented compelling need."<sup>103</sup> While this has not prevented amendments, they have been largely technical in nature. All have been adopted through the MEPC and have entered into force via the tacit acceptance procedure of the 1973 Convention.

The long delay in ratification of MARPOL 73/78 meant that several amendments to the agreement were proposed before it even entered into force. These amendments were agreed to during regular meetings of the Marine Environment Protection Committee in 1981, 1982, and 1983 and adopted in September 1984.<sup>104</sup> The changes sought to improve the existing equipment requirements or, at the request of shipping interests, to remedy implementation problems that had become evident with initial experience with MARPOL 73/78. They improved specifications for the MARPOL oil monitoring, separating, and filtering equipment whose details had plagued IMO for years, waived equipment requirements under strict conditions, and again modified the oil record book. Since 1984, IMO has adopted three other amendments to MARPOL. First, in 1987, the Gulf of Aden was designated a special area. Second, in 1990, guidelines for surveys under MARPOL were harmonized with surveys required under other IMO conventions. Third, in 1990, Antarctica was designated a special area.<sup>105</sup>

103. Resn. A.500(XII) 1981.

104. "First Amendments to MARPOL 73/78 Adopted," *IMO News*, no. 4 (1984): 8.

105. IMO, *Status of Multilateral Conventions and Instruments in Respect of Which the International Maritime Organization or Its Secretary-General Performs Depositary or Other Functions, as at 31 December 1990* (London: IMO, 1991).

Since 1978, concern over enforcement also grew in Europe. The *Amoco Cadiz* spilled 223,000 tons of oil off France on 16 March 1978, prompting the Commission of the European Communities to start working on directives on oil pollution enforcement and France to call a 1980 conference which led to fourteen European states adopting a Memorandum of Understanding (MOU) on Port State Control.<sup>106</sup> The MOU promulgates no new rules but has had some success at increasing enforcement of MARPOL's equipment requirements.<sup>107</sup> It requires each participating state to inspect 25 percent of ships entering its ports and to report deficiencies in certificates or equipment to a central computer processing facility. This facility gives inspectors in each country access to recent data on violations by any ship arriving in its ports.<sup>108</sup> The United States, Japan, and Canada have taken similar steps unilaterally.

As late as 1975, enforcement of the 100 ppm standard set in 1954 and 1962 was still considered "dismal, with very few cases being prosecuted, and even fewer penalties being assessed for violations."<sup>109</sup> The 1969 changes appear to have helped very little. Despite hopes at the time, the "clean ballast" provision has not led to aerial photographs becoming widely accepted as clear legal evidence of a violation.<sup>110</sup> And the improved enforcement that the 1/15,000 rule was hoped to provide seems not to have materialized.<sup>111</sup> In 1983, IMO noted that flag state

106. Member states include Belgium, Denmark, Finland, France, West Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, and the United Kingdom. The 1982 MOU replaced a similar MOU signed in The Hague by eight North Sea states in 1978 (Secretariat of the Memorandum of Understanding on Port State Control, *The Memorandum of Understanding on Port State Control* (The Hague: The Netherlands Government Printing Office, 1989), and George Kasoulides, "Paris Memorandum of Understanding: Six Years of Regional Enforcement," *Marine Pollution Bulletin* 20 (June 1989): 255-61).

107. "Control on compliance with operational [discharge] requirements did not strictly fit in the present framework of the MOU" (Secretariat of the Memorandum of Understanding, 1989, 16).

108. See Kasoulides, "Paris Memorandum of Understanding"; and Kasoulides, "Paris Memorandum of Understanding: A Regional Regime of Enforcement," *International Journal of Estuarine and Coastal Law* 5 (February 1990): 180-92 for extensive discussions of the Memorandum of Understanding on Port State Control.

109. Burke, Legatski, and Woodhead, *National and International Law Enforcement*, 48.

110. M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 328.

111. Interviews at IMO in summer 1991 confirmed that the loading port in-

prosecution of violations was “often inadequate.”<sup>112</sup> While it is often assumed that increased port state control and national aerial surveillance programs undertaken in the 1980s have helped deter violations, there is no hard evidence to confirm such an assumption.<sup>113</sup> Dutch studies conducted in 1988 and 1989 suggest that prosecution and penalty situations remain dismal.<sup>114</sup> Fines have traditionally averaged only \$5,000 to \$10,000 per violation.<sup>115</sup>

This enforcement record gives little reason to expect high compliance with the discharge standards. Given that oil companies had proposed LOT as an alternative to the standards existing during the 1960s, it seems unlikely that many ships were complying with the 1954/1962 standards. Those ships that adopted LOT before 1978, the year the 1969 Amendments entered into force, would frequently and admittedly violate the 100 ppm standards, since they lacked the meters needed to measure oil content. And, while oil representatives claimed that 80 percent of the fleet were using LOT in 1968,<sup>116</sup> oil company data for 1972

specifications for clean tanks—which would indicate discharges exceeding the 1/15,000 limit—have never been systematically conducted and that no prosecutions have depended on this rule. “Since 1972, the industry has offered to provide the information discovered to the oil-exporting states for referral to the flag states for prosecution under the 1969 Amendments. No interest has been shown by these states despite the entry-into-force of the amendments” (M’Gonigle and Zacher, *Pollution, Politics, and International Law*, 333).

112. Resn A.542(13), 1983, Annex, Appendix 2.

113. Cowley, “The International Maritime Organisation,” 138–139; Secretariat of the Memorandum of Understanding on Port State Control, *Annual Report 1989* (The Hague: The Netherlands Government Printing Office, 1989), and Secretariat of the Memorandum of Understanding on Port State Control, *Annual Report 1988* (The Hague: The Netherlands Government Printing Office, 1988).

114. In only 17 percent of cases reported to IMO did flag states follow up on violations reported to them by coastal or port states. Only 6 percent actually were fined and “in these cases it is clear that the fines imposed on the vessel were too small to have a significant effect upon the vessel’s crew or master” (MEPC 29/10/3 (15 January 1990)), 5; also see the data in N. Smit-Kroes, *Harmonisatie Noordzeebeleid: Brief Van de Minister Van Verkeer en Waterstaat, Tweede Kamer der Staten-Generaal* 17–408, 23 September 1988 (The Hague: The Netherlands Government Printing Office), 5.

115. Paul Stephen Dempsey, “Compliance and Enforcement in International Law—Oil Pollution of the Marine Environment by Ocean Vessels,” *Northwestern Journal of International Law and Business* 6 (1984): 488.

