

# “Ecology Tankers”<sup>1</sup> and the Oil Pollution Act of 1990: A History of Efforts to Require Double Hulls on Oil Tankers

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## CONTENTS

Introduction .....	98
I. Background .....	103
A. The Size and Scope of the Problem .....	103
B. Coast Guard Authority .....	106
II. Double Hulls: Arguments For and Against .....	107
A. Effectiveness .....	107
B. Safety .....	111
1. Explosion and Fire .....	111
2. Stability .....	112
3. Increased Tanker Traffic .....	113
C. Salvage .....	113
D. Cost .....	114
III. Early Efforts to Mandate U.S. Pollution-Preventive Vessel Construction Standards .....	116
A. The Coast Guard Enters the Arena: Regulation of Tank Barges .....	116
B. NEPA Suit and Settlement: <i>EDF v. Peterson</i> .....	120
C. The Trans-Alaska Pipeline: Promise of Marine Safety ..	121
D. Another Coast Guard Proposal: Double Bottoms on Tankers .....	125
IV. International Efforts: IMCO Conferences 1973/1978 .....	126
V. Rejection and Abandonment of Double-Hull Proposals .....	129
A. Aftermath of IMCO: Coast Guard Final Rules .....	130
1. Coast Guard Challenged .....	131

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1. The term was coined by Paul E. Atkinson, former president of Sun Shipbuilding and Drydock Company, a subsidiary of the Sun Oil Company. 135 CONG. REC. E1794 (1989).

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2. The Substance of the Final Rules.....	132
B. Supreme Court Rejection of Stricter State Vessel Construction Standards .....	133
C. Failure and Silence: Late 1970's Through 1980's.....	134
VI. The Oil Pollution Act of 1990: Resurgence of Activity	
Following the <i>Exxon Valdez</i> Disaster .....	136
A. Legislative History of OPA 1990 .....	136
B. The Resulting Legislation.....	138
C. In the Wake of the OPA .....	142
Conclusions .....	143

*As long as there are ships at sea, there will be accidents. We cannot alter that fact. What we can strive to do, what our goal should be, is to insure that these accidents are as infrequent as possible, and that their consequences, to the ship, the personnel onboard, and to the environment, are as harmless as possible.<sup>2</sup>*

*Adm. J.W. Kime, Coast Guard Commandant*

*In study after study double bottoms and double hulls for oil tankers have been cited as a major factor necessary to improve the safety of the world's oil fleet. Time and again this remedy has been proposed in different Administrations by different agencies of the Federal Government, and time and again some of those in the industry have dodged this potential bullet by lobbying against these proposals with an intensity and a vigor that are remarkable.<sup>3</sup>*

*U.S. Representative Robert Torricelli*

## INTRODUCTION

On March 24, 1989, the *Exxon Valdez* struck Bligh Reef in Prince William Sound near Valdez, Alaska. One study estimates the rocks of Bligh Reef penetrated five feet inside the ship's hull.<sup>4</sup> All center and starboard side cargo tanks, with the notable exception of a double-bottomed slop tank, were ruptured.<sup>5</sup> In all, eight of the ship's thirteen cargo

2. *Hearing Before the Subcomm. on Coast Guard and Navigation of the House Comm. on Merchant Marine and Fisheries*, 101st Cong., 2d Sess. 106 (1990) (statement of Adm. J.W. Kime, Commandant, U.S. Coast Guard).

3. *Hearing Before the Subcomm. on Transportation, Aviation and Materials of the House Comm. on Science, Space, and Technology*, 101st Cong., 2d Sess. 1 (1990) (remarks of Rep. Robert Torricelli, Chairman).

4. RICHARD TOWNSEND & BURR HENEMAN, CENTER FOR MARINE CONSERVATION, *THE Exxon Valdez Oil Spill: A Management Analysis* 211 (1989).

5. NATIONAL TRANSPORTATION SAFETY BOARD, NTSB/MAR-90/04, *MARINE ACCIDENT REPORT: GROUNDING OF THE U.S. TANKSHIP EXXON VALDEZ ON BLIGH REEF, PRINCE WILLIAM SOUND NEAR VALDEZ, ALASKA, MARCH 24, 1989*, at 164 (1990) [hereinafter NTSB REPORT].

tanks were damaged.<sup>6</sup> Divers surveying the *Valdez* wreckage hours after the accident described the damaged hull of the ship as "like a tin can with holes punched in it. Big chunks of metal were hanging down. There were dozens of holes, some large enough to drive a truck through."<sup>7</sup> Eventually, the tanker spilled approximately 11 million gallons of Prudhoe Bay crude oil into the pristine waters of Prince William Sound.<sup>8</sup> Despite the enormity of the spill, the oil lost represented only about twenty percent of the total cargo carried by the tanker that night.<sup>9</sup>

The devastating effects of the spill and the various deficiencies in preparedness and leadership which impeded the rapid and successful cleanup of the spill have been well reported in the media and elsewhere.<sup>10</sup> One question, tantalizingly simple, remains to be answered: what happened? The painfully simple answer is that "[a] ship hit a rock"—and broke.<sup>11</sup>

Although the underlying causes of marine accidents (for example, poor training, lack of navigational aids, pilot error) are varied and complex, ships have been hitting rocks, and each other, since people began using water for transportation. Moreover, most agree that despite adoption of a wide range of proposed measures to prevent such incidents, ships will continue running aground or colliding with each other. "Even with improvements in crew training, tank vessel operation, and navigation, accidents will occur."<sup>12</sup>

Finally, it is becoming increasingly clear that despite the promises and reassurances of government and industry,<sup>13</sup> we are simply unable to fully clean up a large oil spill like that of the *Valdez*. We just do not have the technology yet.<sup>14</sup>

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6. *Id.*

7. See, e.g., ART DAVIDSON, IN THE WAKE OF THE *EXXON VALDEZ*: THE DEVASTATING IMPACT OF THE ALASKA OIL SPILL 38 (1990).

8. E.g., TOWNSEND & HENEMAN, *supra* note 4, at 1 n.3 (citing Alaska Dep't of Conservation estimate).

9. See, e.g., *id.* at 1.

10. See generally ALASKA OIL SPILL COMMISSION, SPILL: THE WRECK OF THE *EXXON VALDEZ* (1990) (detailing the history of contingency planning efforts by both government and industry since the time of the pipeline's authorization and discussing the tragic inadequacies of those plans as vividly demonstrated by the events surrounding the *Valdez* spill); DAVIDSON, *supra* note 7 (describing the initial response to the spill, the failures of the cleanup, and the long-term effects on the surrounding ecosystem).

11. DAVIDSON, *supra* note 7, at xi (quoting an unnamed oil company executive).

12. COMMITTEE ON TANK VESSEL DESIGN, NATIONAL RESEARCH COUNCIL, TANKER SPILLS: PREVENTION BY DESIGN 77 (1991) [hereinafter NRC STUDY].

13. See, e.g., ALYESKA PIPELINE SERVICE COMPANY, OIL SPILL CONTINGENCY PLAN 1-1 to 1-7 (1987) (covering both general provisions and those related to Prince William Sound).

14. New technologies are being developed, but are still experimental. See, e.g., *New System for Cleaning up Oil Spills*, S.F. CHRON., Apr. 9, 1992, at A12.