116. Kirby, “The Clean Seas Code.”

through 1977 show that two-thirds of the world fleet essentially ignored the not-yet-in-force 1969 standards, and the other third failed to operate LOT efficiently enough to meet these standards.<sup>117</sup> In 1985, the National Academy of Sciences estimated that only 50 percent of all crude oil tankers were meeting the 1969 discharge standard.<sup>118</sup> Their 1990 estimates assume that, of tankers not facing equipment standards, 15 to 20 percent violate the total discharge standard.<sup>119</sup> Critics argue that even these compliance rates are “grossly exaggerated; indeed most estimates quote a figure of 80% upwards, when actual performance rates seem suspect.”<sup>120</sup> Recent Dutch and Belgian studies confirm that even in ports with reception facilities to receive waste oil, most oil wastes generated by tankers still get discharged at sea.<sup>121</sup> Indeed, as recently as 1989, tanker owners admitted that they do not always fully comply with MARPOL’s discharge requirements, although they blame it on the failure of governments to provide reception facilities.<sup>122</sup>

In contrast to the discharge standards alone, all available evidence suggests that equipment and construction standards have achieved essentially perfect compliance. Initial surveys of compliance with equip-

117. For the one-third figure see Pritchard, “Load on Top,” 214; and M’Gonigle and Zacher, *Pollution, Politics, and International Law*, 228. Data on the effectiveness of the load on top technique between 1972 and 1977 was presented to Congress in 1978. Since the 1969 rules only took legal effect in 1978, the oil companies were quick to point out that this data was not evidence of treaty violations. Indeed, the oil companies claimed the visible decreases in intentional discharges before 1978 were “a tangible measure of the voluntary progress . . . of the industry in advance of any formal regulation requiring such performance.” William Gray, “Testimony” in House Committee on Government Operations, *Oil Tanker Pollution—Hearings*, 95th Congress, 2nd session, House 401-8 (Washington, D.C.: GPO, 1978), 92.

118. National Academy of Sciences, and National Research Council, *Oil in the Sea*, 59.

119. The 1990 National Academy of Sciences (MEPC 30/INF.13, 12) study uses the MARPOL 73/78 distinction between the 1/15,000 standard for existing ships and the 1/30,000 standard for all new ships. Existing tankers using load on top are estimated to discharge 1/25,000 of total cargo capacity.

120. Pritchard, “Load on Top,” 218.

121. See P. Vanhaecke, *Verontreiniging Door Schepen* (Antwerp, Belgium: ECOLAS, 1990); and Marja den Boer et al., *Loos’-alarm: Afvalolie Van de Scheepvaart in de Waddenzee* (Groningen, The Netherlands: Werkgroep Eemmond Van de Landelijke Vereniging Tot Behoud Van de Waddenzee, 1987) which estimate that less than 15 percent and 35 percent, respectively, of tankers’ waste oils are actually received in port reception facilities.

122. MEPC 27/5 (17 January 1989).

ment and construction standards are required before issuance of the required International Oil Pollution Prevention certificate required by MARPOL 73/78 will be issued. Some governments conduct these surveys, while others rely on private classification societies. Since tankers are only built on order, ordering a boat without SBT would require a buyer to elicit cooperation in an admittedly illegal act from at least three other actors—a builder, a classification society, and an insurance company. Classification society representatives in shipyards reserve their highest classifications for ships built to all international requirements. While insurance companies do not link premiums to compliance with international rules, they do link them to classification, providing strong incentives for tanker buyers to conform with international rules. In essence, a tanker owner wants the highest classification and lowest premiums possible, and one element of securing them requires building to internationally required standards.<sup>123</sup> Since MARPOL 73/78, most governments also have broadened traditional safety inspections of tankers arriving in port to include pollution-related equipment and construction criteria. Some states have made use of the new MARPOL 73/78 enforcement language to detain, or bar the unloading of, ships found violating the equipment and construction standards—although such incidents appear to be quite rare.<sup>124</sup>

No study has examined actual compliance with the equipment and construction standards established by the 1973 Convention. However, two 1990 studies assume that 100 percent of tankers built after the requisite dates do have COW and SBT.<sup>125</sup> Ships that meet the SBT and

COW requirements are estimated to be significantly more likely to comply with the discharge standards. In contrast to the 50 to 85 percent figures the National Academy of Sciences has used for existing tankers, which barely meet the 1/15,000 requirement, the NAS estimates that 85 to 99 percent of new tankers with COW and SBT do better than required, achieving discharges averaging 1/50,000 and 1/100,000 respectively.<sup>126</sup> While ships with SBT and COW could still violate MARPOL's zonal and discharge proscriptions, retention of oil slops proves economically advantageous once the equipment has been installed.

Having examined the response of industry to international regulations, we must also examine government responses. The requirement for reception facilities seems to have induced little change in compliance. While developed countries generally have such facilities, oil-loading states—where discharging of the tank-cleaning and deballasting slops of a return voyage is most needed—have few. Violation of the requirement that governments “ensure provision” of reception facilities is evident from frequent complaints at IMO.<sup>127</sup> Indeed, the Red Sea and Persian Gulf, both designated as special areas in 1973, and the Gulf of Aden, designated in 1987, have yet to be “implemented” because of the continuing lack of adequate reception facilities.<sup>128</sup> The IMO's technical cooperation program has sought to encourage developed member states to provide developing states with the financial assistance necessary to build such facilities, but to date has made little progress.<sup>129</sup>

123. M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 330–331.

124. For example, in November 1990, the U.S. Coast Guard in Boston detained a Chinese tanker and ordered a Norwegian tanker to leave U.S. waters because the tankers violated MARPOL 73/78 requirements for existing tankers (William P. Coughlin, “2 Ships Barred from Unloading Oil in Boston,” *Boston Globe*, 1 November 1990).

125. Coast Guard inputs to the 1990 National Academy of Sciences study presumably support this assumption. MEPC 30/INF.13, 8. A study conducted for IMO makes a similar assumption. P. G. Sadler and J. King, “Study on Mechanisms for the Financing of Facilities in Ports for the Reception of Wastes from Ships” (Cardiff, Wales, 1990). Oil companies and classification societies do maintain databases which probably contain such data. However, neither IMO, national governments, nor private academics have made use of this data. Inter-

views during summer 1991 at IMO suggest that most experts are comfortable assuming that all new tankers meet the SBT and COW rules.

126. While the National Academy of Science estimates in 1973, 1985, and 1990 are widely cited, they provide little support for those elements of their oil pollution estimates which involve compliance (National Academy of Sciences, *Petroleum in the Marine Environment*; National Academy of Sciences and National Research Council, *Oil in the Sea*; and MEPC 30/INF.13).

127. See, for example, Resn A.585(14) (1985); “Cleaner Oceans: The Role of IMO in the 1990s,” *IMO News*, no. 3 (1990): 10; “Concern Over Lack of Reception Facilities,” *IMO News*, no. 1 (1984): 10; and MEPC 30/INF.30.

128. L. Andren and D. Liu, “Environmentally Sensitive Areas and Special Areas Under MARPOL 73/78,” in *IMAS 90: Marine Technology and the Environment* (London: Institute of Marine Engineers, 1990).

129. Sadler and King, “Study on Mechanisms.”

## Analysis

The preceding history allows us to identify and explain the agenda setting for, international policies on, and national and industry policy responses to, international control of oil pollution. The following section examines the role and effectiveness of the international environmental institution in influencing each of these elements. The section concludes by examining how effective the institution has been at solving the fundamental problem of oil pollution.

## Agenda Setting

Unilateral action has been the most frequent impetus placing international oil pollution onto the international agenda.<sup>130</sup> The threat or taking of unilateral action by countries controlling significant fractions of the oil or shipping markets has consistently preceded major international conferences. The following list summarizes the various examples which have been detailed above:

Conference	Preceding unilateral legislation
1926 Conference	U.K.: Oil in Navigable Waters Act, 1922 U.S.: Oil Pollution Act, 1924
1954 Conference	U.K.: Faulkner Report recommendations, 1953
1973 Conference	U.S.: Ports and Waterways Safety Act, 1972
1978 Conference	U.S.: Carter Initiatives, 1977

While in the 1920s the United States controlled some 60 percent of the world's oil exports, more recently the United States or United Kingdom has controlled a significant fraction (usually between 10 percent and 20 percent) of the oil import trade or the tankers that carry oil. The United States and British governments, under pressure from NGOs and their domestic public to take some action, pushed other states to discuss international oil pollution control either as a means to pacify domestic critics or in a more sincere effort to achieve an effective solution to an international problem. The United States or United Kingdom "would take the strongest possible position at the conference, mainly in order to please a domestic audience, but anticipating resistance from other major

130. Sielen and McManus, "IMCO and the Politics of Ship Pollution," 155.

maritime powers, it would prepare a number of fallback positions more acceptable to its own domestic commercial interests."<sup>131</sup> Given industry and maritime states' strong aversion to multiple regulations with respect to shipping, the threat of unilateral action would readily prompt a willingness by other states to at least discuss international regulation.

Unilateralism did not arise from any deep-seated governmental commitment to environmental protection, however. "Only domestic pressure from within the state has motivated governments—and maritime governments in particular—to advocate costly environmental initiatives. . . . All environmental initiatives at IMCO have been a direct result of democratic governments seeking international solutions to problems being loudly mooted at home."<sup>132</sup>

These domestic pressures in turn have been driven by two different processes. Until the *Torrey Canyon* grounded in 1967, it was not widespread public concern but pressures from small but loud domestic NGOs such as British bird protection societies, that induced governments to take unilateral action at home and seek international agreement abroad. Only one international environmental NGO, ACOPS, through its conferences in 1953, 1959, and 1968, played any significant role in heightening concern over the issue or initiating proposals for discussion at the subsequent international conferences. Since the 1970s, Friends of the Earth International has played a less visible role as the main environmental observer at MEPC meetings. While environmental NGOs have played little role in setting agendas, the International Chamber of Shipping played an important role in keeping oil pollution off the agenda by coordinating the voluntary agreement with the 1926 draft agreement. During the mid-1960s, oil companies themselves pushed oil pollution regulation onto the agenda, though they sought to have rules loosened, not strengthened.

131. Pritchard, *Oil Pollution Control*, 75. Congress and environmental groups have criticized the U.S. Coast Guard for not adopting stricter standards than those acceptable to the international community at IMCO and IMO. See, for example, Burton in House Committee on Government Operations, *Oil Tanker Pollution—Hearings*, 95th Congress, 2nd session, House 401–8 (Washington, D.C.: GPO, 1978), 4; and M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 119, 127.

132. M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 273, 285.

Since the late 1960s, however, it has been crises that have placed oil pollution on the agenda. While pollution from accidents has quite different causes and solutions than does intentional pollution, governments and IMCO/IMO have responded to general public pressures induced by accidents to also address operational pollution. A consistent pattern flows through the 1967 *Torrey Canyon* disaster leading to the 1969 Amendments and the 1973 conference, the spate of accidents in the winter of 1976–77 leading to the 1978 conference, and the 1978 *Amoco Cadiz* accident leading to France's 1980 hosting of the conference that produced the MOU on Port State Control. In contrast to the crises that have motivated the ozone debate (see Chapter 1), scientific assessments of "pollution in the marine environment have had little discernible influence on the timing or substance of decisions taken by IMCO."<sup>133</sup>

Getting oil pollution on the international agenda thus seems to depend considerably on factors exogenous to any actions by IMO. Yet, once on the agenda, the contractual environment has been enhanced by having an international organization to facilitate the transformation of international concern into international policy. In most cases, major new international policies have been agreed to at diplomatic conferences that might well have occurred even absent IMCO. Even in those

cases, however, IMCO supported the conferences, making them less dependent on the goodwill of an individual national government. Just as importantly, regular technical discussions within IMO committees have provided the foundations for successful conferences. Nations negotiated the 1969 amendments within the Subcommittee on Oil Pollution during the mid-1960s, and the 1984, 1987, and 1990 Amendments in the Marine Environment Protection Committee. The latter's regular meetings also "provided an amiable forum for regular consultations and negotiations," which facilitated agreement at the 1978 conference and have helped resolve numerous implementation issues.<sup>134</sup>

Nations and regional groups have universally deferred to IMO's exclusive cognizance over intentional oil pollution regulation, thus helping to achieve the preference of states and industry for uniform international regulations. Individual and regional groups of states have refrained from promulgating independent control measures for operational oil pollution.<sup>135</sup> The Paris and Oslo Conventions and the U.N. Environment Program regional seas agreements leave operational oil pollution control to IMO. The North Sea states have, to date, refrained from reducing discharge limits from 60 l/m to 30 l/m within the regional Bonn Agreement forum, preferring to propose such changes to the MEPC, where agreement would lead to their adoption globally rather than just regionally.<sup>136</sup> IMO's dominance in intentional oil pollution control encourages states to seek global rules before proceeding unilaterally or regionally.

In summary, global agreements have probably been easier to reach because of IMO and its ongoing pollution committee meetings than they would have been had negotiations only taken place within intermittent, ad hoc, regional conferences. If the exigencies of debating regulation at the global rather than regional level have made agreements weaker than they might otherwise have been, they have also made them more broadly applicable.

133. Sielen and McManus, "IMCO and the Politics of Ship Pollution," 154. A British House of Lords report on the dumping of waste at sea noted the divergence between scientific and political perceptions of environmental problems: "The Committee have been struck by the lack of scientific evidence to support the proposal [an EC Council Directive (8805/85) on dumping of waste at sea]. . . . There is of course, no dispute that the dumping of certain wastes in large enough quantities causes pollution. . . . But there seems to be little scientific evidence of pollution attributable to present dumping practices. Alternatively pollution may be assessed 'politically', that is to say judgments may be taken that the risk of abuse of the disposal system is unacceptably high or, in accordance with the precautionary principle, that the risk of pollution is unacceptable because pollution, once identified, could be irrevocable. . . . The public have a natural and reasonable concern about the long-term consequences of waste disposal practices. In this area where scientific proof is difficult—it is easier to prove the positive, that damage has occurred, than the negative, that damage will not occur—public acceptance of waste disposal methods is vital." U.K. House of Lords, and Select Committee on the European Communities, *Dumping of Waste at Sea: With Evidence*, Session 1985–86, 17th Report. (London, England: Her Majesty's Stationery Office, 1986), 21.

134. Sielen and McManus, "IMCO and the Politics of Ship Pollution," 152–153.

135. Only the United States has imposed rules stricter than those set internationally (Cowley, "The International Maritime Organisation," 134).

136. MEPC 31/5/1 (4 April 1991).

### International Policies

Once an issue is on the agenda, we need to look at the effectiveness of an international environmental institution in producing international policies. First, we can ask, how effective have international efforts been at achieving negotiated agreements? These efforts have been quite successful. Since 1926, delegates have achieved five major agreements (1926, 1935, 1954, 1973, 1978) and as many amendments (1962, 1969, 1984, 1987, 1990). But signatures proved elusive until 1954. Even after signature, necessary ratifications have been consistently slow throughout IMO's history. All conventions and amendments have required ratification by a majority of the world's shipping fleets before entry into force. While this delays entry into force, it ensures that once in force, an agreement has at least the nominal support of the major players. The pattern in oil pollution suggests that the delegates to an international conference tend to be more environmentalist than their governments (hence the draft 1926 and 1935 agreements) and that negotiation and signature of conventions confer more domestic political benefits than does the administrative chore of ratification (hence the long ratification delays).