Since accidents cannot be prevented altogether and, as a factual matter, the oil cannot be completely removed once in the water, the issue squarely presented to policymakers is how oil outflow can be minimized and the corresponding environmental damage lessened. One apparently simple, common-sense solution has been debated since the early 1970's (following another infamous tanker accident, the *Torrey Canyon* spill): the addition of a second hull to encompass and protect the existing hull and cargo tanks.

The technology required to build tankers with double hulls (or related designs such as double bottoms and/or sides<sup>15</sup>) is neither new nor especially complex.<sup>16</sup> But, despite essentially uncontradicted evidence that double hulls would prevent or at least reduce the severity of some oil spills following grounding or collision,<sup>17</sup> the Coast Guard, encouraged by tanker industry representatives, has steadfastly refused to institute this requirement.

All three branches of government in the United States, as well as an international maritime organization, have considered and rejected these designs over the past two decades. Following the *Exxon Valdez* spill, lawmakers attempted to address both aspects of the problem—prevention of accidents and prevention of the resulting pollution—in a single, lengthy statute, The Oil Pollution Act of 1990 (OPA).<sup>18</sup> One provision of the new legislation requires double hull ships (or their equivalent) to be phased in over a period of twenty-five years.<sup>19</sup>

This comment examines the controversy over the claimed risks and benefits of various alternative designs, the history of efforts to require double hulls on oil tankers, and, finally, what took so long. The story is one of enormous industry pressure and agency inaction, of missed legal and legislative opportunities, of calculated business and environmental risks, and of predictable pollution. Ultimately, it is a story of a system which seems to require a disaster to force change.<sup>20</sup>

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15. A double hull is a second complete hull enclosing the original hull and cargo tanks. A double bottom design provides added bottom protection, but leaves the sides of the vessel single-skinned. The ship is therefore better able to withstand grounding accidents, but remains vulnerable to collisions. A double sided vessel has a single skin hull but extra protection at the sides which can help protect against collision, but not grounding damage. See *infra* fig. 1.

16. Double bottom construction originated in the late 19th century. OFFICE OF TECHNOLOGY ASSESSMENT, U.S. CONGRESS, OIL TRANSPORTATION BY TANKERS: AN ANALYSIS OF MARINE POLLUTION AND SAFETY MEASURES 39 (1975) [hereinafter OTA STUDY].

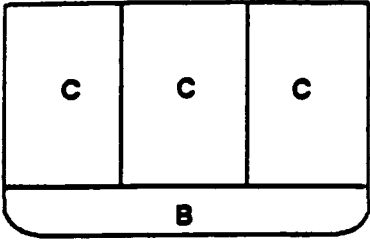
17. See *id.* at 44-45; NRC STUDY, *supra* note 12, at 115-17. Groundings are more common in U.S. waters than in the rest of the world, where there is no single dominant cause of pollution. See *infra* figs. 2-3.

18. Oil Pollution Act of 1990, Pub. L. No. 101-380, 104 Stat. 484.

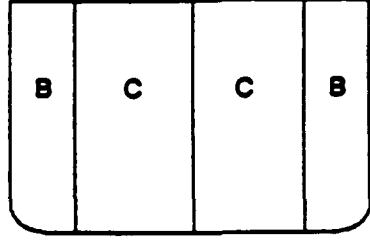
19. *Id.* § 4115 (codified at 46 U.S.C.A. § 3703a (West Supp. 1991)).

20. Others have taken this argument even further, maintaining that the system itself is "error-inducing." That is, the equipment, personnel, and culture of marine transportation are set up to encourage rather than prevent accidents. See, e.g., CHARLES PERROW, NORMAL ACCIDENTS: LIVING WITH HIGH-RISK TECHNOLOGIES 172-77 (1984).