Since the tacit acceptance procedure adopted in the 1973 Convention became operational in 1983, it has improved this process considerably. IMCO/IMO has regularly passed resolutions, and its secretary-general has at times made concerted efforts, calling upon states to speed up ratification of existing conventions.<sup>137</sup> However, these have had little apparent impact on the domestic political factors, often including low levels of concern and long bureaucratic processes, that impede ratification. Eliminating the need for two-thirds of signatory states to ratify, the tacit acceptance procedure incorporated into most IMO conventions involves a technical amendment's entry into force within sixteen months of its adoption so long as no more than one-third of these states, representing more than fifty percent of world shipping tonnage, submit objections. This allows entry into force procedures to take advantage of, rather than fall victim to, bureaucratic and political inertia. Certainly, part of the improvement since 1983 (see chart below) reflects the less substantively controversial nature of the amendments adopted in the

1980s. However, it seems unlikely that even these amendments would have entered into force so quickly absent the tacit acceptance provision.

Agreement	Period until entry into force
1926 Agreement	Never signed or ratified
1935 Agreement	Never signed or ratified
1954 Convention	4 years
1962 Amendments	5 years
1969 Amendments	9 years
1973 Convention	10 years
1978 Convention	5 years
1984 Amendments	16 months
1987 Amendments	16 months
1990 Amendments	16 months (expected)

A signed and ratified convention is not necessarily equivalent to an effective one, however. We must ask, would the treaty rules solve the problem? During the first two stages of oil pollution control, the answer is definitely no. Even though many negotiators thought oil persisted indefinitely, they could only agree to the palliative adoption of a zonal approach. Indeed, the zonal approach initiated in 1926 was changed little until 1969, suggesting that initial solutions wield strong influence over the approach underlying subsequent agreements. Early agreements reflected the dominance of shipping and oil interests. Once IMCO was formed, it immediately fell victim to "regulatory capture," and it became commonplace to think of the IMCO as a "shipowner's club."<sup>138</sup> International policies either reflected the lowest common denominator positions of major maritime nations with little concern over oil pollution, as in 1954, or reflected the strong interests of shipping and oil companies in averting stringent measures while ensuring that all policies adopted were universal in character, as in the voluntary agreement of the 1920s and 1930s and the legitimization of LOT in the 1969 Amendments. Negotiators depended on industry for information regarding the costs and feasibility of all the solutions to the oil pollution problem. However, the lowest-cost options that industry proposed eventually proved ineffective.

It took the increased strength and breadth of environmentalism in the late 1960s and early 1970s to alter the bargaining structure of the prob-

137. See, for example, Resn. A.119(V) (1967) and Resn. A.347(IX) (1975).

138. Sielen and McManus, "IMCO and the Politics of Ship Pollution," 141.

lem. International agreements now reflected the product of negotiations between a coalition of developed states facing domestic pressures and developing states, seeking to extend “their general rights of regulation,”<sup>139</sup> and an opposing coalition of governments representing shipping and oil interests and those industries themselves, seeking the lowest-cost, most politically viable, international alternative. The former coalition had gained strength by the early 1970s due to three factors. First, oil pollution had grown with the dramatic growth in oil transported by sea. Second, the United States, due to domestic environmentalist pressures, assumed a leadership role in pressing for international action on the environment. Third, desiring to create precedents for extended jurisdictional claims in pollution control that would influence the Law of the Sea negotiations, new developing state members of IMCO supported regulations that, while having few direct benefits, also imposed no direct costs. The conflict of interests between environmentalists and shipping concerns was as strong as ever, but the former had gained in numbers and power. These conditions were essential to breaking the shipping interests’ control of IMCO in 1973. However, by 1978, the first coalitions’ weak commitment to environmental protection was highlighted by the unwillingness to support the expensive U.S. proposal to retrofit SBT on all ships.

Notwithstanding the above, IMO and its member states have learned from their mistakes. The equipment approach adopted in MARPOL 73/78 was a response to the perceived failure of the existing performance standards and the load on top technique. Consider what policies the environmentalist pressures of the 1970s would have produced absent the poor compliance of the 1950s and 1960s. Conferences would have been held and agreements reached, surely. International policies might even have involved strict performance standards. However, it seems unlikely that countries would have switched immediately from no international regulation to expensive equipment standards.

Effectiveness can also be evaluated by the scope of the policies adopted. This involves both the number of countries involved and the definition of the problem. International efforts to address oil pollution have broadened dramatically over the years. What began as a thirteen-

139. Grolin, “Environmental Hegemony,” 33.

country negotiation in 1926 has become an ongoing negotiation of over seventy countries. The breadth of agreement has also increased in terms of the sources of marine pollution addressed. While only operational oil discharges from tankers have been discussed in this article, international regulation has broadened to encompass other pollution sources. While initial regulatory efforts involved only operational discharges from tankers and non-tankers, after the *Torrey Canyon* disaster, IMCO and the oil industry began addressing accidental pollution under several government and industry agreements.<sup>140</sup> The 1973 Convention exploded the scope of regulations—they now applied to oil-drilling platforms at sea and also addressed other pollution from ships, including chemicals, hazardous packaged substances, garbage, and sewage. Problems that have remained outside IMO’s purview, due to its focus on shipping, are the oil and other pollutants generated from land-based sources. IMO has not attempted to address these issues. The number of countries attending relevant conferences is shown below.

Year of conference	Number of countries attending
1926	13
1954	32
1962	38
1973	71
1978	58

**National and Industrial Policy Responses**

In trying to assess how international oil pollution control has affected the behavior of international actors, we can look at both enforcement

140. These include private industry conventions—the Tanker Owners Voluntary Agreement Concerning Liability for Oil Pollution (TOVALOP, 1969), and the Contract Regarding an Interim Supplement to Tanker Liability for Oil Pollution (CRISTAL, 1971)—and intergovernmental conventions—the Intervention Convention on Civil Liability for Oil Pollution Damage (1969), the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (1969), and the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (1971). M’Gonigle and Zacher, *Pollution, Politics, and International Law*, (chapter 5) provide an excellent analysis of the negotiation of these conventions. It is worth noting that the deference shown by regional groups of states to IMO on operational oil pollution has not carried over into accidental oil regulation. Various regional agreements have been arrived at to address the local impacts and cleanup arrangements needed for major oil spills.



**Table 5.4** Number of ships detained or barred from entry, countries reporting during 1988–1990

Country	1988	1989	1990
Australia	0	0	0
Bulgaria	0	0	1
Canada	0	0	NA
China	0	0	0
Egypt	0	0	NA
Germany (East plus West)	0	0	11
Greece	0	0	0
Hong Kong	0	0	0
Japan	0	0	0
Norway	1	0	1
United Kingdom	47	2	3
United States	339	10	14
Total	387	12	30

Sources: MEPC 29/10 (1989), MEPC 29/10 Add.1 (1990), MEPC 30/17, (1990), MEPC 30/17 Add. 1 (1990), MEPC 30/17 Add. 2 (1990), MEPC 30/17 Add. 3 (1990), MEPC 31/16 (1991), MEPC 32/14 (1991), and MEPC 32/14/Add.1 (1991).

and compliance. In the latter, four different patterns emerge in this case: (1) no change, (2) spurious change, (3) preemptive change, and (4) rule-induced compliance.

The resources governments dedicate to enforcing oil pollution rules appear to be little affected by international requirements to enforce. While required to detain ships threatening the marine environment under MARPOL, the table above shows that most states rarely do so, seeing the provision as a right, not an obligation.

Table 5.4<sup>141</sup> also supports other analyses suggesting that most states ignore IMO's annual reporting requirements on enforcement activity, with only five to fifteen of some sixty signatory states providing reports

141. Sources: MEPC 29/10 (6 November 1989), MEPC 29/10/Add.1 (9 February 1990), MEPC 30/17 (20 July 1990), MEPC 30/17/Add.1 (16 August 1990), MEPC 30/17/Add.2 (4 October 1990), MEPC 30/17/Add.3 (11 October 1990), MEPC 31/16 (18 April 1991), MEPC 32/14 (13 November 1991), and MEPC 32/14/Add. 1 (6 December 1991).

in a given year.<sup>142</sup> IMO also fails to use the reports it does receive, merely copying and distributing them, with little analysis or effort to make the data comparable. Only in 1985 did IMO establish a standard format to facilitate comparison of enforcement data between different countries over time.<sup>143</sup> Discussion of enforcement and compliance is often postponed and states rarely "call each other on the carpet" for lax compliance or lax enforcement.<sup>144</sup> While governments do not attempt to shame other governments, industry often harangues governments for failing to supply adequate reception facilities, and environmental NGOs often criticize lax government enforcement.<sup>145</sup> The fact that most states conduct little if any enforcement, while the United States, Japan, and Canada have quite strong enforcement suggests that domestic political factors, rather than IMO requirements, determine enforcement. The Memorandum of Understanding on Port State Control provides an exception, where international cooperation has increased the attention and resources states dedicate to enforcement.<sup>146</sup> European states facing similar domestic pressures for environmental improvement to the United States and Canada required the cooperation reflected in the MOU to reassure themselves and each other that all countries would increase their levels of enforcement together. This allowed states to increase their enforcement without fear of free-riding by others. While states have failed to achieve the 25 percent inspection targets established in the MOU, all members have increased their enforcement efforts.<sup>147</sup> However, continuing problems within the MOU highlight the

142. Paul Stephen Dempsey, "Compliance and Enforcement," 487.

143. MEPC/Circ.138 (15 May 1985).

144. Information on how IMO uses its enforcement data was collected through interviews at IMO during summer 1991.

145. MEPC 30/INF.30, MEPC 29/10/3, and 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).

146. Kasoulides, "Paris Memorandum of Understanding," *Marine Pollution Bulletin* 20 (June 1989): 255–61.

147. Secretariat of the Memorandum of Understanding on Port State Control, *Annual Report 1990* (The Hague: The Netherlands Government Printing Office, 1990). Indeed, like pollution compliance itself, enforcement presented these nations with a classic public goods problem which the MOU helped resolve. See Kenneth Waltz, *Theory of International Politics* (Reading, Mass.: Addison-Wesley, 1979), 196, and Henk E. Huibers, "Statement to the Seminar on Port

costs and evidentiary problems involved in policing performance standards. Even with visible evidence of a violation, linking that evidence with a particular ship remains difficult.<sup>148</sup>

MARPOL 73/78 did improve enforcement in one major way, however. That improvement came from switching from performance standards to equipment standards. While this switch did not increase any state's interest in enforcing oil pollution regulations, it did make effective enforcement easier and cheaper for those states interested in enforcing. With equipment rules, violations are easy to detect during regular port inspections. Just as important, under the legal changes in 1973, port states can bar ships suspected of violations from their ports and detain ships that threaten the marine environment. This authority provides those developed port states having domestic political incentives to enforce with the potent sanctions needed to induce compliance.

In the area of compliance, "no change" best describes the response of governments to reception facility requirements. Since 1954, the obligation to provide facilities has been neither strong nor clear. MARPOL only requires that governments "ensure provision" of facilities; governments prefer to impose this expense on industry while industry argues that they must spend large sums complying with MARPOL equipment requirements and should not also have to finance reception facilities. Very little of the Technical Cooperation Program funding has been used to build reception facilities. While the number of reception facilities worldwide has increased over the years, many ports still have inadequate facilities to receive oil wastes, thus providing rationales, if not reasons, for tanker captains to continue discharging at sea. "No change" also describes industry responses prior to the early 1960s. While no hard evidence exists, the voluntary agreements prior to 1954 and the zones under the 1954 agreement seem unlikely to have substantially changed shipping behavior. National legislation, especially in the United States, and improvements in tanker design and construction techniques adopted for other reasons during the 1930s and 1940s, easily account for reduced U.S. concern about oil pollution at the 1954

Conference.<sup>149</sup> Continued British concern suggests that discharges remained the standard procedure for most of the industry.

Spurious change is change that correlates with rule changes but is caused by other factors. Oil has traditionally been discharged at sea because the costs of retrieval have usually exceeded the economic value of doing so. As oil prices increased, shipping and oil company interests in retrieval followed. Can this increase explain the change in the type of tankers purchased? In the case of crude oil washing, the answer is yes. By cleaning tanks with crude oil during unloading, COW reduced the amount of oil lost between initial loading and final delivery. While installing a COW system would have cost a company \$5,500 per voyage at the 1972 price of oil, it would have saved the company \$9,000 per voyage at the 1976 price of oil.<sup>150</sup> This certainly explains why some tanker owners installed COW equipment even prior to the dates required by MARPOL.<sup>151</sup> COW was adopted after it became technically available but before it was internationally required, suggesting that the pre-MARPOL adoption was due to the oil price rise. However, COW installation did involve front-end capital costs of about \$400,000.<sup>152</sup> While most owners would eventually have installed COW, many owners would have deferred such an investment absent international regulations.<sup>153</sup> While no detailed data exists on when ships retrofitted with COW, logic suggests that MARPOL probably led industry to install COW more widely and quickly than it would have done otherwise. Similarly, load on top, which oil companies had been promoting since

149. Pritchard, *Oil Pollution Control*, 64.

150. Based on a recalculation of the data in table 7-4 of 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), 124, with 1972 oil prices of \$21 per ton (1976 dollars) substituted for the figure of \$80 per ton (1976 dollars) used in their calculations. These savings would have grown as the price of oil continued to rise in the late 1970s.

151. M. G. Osborne and J. M. Ferguson, "Technology, MARPOL and Tankers—Successes and Failures," in *IMAS 90: Marine Technology and the Environment* (London: Institute of Marine Engineers, 1990), 6-2, M'Gonigle and Zacher, *Pollution, Politics, and International Law*, 131.

152. Waters, Heaver, and Verrier, *Oil Pollution from Tanker Operations*, 99.

153. More accurate annual data on COW installations would allow us to discriminate between those tanker owners who installed COW for economic reasons prior to MARPOL requirements and those who did so only on the schedule laid out in MARPOL 73/78.

State Control" in *Report on the Joint IMIF/MOU Seminar on Port State Control* (London: International Maritime Industries Forum, 1991).

148. Smit-Kroes, *Harmonisatie Noordzeebeleid*.

the early 1960s, was practiced far more efficiently after the OPEC oil price increase of 1973 than it was before. In these cases, economics rather than international law explains behavior change.

Preemptive change by industry has also occurred. The development and adoption of LOT during the 1960s involved a major change in tanker operations, though by no means a technological breakthrough,<sup>154</sup> and was a direct response to the 1962 conference.<sup>155</sup> Given their stability from the 1940s through the 1960s, oil prices can not explain oil companies' discovery in 1963 that tankers could reduce waste by combining new cargoes with the oil residues from a previous ballast voyage. Rather, it was these interests' desire to derail growing pressure for equipment requirements, and international pressures to reduce oil pollution, that explain development and promotion of LOT as a better alternative which eliminated the need for expensive oily-water separating equipment and the long delays needed to discharge slops in reception facilities. While LOT did reduce discharges and was a response to international action, LOT remained, at least until the 1969 Amendments entered into force in 1978, an admitted violation of the 1962 discharge prohibitions for new tankers.