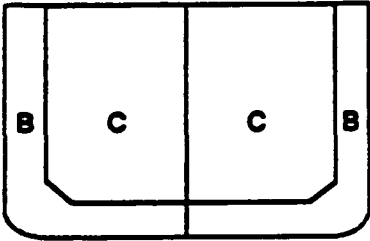
C = Cargo  
B = Ballast



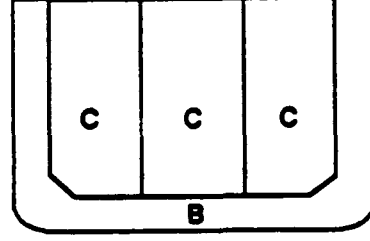
a. Double Bottom



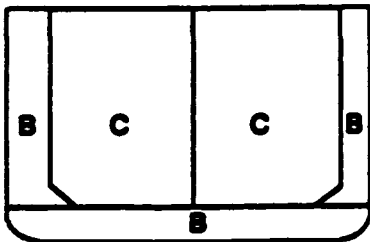
b. Double Sides



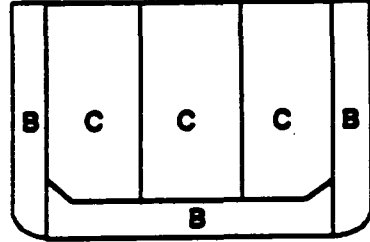
c. Double Hull  
"L" Arrangement



d. Double Hull  
"U" Arrangement



e. Double Bottom  
Double Side



f. Double Side  
Double Bottom

FIGURE 1  
BALLAST TANK ARRANGEMENTS<sup>21</sup>

21. Source: NRC STUDY, *supra* note 12, at 87, fig. 4-2.

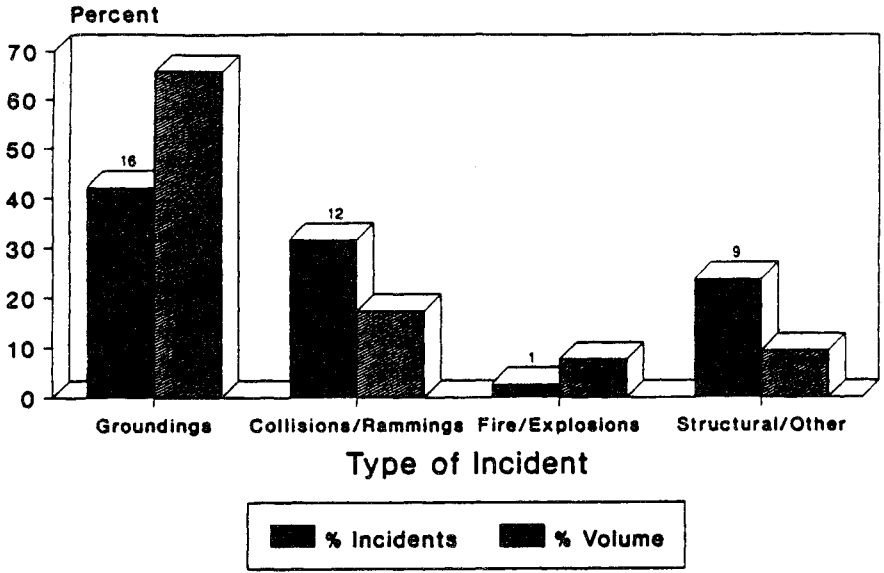


FIGURE 2  
CAUSES OF MAJOR TANKER OIL SPILLS: U.S.<sup>22</sup>

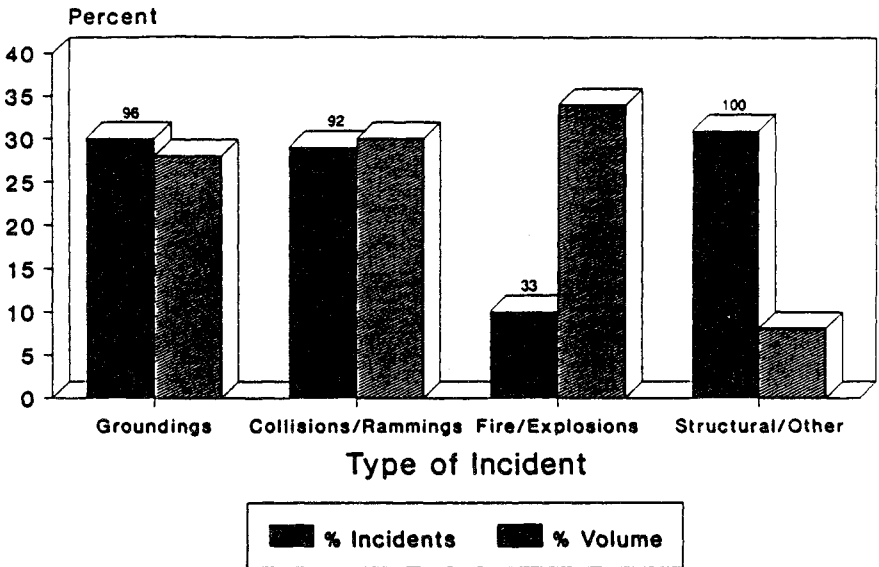


FIGURE 3  
CAUSES OF MAJOR TANKER OIL SPILLS: WORLD<sup>23</sup>

22. Source: NRC STUDY, *supra* note 12, at 30, fig. 1-11.  
23. Source: *Id.* at 27, fig. 1-10.

I  
BACKGROUND

*A. The Size and Scope of the Problem*

Each year, approximately 114,000 tons of oil are accidentally<sup>24</sup> released into the marine environment, about twenty percent of the total annual spillage.<sup>25</sup> To compare, 97 million tons of crude oil were shipped from the Valdez terminal in 1988.<sup>26</sup> In March 1989, the *Exxon Valdez* spilled 35,600 tons.<sup>27</sup> Further, while the effects of a major accident are devastating, as seen from the *Valdez* spill, the vast majority of all casualties<sup>28</sup> cause no pollution at all.<sup>29</sup> The Coast Guard has estimated that about nine percent of casualties result in pollution.<sup>30</sup>

TABLE 1  
PETROLEUM HYDROCARBONS RELEASED INTO THE MARINE  
ENVIRONMENT 1985 ESTIMATES<sup>31</sup>

Source (Million Tons/Year)	"Best Estimate"
Natural Sources	0.25
Offshore Production	0.05
Maritime Transportation	1.50
Tanker Operation	0.70
Tanker Accidents	0.40
Other	0.40
Atmospheric Pollution Carried to the Sea	0.30
Municipal and Industrial Wastes and Runoff	<u>1.18</u>
<b>Total</b>	<b>3.3</b>

24. Accidental releases include spills from groundings, collisions, loading and unloading operations, explosions, and other mechanical failures. See NRC STUDY, *supra* note 12, at 10, 27-28 n.18. Intentional discharges have always amounted to a greater total amount of oil pollution compared to accidents. See *infra* tbls. 1-2; BOARD ON OCEAN SCIENCE AND POLICY, NATIONAL RESEARCH COUNCIL, OIL IN THE SEA: INPUTS, FATES AND EFFECTS 56-65 (1985) (making a "best estimate" that two-thirds of oil pollution results from operational discharges, one-quarter from accidents, and the rest from drydocking and terminals). They are mostly the result of discharging oily ballast into the ocean. Daniel Bodansky, *Protecting the Marine Environment from Vessel Source Pollution: UNCLOS III and Beyond*, 18 ECOLOGY L.Q. 719, 724 (1991). This practice, and the international solution, are discussed *infra* part IV.

25. See *infra* tbls. 1-2; NRC STUDY, *supra* note 12, at 10-11.

26. NRC STUDY, *supra* note 12, at 11.

27. *Id.* at vii.

28. "Casualty" denotes a variety of accidents causing damage to a tanker, including groundings, collisions, fires, explosions, and mechanical and structural failures. See *id.* at 27-28 n.18.

29. *Id.* at 13 (citing LLOYD'S REGISTER OF SHIPPING, STATISTICAL STUDY OF OIL OUTFLOW FROM OIL AND CHEMICAL TANKER CASUALTIES (1990)).

30. *Id.* at 8 (citing U.S. COAST GUARD, ASSESSMENT OF SUCCESS OF TANKSHIPS WITH DOUBLE BOTTOMS AND PL/SBT IN MITIGATING POLLUTION DUE TO CASUALTIES (1990) (internal analysis)).

31. Source: *Id.* at 12, tbl. 1-1.

TABLE 2  
OIL RELEASED INTO THE MARINE ENVIRONMENT<sup>32</sup>

Source (Million Tons/Year)	1990 U.S. Coast Guard	1985 NRC (1981 Data)	1975 NRC
Bilge and Fuel Oil	0.25	0.31	} 1.08
Tanker Operational Losses Accidental Spillage	0.16	0.71	
Tanker Accidents	0.11	0.41	0.20
Non-Tanker Accidents	0.01	—	0.10
Marine Terminal Operations	0.03	0.04	0.50
Drydocking	} 0.01	0.03	0.25
Scrapping of Ships			
Total	0.57	1.50	2.13

Before considering the efficacy and overall impact of U.S. legislation on marine pollution worldwide, it is important to note the relatively small size of the U.S.-flag fleet of tankers: only eight percent of the world's operating fleet.<sup>33</sup> In the Alaska trade, however, ninety-six percent of the tankers are U.S.-flag ships.<sup>34</sup> The vast majority of all tankers, about seventy-nine percent worldwide, are single-skinned.<sup>35</sup> Although several Alaska-trade tankers are equipped with double bottoms, most, including the *Exxon Valdez*, are not.<sup>36</sup> Less than one of every six U.S.-flag tankers has some double-skin design.<sup>37</sup>

Over the years, ships have been getting larger and larger, but not necessarily safer. Strangely, in the shipping industry, many technological innovations have had the perverse effect of decreasing safety margins.<sup>38</sup> The primary architectural goal is to get maximum deadweight for the minimum draft.<sup>39</sup> "Prevention of damage or rupture of structure due to collisions or groundings heretofore has *not* been a design consideration for merchant ships . . . ."<sup>40</sup>

32. Source: *Id.* at 12, tbl. 1-2.

33. *Id.* at 16.

34. *Id.*

35. *Id.* at 8 (citing TANKER ADVISORY CENTER, GUIDE FOR THE SELECTION OF TANKERS (1990)).

36. *Id.*

37. *Id.* Worldwide, 79% of tankers of 10,000 tons or more are single-skinned. *Id.*

38. See generally PERROW, *supra* note 20, at 203-08 (detailing failures of radar, collision avoidance systems, and other technological devices).