Finally, segregated ballast tank adoption in the late 1970s provides an example of rule-induced compliance. Very few tankers built prior to the MARPOL dates have SBT; almost no tankers built since those dates are without it.<sup>156</sup> Economics argued against complying with the SBT standards. A new SBT tanker costs 5 to 10 percent more than an equivalent non-SBT tanker. It also reduces the tanker's carrying capacity, further increasing transportation costs. Overall, SBT increases ship costs by almost \$1,600 per voyage at 1976 oil prices.<sup>157</sup> In short, SBT required that money "be invested with an anti-economic result" and placed the owner at a competitive disadvantage.<sup>158</sup> Tanker owner be-

havior confirms this analysis: MARPOL required existing tankers to retrofit either COW or SBT and the vast majority have opted for COW rather than SBT. Taken together, this evidence suggests that the international requirement for SBT has been largely responsible for the technology's adoption.

SBT proved far more effective at changing behavior than did discharge regulations, for three reasons. First, unlike discharge regulations, violations of equipment requirements could be readily detected. Second, the treaty provided port states with the legal authority to detain in their ports any ships violating these regulations. While few states have proven willing to take such actions, at the time of construction, an owner could not be sure how few states that would be, or what share of the market they would represent. Therefore, in buying a ship without SBT, an owner was taking a large risk of being forced to retrofit or losing the tanker altogether. Third, the ease of detecting and prosecuting equipment violations also eliminated each tanker owner's fear that complying would place him at a competitive disadvantage. In contrast to discharge standards, each owner could be confident that no other owner could get away with an equipment violation. While SBT was expensive, this fact removed the strong and continuing incentives to violate that even a conscientious tanker owner faced with respect to discharge standards. Indeed, "mitigation of competitive disadvantage is so central to the shipping industry's perception of IMCO that it is this factor, probably more than any other, that has brought the maritime community to embrace costly requirements it would not have otherwise been willing to accept."<sup>159</sup> Having said this, however, most tankers had no reason to support SBT requirements absent international pressures for environmental protection. And, as already noted, once SBT or COW is installed, compliance with the performance standards can, relatively safely, be assumed.

154. Indeed, the 1953 Faulkner report elaborated all the major elements of the procedure except for the combining of slops with subsequent loads of cargo.

155. Kirby, "Background to Progress."

156. Clarkson Research Studies, *The Tanker Register* (London: Clarkson Research Studies, Ltd., 1990).

157. Waters, Heaver, and Verrier, *Oil Pollution from Tanker Operations*, 92-94, 124; and Sadler and King, "Study on Mechanisms," 6.

158. Studies at the time concluded that even after accounting for social be-

nefits, SBT adoption was unjustified. See, for example, Waters, Heaver, and Verrier, *Oil Pollution from Tanker Operations*, 136; MEPC VI/Inf.7 (6 September 1976), and MEPC V/Inf.4 (8 March 1976), A18-A19. See also Osborne and Ferguson, "Technology, MARPOL and Tankers", 6-2.

159. Sielen and McManus, "IMCO and the Politics of Ship Pollution," 154.

### Institutional Effectiveness

We now need to ask, how effective has this international environmental institution—its rules and procedures—been in solving the problem? The answer involves addressing at least three subsidiary questions. First, what definition of “the problem” should be used as the metric for effectiveness? Second, given a certain definition, has that problem been mitigated? Third, to what extent and by what means did the institution contribute to that mitigation?

How was the problem defined and against what standard should the institution’s effectiveness be measured? While others could be used, I believe the most appropriate basis for evaluation is success in reducing intentional oil pollution from tankers—a standard that has been one of the nominal goals of the institution since the 1920s. From then until the late 1960s, international action sought to address coastal oil pollution due to intentional discharges from ships. The international environmental institution has gone on to expand the definition of the problem in some directions but not in others. After the *Torrey Canyon* accident of 1967, IMCO and the nations that had negotiated the 1954 Convention and 1962 Amendments began to address accidental oil pollution. The 1973 MARPOL Convention expanded in scope to include chemical, garbage, and sewage pollution from tankers and to apply relevant tanker regulations to oil platforms. Current discussions are under way to regulate air pollutants generated by ships.<sup>160</sup> International attempts were not made within this framework to address land-based sources of oil pollution, a problem that has been left to other, regional institutions. The institution could be judged on its success or failure at addressing any one of these other important environmental problems. However, a fair evaluation of any of these efforts would require an equally lengthy analysis of the institutional history involved. Therefore, the following analysis answers the first question by evaluating the effectiveness of the international institution at reducing intentional discharges. While it is no longer the only problem, it has remained a major problem addressed in the institutional framework.

This raises the second question, is there any evidence that intentional

discharges have decreased? Unfortunately, consistent efforts have not been made to collect high-quality data on oil pollution, whether by measuring oil found on beaches, oil content in ocean water, or even the number of operational oil spills. Indeed, perhaps the first criticism we can make of institutional effectiveness is that the institution has not established a research program to better understand the size and nature of the oil pollution problem and its change over time. Table 5.5 shows British and Dutch data that shed some light on the problem. The British data suggests a significant decrease in discharge incidents in port between 1961 and 1974 when normalized to tanker traffic (tonnage and number of ships), but provides no data on coastal and high seas spills or on observation efforts. The Dutch figures on observed North Sea spills show no significant decline between 1969 and 1988 when normalized to observation time, but do not account for tanker traffic.<sup>161</sup> Neither data set successfully excludes double counting of the same spill by different observers or clearly separates accidental from intentional spills. In 1989, a comprehensive Dutch study found that “the density of oiled sea birds found dead on the Dutch coast has fluctuated during the last forty years, and it has not decreased significantly”.<sup>162</sup> In short, direct data has not been collected in a way sufficiently rigorous and systematic to clearly show whether coastal oil pollution or water quality has been decreasing or not.<sup>163</sup>

Rather than trying to observe oil pollution once it is introduced into the ocean, most analysts have attempted to estimate the amount of oil that tankers could be expected to discharge each year. The best estimates were based on oil company surveys conducted in the mid-1970s. Data collected by oil companies on oil retained aboard tankers showed that most tankers were not using LOT efficiently and that an average of 0.1 to 0.3 percent of a tanker’s cargo, and hence of total seaborne trade, was discharged at sea. This produced estimates of operational discharges totaling 3.5 to 5 million tons per year.<sup>164</sup> Most analysts,

161. Smit-Kroes, *Harmonisatie Noordzeebeleid*.

162. Camphuysen, *Beached Bird Surveys*, 13.

163. Satu Nurmi, “Issues and Problems in the Protection of the Marine Environment,” in *International Environmental Diplomacy: The Management and Resolution of Transfrontier Environmental Problems*, John E. Carroll, ed., (Cambridge: Cambridge University Press, 1988), 208.

164. Arthur McKenzie, “Letter to the Honorable John L. Burton,” in House

160. Y. Sasamura, “Prevention and Control of Marine Pollution from Ships.” (Paper prepared for the 25th Annual Conference of the Law of the Sea Institute, Malmö, Sweden, 1991).