39. NRC STUDY, *supra* note 12, at 30. Deadweight is the weight capacity of cargo, consumable liquids (e.g., oil and water), stores, and the crew and their effects, excluding the weight of the ship. *Id.* at 2 n.1. Draft is the depth of water the vessel draws. *Id.* at 30.

40. *Id.* at 33.



Over the last several decades, as more sophisticated computers have been developed for use in ship design, modern tankers have become, in the National Research Council Committee's words, "less robust" than their predecessors.<sup>41</sup> Computers have enabled naval architects to produce more efficient designs since calculations can be accomplished more precisely. Thus, architects now can, and often do, reduce the traditional "safety factors" or design margins that were previously included in vessel designs to compensate for errors in calculations and for flaws in construction materials and fabrication.<sup>42</sup>

At the same time design margins were shrinking, tanker size was increasing dramatically. Between 1950 and 1975, the largest tanker in the world grew from 25,000 deadweight tons (DWT) to over 500,000 DWT, a twentyfold increase.<sup>43</sup> "The biggest, as of 1974, was the *Globtik Tokyo*, with a deadweight . . . of 476,292 tons, . . . a length of 1,243 feet (four football fields, or nearly one-quarter of a mile), and a draft . . . of 92 feet (about the height of an eight-story office building)."<sup>44</sup> The cargo spaces within the ship became fewer and larger. While this reduced the construction costs of large tankers still further, it also increased the risk of greater pollution in the event of an accident.<sup>45</sup>

Compounding these problems, competitive pressures in the 1980's pushed shipping companies to demand even cheaper, lighter ships. Ship designers responded, using more high-tensile steel for the hull structure. This material allowed shipbuilders to produce lighter, and thus more cost efficient, vessels.<sup>46</sup> The problem is that thinner structural steel is more vulnerable to corrosion. While all steel corrodes at the same rate if unprotected, thinner steel provides a smaller margin of protection when corrosion occurs. In the 1950's and 1960's, large tankers commonly had bottom plate thicknesses of thirty to thirty-five millimeters. Today, these plates are only about twenty millimeters thick.<sup>47</sup> As a result of all of these factors, the "modern hull structure is relatively less able to resist unexpected loads such as from grounding or collision."<sup>48</sup>

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41. *Id.* at 79.

42. *Id.* at 78-79.

43. *Id.* at 30. Vessels over 200,000 DWT, such as modern tankers, are called VLCC's (very large crude carriers). *Id.* at 337.

44. PERROW, *supra* note 20, at 196.

45. NRC STUDY, *supra* note 12, at 30-32. In fact, over the years many have suggested that another simple, low-tech way to reduce oil outflow in the event of an accident would be to make cargo tanks smaller. *Id.* at 143.

46. *Id.* at 79.

47. *Id.* at 79-80. Rulemaking to establish minimum plating thickness standards for tankers and may solve this problem.

48. *Id.* at 79.

### B. Coast Guard Authority

Authority to regulate tankship construction and operation was vested in the Department of Transportation and through it, the Coast Guard, by the Ports and Waterways Safety Act of 1972 (the PWSA).<sup>49</sup> The PWSA consisted<sup>50</sup> of title I,<sup>51</sup> which governed vessel operations such as traffic control systems, and title II,<sup>52</sup> which directed the Coast Guard to promulgate regulations establishing design, construction, and maintenance standards for tank vessels. Under the statute:

[T]he Secretary of the department in which the Coast Guard is operating . . . shall establish for the vessels to which this section applies such additional rules and regulations as may be necessary with respect to the design and construction, alteration, repair, and maintenance of such vessels, including, but not limited to, the superstructures [and] hulls . . . and with respect to . . . the prevention and mitigation of damage to the marine environment.<sup>53</sup>

In promulgating the rules and regulations, Congress directed the Coast Guard to consider design and construction standards with which to "reduce the possibility of collision, grounding, or other accident, to reduce cargo loss following collision, grounding, or other accident, and to reduce damage to the marine environment by normal vessel operations such as ballasting . . ." <sup>54</sup> The regulations called for under this legislation were required to be promulgated no earlier than January 1, 1974, "unless the Secretary shall earlier establish rules and regulations consonant with international treaty, convention, or agreement," but not later than January 1, 1976 in the absence of such international accord.<sup>55</sup> Later, Revised Statute subsection (7)(C) was amended to require that the rules and regulations required under subsection (7)(A) be in place for U.S.-flag vessels engaged in domestic trade by June 30, 1974.<sup>56</sup>

49. Pub. L. No. 92-340, 86 Stat. 424 (codified as amended at 33 U.S.C.A. §§ 1221-1236 (West 1986 & Supp. 1991)).

50. The PWSA was amended several times. Port and Tanker Safety Act of 1978, Pub. L. No. 95-474, 92 Stat. 1471; Pub. L. No. 98-557, 98 Stat. 2875 (1984); Pub. L. No. 99-399, 100 Stat. 890 (1986); Pub. L. No. 101-380, 104 Stat. 514 (1990); and Pub. L. No. 101-589, 104 Stat. 3040 (1990); *see also infra* notes 267-73 and accompanying text for a discussion of the enactment of the Port and Tanker Safety Act of 1978. Vessel construction standards are now found at 46 U.S.C. § 3703a (West Supp. 1991).

51. Pub. L. No. 92-340, §§ 101-107, 86 Stat. 424, 424-27 (1972) (codified as amended at 33 U.S.C.A. §§ 1221-1227 (West 1986 & Supp. 1991)).

52. *Id.* §§ 201-203, 86 Stat. at 427-32 (1972). PWSA § 201 (formerly codified at 46 U.S.C. § 391a (Supp. V 1970) (Rev. Stat. § 4417a)) was officially repealed by the Partial Revision of Title 46, United States Code, Shipping, Pub. L. No. 98-84, § 4(b), 97 Stat. 500, 599-600, 605 (1983), but its provisions were revised and consolidated and have been codified as amended in scattered sections of 46 U.S.C.A. (West Supp. 1991).

53. Pub. L. No. 92-340, § 201, 86 Stat. 424, 428 (1972) (Rev. Stat. § 4417a(3)).

54. *Id.*, 86 Stat. at 430 (Rev. Stat. § 4417a(7)(A)).

55. *Id.* (Rev. Stat. § 4417a(7)(C)).

56. Pub. L. No. 93-153, § 7, 87 Stat. 546, 589 (1973).

Over the years, in accordance with the commands of the PWSA, the Coast Guard has made a number of attempts to enact minimum vessel construction and design standards for oil tankers to help prevent both intentional and accidental marine pollution.<sup>57</sup> As will be discussed further below, these efforts largely failed. The opponents of double-hull, -bottom, or -side requirements powerfully and persistently argued that these alternative designs would cause serious safety risks and that exorbitant implementation costs would be disastrous for U.S. shipping and oil interests.

Following the *Exxon Valdez* spill, Congress did what the Coast Guard had failed to do: it mandated double hulls on most newly constructed oil tankers. After looking at the arguments surrounding various alternative designs, we will examine a series of Coast Guard regulatory proposals and other efforts to mandate adoption of these alternative designs.