Table 5.5 A. Milford Haven oil spill statistics

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Spills detected	45	33	28	34	83	72	50	52	58	55	49	56	48	43
No. of ships in port	1066	1192	1236	1392	1985	2378	2680	2669	3266	3359	3490	3465	3886	4200
Spills per 100 ships	4.2	2.8	2.3	2.4	4.2	3.0	1.90	1.9	1.8	1.6	1.4	1.6	1.2	1.0
Million tons of oil	9.9	11.5	13.0	17.7	24.9	28.9	28.2	30	39.9	41.2	43.2	45.7	53.1	59.2
Spills per million tons	4.5	2.9	2.1	1.9	3.3	2.5	1.8	1.7	1.4	1.3	1.1	1.5	0.9	0.7

Source: Dudley, 1976, 29.

## B. Dutch sector of the North Sea oil spill statistics

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988		
Oil spills	24	96	145	105	151	128	154	187	692	488	500	376	660	466	1024	649	571	378	535	429		
No linked to ships								100	127	82	47	74	77	107	92	72	62	70				
Detection rate								14%	26%	16%	13%	13%	11%	17%	10%	13%	13%	16%	13%			
Total slicks per hour of observation																	2.4	1.3	1.2	0.9	1.2	0.8
Vessel slicks per hour of observation																	0.12	0.06	0.06	0.08	0.13	0.13
Platform slicks per hour of observation																	0.13	0.06	0.07	0.03	0.04	0.02

Source: Camphuysen, 1989, 41 and 248.

largely due to lack of empirical data, have assumed LOT was both more widely and more efficiently used, and have estimated annual discharges in a range below 2 million metric tons. Although the accuracy of any of these estimates is subject to doubt, in the absence of better data, the range of expert estimates graphed in figure 5.1 suggests a decline in intentional oil pollution from ships, with the most notable decrease occurring after the mid-1970s. Perhaps more convincingly, the three National Academy of Sciences estimates also show a steady decline in intentional discharges.

Many analysts estimate reductions and attribute them directly to the international efforts to control oil discharges. In 1965, oil companies claimed that LOT had eliminated 60 percent of the estimated one million metric tons (Mt) of oil discharged annually.<sup>165</sup> A 1990 study concluded that "if there were no international pollution control, the annual amount of oil discharged from tankers could be as high as 6 Mt; if MARPOL 73/78 were strictly adhered to, this figure could be as low as 0.1 Mt. The actual figures could lie between 6 and 0.1 Mt, but the author optimistically assumes that it would be much nearer to the latter figure at present and could be further reduced in the future."<sup>166</sup> Similarly, a 1990 study by GESAMP concluded that MARPOL "regulations have resulted in a major reduction of operational pollution, not only from tankers but also from all other types of vessels."<sup>167</sup>

Without putting much faith in such assertions, the above analysis of industrial responses supports the accuracy of their direction if not their magnitude and the attribution of the adoption of SBT, and some adoption of LOT and COW, to international regulations. Since proper use of each technology does reduce oil discharges, and there is evidence that compliance has been quite high with SBT and COW, their adoption should have produced corresponding decreases in total oil inputs to the ocean. Indeed, their continuing phasing into the fleet over the past and

next two decades will eventually account for major reductions in the intentional oil pollution that initially prompted international action. Without quantifying these reductions or the share for which the international institution is responsible, we can have some confidence that the world's oceans receive less oil from ships today than they would have absent these efforts. The lack of data demonstrating unambiguous reductions in oil slicks or sea bird deaths may be due to poor data, an inability to distinguish intentional discharges from other sources, and the fact that ships required to have SBT under MARPOL 73/78 still represent only 20 percent of the current world fleet.<sup>168</sup> Major observable environmental improvement from MARPOL 73/78 may await the total replacement of the fleet in the early twenty-first century, and enhanced control of other oil sources.

How did the institution overcome the obstacles that initially prevented effective action? What does this experience suggest about the value of increasing concern over, enhancing the contractual environment of, or improving national capacities to address, international environmental problems?

**Increasing Concern** Most intergovernmental action has reacted to, rather than stimulated, concern over intentional oil pollution. Domestic nongovernmental organizations in both the United States and the United Kingdom have consistently played a significant role in raising the salience of oil pollution, widening public support, and pressuring lawmakers. Indeed, international concern has almost always been evinced by unilateral action by the United States or the United Kingdom, which in turn has been driven by domestic pressures. During the 1950s and 1960s, a single international NGO, ACOPS, also played a role in increasing attention to the issue by holding independent conferences.

Early on, most states, especially those with shipping and oil interests, viewed oil pollution as not enough of a problem to warrant strong international action. During the 1950s and early 1960s, British concern, due mainly to NGO activism, was high enough to prompt calls for action,

Committee on Government Operations, *Oil Tanker Pollution—Hearings*, 95th Congress, 2nd session, House 401-8. Washington, D.C.: GPO, 1978).

165. SCOP I/21, (1965), 6.

166. Y. Sasamura, "Oil in the Marine Environment," in *IMAS 90: Marine Technology and the Environment* (London: Institute of Marine Engineers, 1990), 3-6.

167. GESAMP 1990, 21.

168. Lloyd's Register of Shipping, *Statistical Tables* (London: Lloyd's Register of Shipping, 1990), and Sadler and King, "Study on Mechanisms," 19.

but not widespread enough for the government to take strong measures. International action provided a means to weaken rather than widen the application of stringent pollution control. Even if compliance with 50-mile zones had been adequate to eliminate coastal oil pollution, enforcement measures would have failed to ensure compliance. It took increased concern, ignited by major oil spills in the late 1960s and 1970s and fanned by NGOs, their expression in threats of tough unilateral U.S. action, and wider support for such measures as the oil problem and other countries' concern over it grew, to shift the bargain from industry control over international policies to negotiation between industry and environmental concerns. Equally strong concern in less powerful states would have been unlikely to overcome the resistance or indifference of most states; indeed, major maritime states failed to support many U.S. proposals, though they eventually signed and ratified agreements containing those that passed. At the same time, if high concern in the United States had not found support in other states, the weak policies that had been the outcome of the British efforts in the 1950s and 1960s would have continued. While U.S. concern and unilateralism was crucial to adoption of stringent control measures, U.S. action alone would likely have failed to achieve the same results absent international agreement. Industry would probably have responded to exclusively unilateral U.S. requirements for SBT by equipping enough ships with SBT to service the U.S. market, rather than equipping all ships with SBT. The United States also could have attempted to achieve more stringent rules among fewer countries through bilateral agreements, but this would have involved far higher transaction costs than did the use of IMO meetings and associated conferences. It required the combination of strong concern in a major power coupled with a background level of concern in other states to overcome the resistance of shipping and oil interests that had preempted stringent international control prior to 1973.

The British and Americans, during their various phases as leaders of international action, consistently chose to compromise and achieve near-term regulatory rules within the constraints of current levels of concern, rather than to opt for a framework agreement reflecting general norms. They did not press for an ongoing research program to overcome low concern in hopes of developing support for stronger measures

in the long term. Research into the impacts of oil pollution have neither been promoted by, nor had much influence on, the international institution. Indeed, scientists have found little conclusive evidence that oil pollution has major environmental impacts beyond the readily visible ones of oiled resort beaches and dead sea birds. Therefore, an extensive research program would likely have done little to speed up the process of increasing concern that eventually led to adoption of strong international rules. Research into technologies to reduce discharges might have proved helpful, however, in reducing international dependence on industry development of, and reluctance to release information regarding, options like LOT and COW which promised environmental benefits.