## II

### DOUBLE HULLS: ARGUMENTS FOR AND AGAINST

Over the years, a number of arguments have been advanced on both sides of the double-hull controversy. Before examining the history of efforts to mandate stricter construction standards, including double hulls, it is necessary to understand the substance of the debate. There are four basic areas of concern over double hulls on oil tankers: effectiveness, safety, salvage difficulties, and cost.

#### A. Effectiveness

Every report of which the author is aware has concluded that double hulls and bottoms are effective in preventing accidental spills or lessening their severity.<sup>58</sup> In single-skin vessels, the cargo tanks are located just inside the outer hull (with the ocean on the other side). Any accidental breaching of the hull will result in oil outflow (unless the breached tank happens to be empty or carrying water as ballast on a return trip). Double hulls provide an added layer of protection. "Almost without exception, if a ship has a double bottom, you don't have a spill, and if it doesn't have a double bottom, you do. It doesn't take Dick Tracy to figure that out."<sup>59</sup>

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57. See *infra* parts III.A, III.D. In addition to proposals for double bottoms, sides, and hulls, segregated ballast regulations and a number of other technical changes in design and production could help prevent marine pollution.

58. See, e.g., James C. Card, *Effectiveness of Double Bottoms in Preventing Oil Outflow from Tanker Bottom Damage Incidents*, 12 MARINE TECH. 60 (1975); NRC STUDY, *supra* note 12; OTA STUDY, *supra* note 16.

59. Eric Nalder, *Tankers Full of Trouble—Bottom Line: Safety Runs Skin Deep*, SEATTLE TIMES, Nov. 14, 1989 (quoting Seattle Coast Guard Investigator Lt. Cmdr. Larry Lockwood), reprinted in 135 CONG. REC. E4032 (daily ed. Nov. 21, 1989).

Studies have concluded that many oil spills, including the one by the *Exxon Valdez*, could have been prevented by or their severity lessened by some type of double-skin construction.<sup>60</sup> In one early study, thirty tank vessel casualties occurring between January 1969 and April 1973 were examined to determine whether double bottoms would have prevented the resulting oil outflow.<sup>61</sup> Based upon a projected height between the double bottom and the inner hull of one-fifteenth of the tanker beam height (B/15),<sup>62</sup> in twenty-seven of the thirty cases, a double bottom would have reduced oil outflow.<sup>63</sup> This means that in the cases studied (mostly small to medium sized tankers, not VLCC's<sup>64</sup>), a double bottom of B/15 would have been effective in ninety percent of the incidents "in reducing oil outflow from the recent bottom damaging incidents in U.S. waters."<sup>65</sup> One report following the grounding of the *Valdez* speculated that if that tanker, with a beam of 166 feet, had been fitted with a double bottom or hull (as it was originally designed), the space between the bottom and the cargo tanks would have been eleven feet.<sup>66</sup> As noted above, the rocks of Bligh Reef penetrated an estimated five feet into the *Valdez's* hull.<sup>67</sup>

More recently, the National Research Council found that no pollution occurred in fifty-four groundings of double-bottomed ships between 1977 and 1987.<sup>68</sup> The NRC study concluded that ships with double bottoms or double hulls would spill *no* oil in eighty-five percent of groundings, while single-skinned ships would almost always lose at least some oil.<sup>69</sup> Further, the spillage reduction benefits of double hulls were found to be *greater* in VLCC's than in smaller ships.<sup>70</sup> Overall, after examining a wide variety of alternative designs and combinations, the study found that of the options considered, VLCC's with double hulls would have the smallest potential oil outflow.<sup>71</sup>

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60. See, e.g., NTSB REPORT, *supra* note 5, at 164.

61. Card, *supra* note 58, at 61.

62. This is the most commonly used dimension suggested for double bottoms or double hulls. NRC STUDY, *supra* note 12, at 84-85. This measure should prevail for all but the largest ships, in which case B/15 would not be possible or advisable. Thus, B/15 to a *maximum* height of 3 meters is usually accepted. See *id.* at 85.

63. Card, *supra* note 58, at 62.

64. See *supra* note 43.

65. *Id.*

66. TOWNSEND & HENEMAN, *supra* note 4, at 8.

67. *Id.* at 211.

68. NRC STUDY, *supra* note 12, at 8.

69. *Id.* at 147.

70. *Id.* at 152.

71. *Id.* at 145; see also *infra* tbl. 3.

TABLE 3  
OIL OUTFLOW WITH ALTERNATIVE DESIGNS FOR VLCC'S<sup>72</sup>

Design Alternative for 240,000 DWT Tanker	Oil Outflow Relative to MARPOL * (100%) for Composite of Collisions (40%) and Groundings (60%)	
	Low Energy (5 knots)	High Energy (10 knots)
Double Bottom (B/15)	42	37
Double Sides	88	130
Double Hull	33	26
Hydrostatic Control (passive)	62	40
Smaller Tanks (1/2 MARPOL)	58	70
Intermediate Oil-Tight Deck with Double Sides	32 **	23 **
Double Sides with Hydrostatic Control (passive)	32 **	21 **
Double Hull with Hydrostatic Control (passive)	30 **	22 **

\* MARPOL standard tankers have protectively located segregated ballast tanks.

\*\* Committee Estimate (see Appendix K).

Even where both the protective outer hull and the inner hull and cargo tanks are ruptured in a high-energy grounding, employment of a double bottom or double hull is apt to be beneficial. First, the damage to the inner hull, if it occurs, is likely to be less severe, since the outer hull will absorb a great deal of the initial impact.<sup>73</sup> Second, the outer hull continues to serve to contain the pollution somewhat, providing precious time in which lightering<sup>74</sup> and salvage operations can be instituted and the spill can be contained.<sup>75</sup>

Various studies have ascribed numerous incidental benefits to double bottoms and hulls. First, since the cargo tanks are separate from the outer hull, they have smooth interior surfaces which reduce the amount of oil remaining on the sides, resulting in more efficient cargo

72. Source: NRC STUDY, *supra* note 12, at 152, tbl. 5-5.

73. NTSB REPORT, *supra* note 5, at 164.

74. "Lighter" refers to the transfer of one (usually larger) vessel's oil cargo onto a smaller tanker while at sea. Usually the operation is performed in order to lighten the larger vessel, allowing it to enter port and discharge its remaining oil cargo. NRC STUDY, *supra* note 12, at 35.

75. OTA STUDY, *supra* note 16, at 45.

unloading operations and easier cleaning.<sup>76</sup> Second, the void spaces can be used to carry clean ballast on return trips instead of dedicating segregated ballast cargo tanks<sup>77</sup> for this purpose, as required under the international protocols.<sup>78</sup> Last, salvage operations may be made easier by the presence of a double bottom or double hull following an accident.<sup>79</sup>

One objection in this category is sometimes, though rarely, made: that double hulls actually *increase* the outflow of oil in an accident.<sup>80</sup> "This is refuted by physics," according to the National Research Council (NRC) study; hydrostatic pressure will cause outflow to be the same or less in a double hull as compared to a single-skin tanker.<sup>81</sup>

A final, powerful argument in favor of double hulls is provided by the example of hazardous chemical and liquified natural gas tankers. For years, these vessels have been required, by both domestic and international rules, to be built with double hulls or bottoms.<sup>82</sup> The purpose of those designs is to prevent spillage of hazardous cargo in the event of an accident.<sup>83</sup> Why are these construction standards accepted by industry and policymakers alike for certain types of tankers but not for oil tankers? One explanation, having nothing to do with safety, effectiveness, or any of the other arguments discussed herein, was given by Retired Coast Guard Rear Admiral William Benkert. While acknowledging that oil tankers present a pollution risk, Admiral Benkert pointed out that, "Chemicals are harmful to human beings. We have not seen fit to approach crude oil, or other types of petroleum products in the same vein because the risk isn't there for people."<sup>84</sup>

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76. *Id.* at 46; NTSB REPORT, *supra* note 5, at 164.

77. After a tanker unloads its cargo of oil, it must take on water in order to maintain vessel stability on the return trip. This was traditionally done by filling the now-empty (but still oil-coated) cargo tanks with seawater. Later, the oily water mixture was discharged into the ocean when preparing to reload. *See* NRC STUDY, *supra* note 12, at 35.

"Segregated ballast" refers to separate noncargo tanks (segregated ballast tanks or SBT's) dedicated to carrying the required ballast, replacing the use of emptied oil tanks. *Id.* at 83, 337. Thus, the ballast water remains clean, untainted by any cargo oil remaining in the tanks.

78. *See infra* part IV for discussion of international protocols.

79. *See infra* part II.C.

80. E. Scott Dillon, *Ship Design Aspects of Oil Pollution Abatement*, 8 MARINE TECH. 293, 323 (1971) (comments of W.O. Gray, Esso International, Inc.). Gray asserts that the "greater static head of oil above the waterline when loaded" will lead to an amount of oil outflow "two to three times that occurring with a conventional freeboard draft tanker." *Id.* Gray also argues that "unless the height of the double bottom is equivalent to or greater than the increase in ship depth, outflow with bottom and tank top damage will be greater than for the conventional tanker." *Id.*

81. NRC STUDY, *supra* note 12, at 92.

82. NTSB REPORT, *supra* note 5, at 165; OTA STUDY, *supra* note 16, at 39.

83. OTA STUDY, *supra* note 16, at 39.

84. Nalder, *supra* note 59, at E4032. Admiral Benkert headed the U.S. delegation to an international conference in 1978 that failed to adopt the U.S. proposal for a double-bottom requirement on oil tankers. *See infra* part IV.

## B. Safety

One widespread objection to requiring double bottoms or double hulls on oil tankers has to do with safety. The risk of explosion is said to be greater than in conventional ships, stability following an accident may be compromised, and the frequency of accidents will, according to some, increase due to the expansion in tanker traffic necessary to carry the same amount of oil. Each of these arguments will be examined in turn.

### 1. Explosion and Fire

The risk of explosion is one of the most common and most serious of the objections raised. It is also perhaps the best argument against double bottoms, sides, and hulls. The potential problem arises due to leakage of cargo or hydrocarbon vapors into the void areas created in the double bottom, sides or hull of the tanker.<sup>85</sup> The leakage could result from a number of causes; corrosion of the cargo tanks adjoining the void space is especially problematic. Any one of a number of sources could ignite the vapors, causing an explosion which could potentially result in oil outflow, loss of life, and even loss of the ship itself. While "this hazard cannot be taken lightly,"<sup>86</sup> several points can be made in this regard.

First, many specific areas of tankers subject vessels to this same risk, and precautions have been taken to reduce its magnitude. For instance, both pump rooms and segregated ballast tanks present an explosion risk.<sup>87</sup> Inert gas systems are often used to displace the oxygen from these spaces, thereby reducing the threat of explosion.<sup>88</sup> Such inerting systems can also be applied to the increased void spaces created by double hulls, sides, or bottoms. Common sense measures can be employed as well, such as proscribing possible ignition sources from coming into contact with these areas.<sup>89</sup>

The problem with hull corrosion (which could potentially allow leakage) occurs because the alternative designs increase the amount of void spaces in a ship, leaving more surface space to corrode.<sup>90</sup> The metal inside the void spaces is left fully exposed, since it lacks the thick layer of crude oil which coats and protects the interior of cargo tanks against

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85. Some point to the chemical tanker *Puerto Rican* which exploded off the San Francisco coast in 1984 as an example of this problem. The explosion was suspected to have occurred in the void space of the double bottom. See NATIONAL TRANSPORTATION SAFETY BOARD, NTSB/MAR-86/05, MARINE ACCIDENT REPORT: EXPLOSION AND FIRE ON BOARD U.S. CHEMICAL TANKSHIP *Puerto Rican* in the Pacific Ocean Near San Francisco, California, October 31, 1984, at 1 (1986).

86. Dillon, *supra* note 80, at 303.

87. NRC STUDY, *supra* note 12, at 69, 97-98.

88. See Dillon, *supra* note 80, at 303; NTSB REPORT, *supra* note 5, at 164.

89. OTA STUDY, *supra* note 16, at 47.

90. See NRC STUDY, *supra* note 12, at 98.

corrosion.<sup>91</sup> If protective measures such as anodic protection and proper maintenance are not taken, rapid corrosion can occur.<sup>92</sup> Again, similar problems exist with respect to segregated ballast tanks.<sup>93</sup> Solutions employed there can and should be applied to the void spaces created by double bottoms, sides, and hulls.

Proper design, inspection, crew training, and maintenance would help solve all of these problems.<sup>94</sup> However, it is important to note that serious problems already exist as to proper crew training and adequate maintenance and inspection. The NRC study itself found existing Coast Guard inspections "barely adequate" and found current efforts "not sufficient to ensure structural safety of oil tankers."<sup>95</sup>

Finally, although the NRC study found insufficient evidence to determine the issue conclusively, it noted that it had found no increase in "personnel casualties or fires/explosions" with existing double-bottomed, -hulled, or -sided ships.<sup>96</sup> The Tanker Advisory Center has noted that there have been no fires or explosions in the double bottoms of tank vessels during the past twenty-five years.<sup>97</sup> Thus, while the risk of explosion cannot be ignored, the problem is not insurmountable, and the likelihood of such an accident is not so great as to justify foregoing the benefits associated with the alternative pollution-preventive tanker construction designs.

## 2. *Stability*

Tankers have loading limits which assure that if one or more compartments of the ship are flooded, sufficient reserve buoyancy is maintained so that the ship won't sink<sup>98</sup> and will maintain proper heel<sup>99</sup> and trim<sup>100</sup> levels. When a double-hull vessel is punctured in a grounding, water rushes in, but, unlike a single-skin tanker, oil does not rush out. This is, of course, the sought-after environmental benefit provided by double hulls. The problem is that since oil does not flow out to compensate for the additional weight of the water being taken on, the ship may become destabilized.

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91. *Id.* at 70.

92. *Id.* at 97-98.

93. *Id.* at 70.

94. *Id.* at 98.

95. *Id.* at 48.

96. *Id.* at 98; *see also* OTA STUDY, *supra* note 16, at 47 (concluding that no evidence of increased explosions was found in other classes of ships with double hulls or bottoms, such as chemical carriers and others with bulk flammable cargoes).