Thus, stringent controls depended on strong concern in a major developed state, its expression in a willingness to take unilateral action and to bring diplomatic pressure to bear, and a willingness among many other states to support such measures for many reasons—including, but by no means limited to, concern over coastal pollution. While strong concern has been a precondition for effective rules, the institution has done little to promote the growth of such concern.

**Enhancing the Contractual Environment** International efforts to control oil pollution have achieved greater success by enhancing the contractual environment for international agreement. By holding regular committee and subcommittee meetings and sponsoring diplomatic conferences, IMCO has provided a forum where nations could raise their views and concern regarding oil pollution and current or proposed solutions. These forums have facilitated global rather than regional or unilateral regulation, an outcome also preferred by oil and shipping interests. While this approach produces less stringent measures at a slower pace than “leaders” and many environmentalists might prefer, it has produced more stringent rules than most states would have promulgated absent international agreement. For example, while the double bottoms promoted by the United States in 1973 were never required internationally, tankers from most states would still be unlikely to have SBT absent the MARPOL 73/78 accord. The Subcommittee on Oil Pollution facilitated discussions of LOT in the 1960s, and the Marine Environment Protection Committee conducted extended discussions on retrofitting SBT in the 1970s and on amendments since

1978, thus helping to work out the technical details essential to implementing the oil pollution agreements effectively.

The institution also learned from past experience to make it easier for agreements to enter into force and for nations to enforce agreements. After decades of excruciatingly slow ratification processes, adoption of the tacit acceptance procedure dramatically reduced the time between amendment adoption and entry into force. MARPOL adopted not merely a more stringent, but a fundamentally different, equipment-based, approach to oil pollution control because of the dismal record of discharge standards, which had proved ineffective not because they were too lenient—MARPOL left them largely unchanged—but because violations were hard to detect or sanction effectively. MARPOL established equipment standards that increased the effectiveness of enforcement resources and removed the international legal impediments to effective enforcement. Requirements for SBT and COW also helped reassure otherwise conscientious tanker owners that their compliance would not be matched by clandestine violations by others, leaving them at a competitive disadvantage. The institution dramatically increased the transparency of oil pollution control through adoption of these measures.

IMO has been relatively unsuccessful, however, at enhancing transparency regarding, and thereby increasing, governmental enforcement. Most states regularly ignore IMO's reporting requirements. Outside of the Memorandum of Understanding, little concerted effort has been made to improve enforcement of IMO conventions. Enforcement continues to depend on the domestic political incentives states have to expend resources on monitoring and sanctioning violations.

**Increasing Capacity** Finally, the institution has a mixed record at increasing the capacity of states to address oil pollution. IMO and developed states concerned about the problem have done little to increase the capacity of developing states to address intentional oil pollution. The failure of many governments to comply with the requirement to ensure provision of adequate reception facilities has provided tanker operators with an excuse for discharging oil at sea. Yet, the voluntary financial assistance measures under IMO's Technical Cooperation

Program have rarely been used to fund installation of reception facilities, or to pay for enhanced enforcement, in developing countries.<sup>169</sup>

More than from increasing capacity, IMO has achieved progress by reducing barriers to the effective use of states' existing capacities. Initial reliance on flag state enforcement inhibited successful prosecution of discharge violations. While the MARPOL 73/78 provisions allowing port states the right to fully inspect ships and to detain those posing a threat to the marine environment did not create new incentives for enforcement, they did remove barriers restraining port states that had existing incentives to enforce. Full inspections have become commonplace, and some states have detained ships for equipment violations—procedures which were unheard of prior to removal of the jurisdictional barriers that were still reflected in the 1969 Amendments. MARPOL's shift from discharge standards to equipment standards enhanced enforcement capacity by ensuring that the relatively few states willing to enforce treaty provisions had the legal authority and practical ability to do so.

### Conclusions and Lessons

International efforts to control intentional oil pollution from ships had essentially no impact on improving the marine environment until the rules promulgated in the 1973 and 1978 agreements came into force. The institution succeeded by improving the contractual environment to facilitate global agreements, and by removing the barriers to states' ability to exercise their capacity to enforce those agreements. The institution's success awaited, rather than created, concern over oil pollution. Stringent measures were agreed to only after strong public concern in a powerful country like the United States met with willing support from

169. This continuing problem produced a call within the Preparatory Committee for the United Nations Conference on Environment and Development to raise \$80 million per year for oil reception facilities in developing countries (UN Document A/Conf.151/PC/100/Add.21 United Nations, and Preparatory Committee for the United Nations Conference on Environment and Development, *Protection of Oceans, All Kinds of Seas Including Enclosed and Semienclosed Seas, Coastal Areas and the Protection, Rational Use and Development of Their Living Resources* (New York, N.Y.: United Nations, 1991).



states concerned over the problem or little affected by the proposed solution. Having regular international meetings delayed and diluted, but also broadened, the impact of these proposals. Adoption of tacit acceptance procedures helped bring these measures into force more quickly than previously. Adoption of equipment standards removed practical and legal barriers to effective detection and enforcement, and violations have been almost nonexistent. The institution's success in the past decade depended on taking advantage of exogenous increases in concern to enhance the contractual environment and remove constraints on capacity that had previously impeded effective mitigation of the intentional oil pollution problem.

What lessons for environmental institutions can we draw from this examination of the lengthy history of oil pollution control efforts? I see the lessons as twofold. The first lesson is not especially encouraging. The story laid out here suggests that significant progress in environmental improvement depends on development of strong public concern that in many cases may be outside the control of international policymakers, negotiators, and others concerned about the health of the global environment. Early on, so few governments considered oil pollution a problem that international agreements went unsigned. While some states sought international action, others simply saw no benefits from such action. After 1954, enough governments saw oil pollution as a problem that international action became desirable, but only as long as it involved no significant costs. It took until the 1970s before governments began to impose the high costs—on industry, notably, not on themselves—necessary to reduce intentional oil discharges. Major progress to reduce intentional oil discharges has required environmental crises or shocks sufficient to prompt widespread public concern. NGO action without such broad concern within and across countries proved insufficient to produce effective regulations. Even once support for action developed, it took a combination of three factors—unilateral action by powerful states, a lowering of political resistance among many (though not all) developed states, and a willingness on the part of developing states to support such action—to bring the issue to the international agenda in a way which produced effective regulations.

The second lesson seems more hopeful, however. Once sufficient concern has developed, the right international rules can improve the

environment. Their effectiveness will certainly be constrained by the breadth of support and commitment to achieving real environmental progress. However, the oil pollution story suggests that sometimes even quite strict and expensive rules can induce levels of compliance that promise, over time, to significantly reduce environmental degradation. The very nature of oil pollution has meant that reductions in oil wastes will often be due to self-interested behavior on the part of oil transportation interests. However, oil and shipping interests have adopted technologies to decrease intentional discharges into the ocean even when facing large and direct economic costs. While the lack of progress against oil pollution before the late 1970s must have frustrated many people concerned with the environment, the experience with ineffective rules over that period helped point the way to the rules that were needed to get tankers to stop discharging their oil at sea. Policymakers seeking to mitigate environmental pollution could benefit by developing rules that remove the barriers to states with the capacity and incentives to enforce international agreements, so that during periods when support for action develops, they can use those opportunities to put effective environmental regulations into place.