97. NTSB REPORT, *supra* note 5, at 164.

98. NRC STUDY, *supra* note 12, at 83.

99. Heel is the extent of tilt to one side.

100. Trim is the difference in forward and aft draft.



The NRC study acknowledges that double-hull tankers can withstand less damage than conventional tankers using current damage stability standards, but states that, from an engineering perspective, all current stability criteria can be met.<sup>101</sup> The suggested solution is to increase damage-stability requirements through proper design rather than to forego the pollution-prevention benefits provided by double sides, bottoms, and hulls.<sup>102</sup>

### 3. Increased Tanker Traffic

Critics charge that the decreased cargo tank space available in tankers fitted with double hulls will require a large increase in the number of tankers operating in U.S. waters in order to maintain current levels of oil transport. The result of this increase in traffic could be a corresponding increase in tanker accidents, especially collisions. The NRC study found, however, that if the void spaces in the bottom and sides of the ship created by a double hull are used as segregated ballast space (rather than dedicating cargo tanks for that purpose), "little or no penalty in cargo carrying capacity" is caused by these designs.<sup>103</sup>

#### C. Salvage

Another common objection to requiring double hulls or bottoms on vessels is that, in the event of an accident, salvage operations will be rendered more difficult. When a single-skin tanker's hull is punctured, oil generally flows out, lightening the ship, which can then potentially ride over the obstruction.<sup>104</sup> When the outer, but not the inner shell of a double-hulled or double-bottomed tanker is breached, water rushes in, making the ship heavier and more firmly grounded since no oil is discharged to lighten the ship. While this effect may occur, many view it as a *positive* rather than a negative result.<sup>105</sup> In fact, the salvage contractor responsible for refloating the *Exxon Valdez* and other single- and double-skinned ships has said, "in most cases a double bottom would make a ship easier to salvage."<sup>106</sup>

Causing the ship to become more firmly grounded produces three primary benefits. First, grounding the ship reduces the risk of further

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101. NRC STUDY, *supra* note 12, at 89.

102. *Id.*

103. *Id.* at 84-85.

104. OTA STUDY, *supra* note 16, at 47-48. However, the NRC study notes that in groundings of tankers traveling at "service speeds," most ships, regardless of whether single- or double-hulled, will remain stranded and not ride over the obstruction. NRC STUDY, *supra* note 12, at 91.

105. NRC STUDY, *supra* note 12, at 93-94. An "informal survey" of professional salvors found they *unanimously* favored double-bottomed ships for salvage operations. *Id.* at 94, 99 n.7.

106. Nalder, *supra* note 59, at E4032 (quoting J.H. "Mick" Leitz).

damage and additional loss of cargo, since the damaged ship is less likely to be tossed by waves or affected by other adverse weather conditions.<sup>107</sup> Second, professional salvors are given more flexibility and may be able to lighter the remaining cargo more quickly since the intact tanks will not contain a mixture of oil and seawater which would slow this process.<sup>108</sup> Finally, the salvors are able to wait until the optimal time to refloat the damaged ship, and at that time can "blow out" the unwanted seawater in flooded double hulls or bottoms much faster and more easily than in cargo tanks.<sup>109</sup>

#### D. Cost

The purportedly enormous economic costs of implementing a double-hull standard have been a recurrent and persuasive argument against mandating alternative vessel construction standards.

The estimated costs associated with either retrofitting existing tankers or the added costs of building new tankers with double hulls or bottoms have varied widely over the years. Indeed, it is "most difficult to reach a rational decision on cost effectiveness of various approaches to accidental" pollution control.<sup>110</sup> According to one early study, shipyards estimated that in the early 1970's, building double bottoms and double hulls would cost between 3% and 5% more, respectively, than building a standard single-skin tanker. The study noted that cost estimates by others (presumably the shipping industry) were consistently overestimated compared to actual contracts for such vessels.<sup>111</sup> Another study estimated the capital cost increase for double bottoms to be between 5% and 11%.<sup>112</sup> The National Transportation Safety Board estimates increased construction costs of 15% to 19% for double-hulled vessels.<sup>113</sup>

There are two problems with evaluating these cost estimates. First, it is unclear in many of the cost estimates whether increased construction costs alone are being quoted, or whether the final number includes expected increases and/or decreases in operating and other costs. Second, many of the relevant variables are difficult to quantify, such as the environmental benefits associated with increased pollution prevention (which in part depends upon resolution of such volatile liability issues as valua-

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107. OTA STUDY, *supra* note 16, at 48; NTSB REPORT, *supra* note 5, at 164.

108. See NRC Study, *supra* note 12, at 93 (explaining that in single-hulled tankers, the offloading of cargo is difficult due to "removal of large amounts of oil floating on top of seawater that has entered through the damaged bottom").

109. *Id.* at 93.

110. Dillon, *supra* note 80, at 303.

111. OTA STUDY, *supra* note 16, at 42.

112. George C. Steinman & Walter B. Chappel, *The MarAd Pollution Abatement Program in Relation to the 1973 IMCO Marine Pollution Convention*, 12 MARINE TECH. 65, 67 (1975).

113. NTSB REPORT, *supra* note 5, at 165.

tion of natural resource damages<sup>114</sup>) and reduced operating costs associated with easier tank cleaning, loading and unloading, and other operations. According to the Townsend & Heneman report, “[t]he operational cost savings associated with double-hulled and double-bottomed tankers may be sufficient to offset the higher capital costs of these tankers. If not, the decreased risk of liability may be sufficient . . . .”<sup>115</sup>

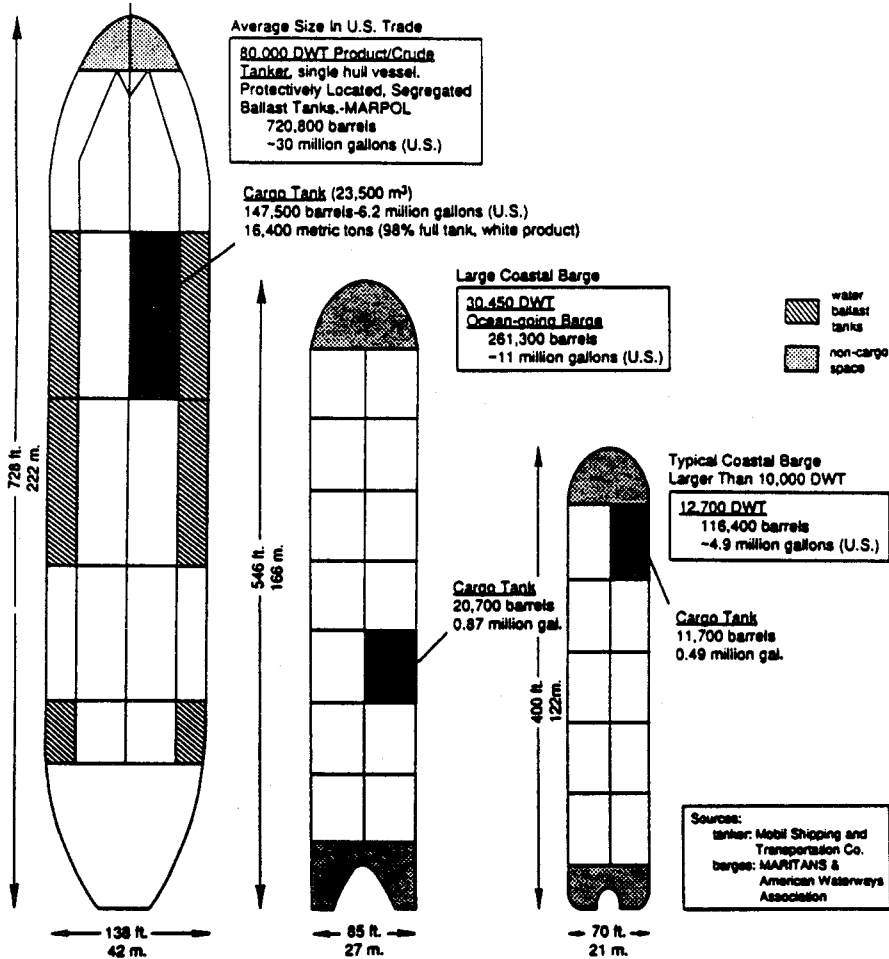


FIGURE 4  
 TANKERS AND BARGES<sup>116</sup>

114. See, e.g., *Ohio v. United States Dep't of Interior*, 880 F.2d 432 (D.C. Cir. 1989) (discussing various valuation measures and rejecting the recently promulgated Interior Department regulations on natural resource damages).

115. TOWNSEND & HENEMAN, *supra* note 4, at 212.

116. Source: NRC STUDY, *supra* note 12, at 21, fig. 1-7.

In addition to increased construction costs (which everyone acknowledges), double bottoms and hulls may increase operating costs, such as maintenance and inspection costs, and may decrease cargo carrying capacity. Other potential impacts which could result from attempts to avoid new unilateral U.S. standards—including lightering outside of U.S. jurisdiction or trends in the oil transportation industry away from U.S. ports and U.S.-flag vessels—might mean additional costs for the tanker industry and U.S. consumers.<sup>117</sup> While the enormous cleanup and liability costs associated with a major oil spill would seem incentive enough to the shipping industry, the probability of incurring such liability is viewed as slight, since accidents simply don't happen that often.

A full exploration and quantification of these various factors is beyond the scope of this paper. Thus, the cost effectiveness of various alternative vessel construction designs must be left to experts. It is enough to conclude, as did the NRC study, that double hulling is an "attractive alternative" to the designs allowed by current standards.<sup>118</sup>

### III

#### EARLY EFFORTS TO MANDATE U.S. POLLUTION-PREVENTIVE VESSEL CONSTRUCTION STANDARDS

Both U.S. and international efforts to address the environmental threats associated with tanker transportation gained momentum in the early 1970's, following the 1967 grounding of the *Torrey Canyon*, "that point in pollution history from which all time is reckoned."<sup>119</sup> By the mid-1970's, those efforts had stalled, and they were abandoned during the late 1970's and through the 1980's. Only after another infamous accident, the grounding of the *Exxon Valdez*, did the public and policy-makers turn their attention to the issue of vessel construction once again.

##### *A. The Coast Guard Enters the Arena: Regulation of Tank Barges*

On December 24, 1971, the Coast Guard published a proposed rulemaking to deal with both intentional and accidental vessel source pollution.<sup>120</sup> The rulemaking was proposed under the authority of the Federal Water Pollution Control Act, which required the President to issue regulations "establishing procedures, methods, and equipment and other requirements for equipment to prevent discharges of oil . . . from vessels . . . ."<sup>121</sup> One Coast Guard proposal dealing with accidental pol-

117. *Id.* at 171.

118. *Id.* at 173; *see also supra* fig. 4 (typical MARPOL tanker); *infra* notes 218-27 and accompanying text (discussion of current, or MARPOL, standards).

119. Dillon, *supra* note 80, at 321 (comments of D.P. Roseman).

120. 36 Fed. Reg. 24,960 (1971) (proposed Dec. 24, 1971).

121. Water Quality Improvement Act of 1970, Pub. L. No. 91-224, sec. 102, § 11(j)(1), 84 Stat. 91, 96 (codified as amended at 22 U.S.C.A. § 1321(j)(1)(C) (West 1986 & Supp. 1991)).

lution would have required double sides on all inland barges<sup>122</sup> built after December 31, 1972. This requirement would apply to both new and rebuilt vessels and was "expected to substantially reduce the oil spills resulting from minor vessel collisions."<sup>123</sup> The proposed rulemaking also noted that "[t]his type of construction has been required for some years for vessels carrying flammable chemical products and has not created any safety problems such as explosions or fires from flammable vapors in the void spaces."<sup>124</sup>

Following a public hearing in February 1972, the Coast Guard announced that it would suspend implementation of the proposed double-side requirement pending completion of a study it was conducting jointly with the Maritime Administration to examine costs and alternatives.<sup>125</sup> The reason for the postponement was that "[t]he inland barge industry entered strong objection to the proposed requirements for double wall construction of inland tank barges. The basis of the objection is that the costs have neither been adequately investigated nor has a case been made that double wall construction would significantly reduce oil pollution."<sup>126</sup>

The joint Coast Guard/Maritime Administration study was finally completed in late 1974.<sup>127</sup> In fiscal year 1973, 208 single-skin barge casualty incidents were reported to the Coast Guard, of which seventy-six caused at least some pollution.<sup>128</sup> In contrast, sixty-one double-hulled barges were reported that year as casualties, but only one polluted.<sup>129</sup> The study concluded from these statistics that double-hull barges were effective in preventing 95.5 percent of expected tank barge spills,<sup>130</sup> and the Coast Guard later concluded that based on this study "approximately 80% of the volume of tank barge oil pollution can be eliminated by a double hull construction standard with a 24 inch separation of hulls."<sup>131</sup> A survey of 678 other tank barge damage incidents, minor casualties which did not meet the requirements for automatic reporting

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This Act amended the Federal Water Pollution Control Act, ch. 758, 62 Stat. 1155 (codified as amended at 33 U.S.C.A. §§ 1251-1387 (West 1986 & Supp. 1991)).

122. Tank barges, both inland and seagoing, are vessels which carry oil in bulk and are not self-propelled.

123. 36 Fed. Reg. 24,960, 24,961 (1971).

124. *Id.*

125. 37 Fed. Reg. 28,250, 28,252 (1972).

126. *Id.*

127. OFFICE OF DOMESTIC SHIPPING, MARITIME ADMINISTRATION & OFFICE OF MERCHANT MARINE SAFETY, U.S. COAST GUARD, JOINT MARITIME ADMINISTRATION/COAST GUARD TANK BARGE STUDY (1974) [hereinafter TANK BARGE STUDY].

128. *Id.* at 14.

129. *Id.*

130. *Id.*

131. Proposed Design Standards for Tank Barges to Prevent Oil Pollution, 44 Fed. Reg. 34,440, 34,441 (1979).

to the Coast Guard,<sup>132</sup> concluded that double-hull barges were effective in preventing 96.6 percent of expected tank barge spills.<sup>133</sup>

The study also examined the costs associated with either the retrofitting or the new construction of vessels with double sides and double hulls. The economic impact of retrofitting the then-existing barge fleet of 1902 single-skin barges was estimated at \$90.7 million for double sides and at \$226.4 million for double hulls.<sup>134</sup> Decreased cargo carrying capacity was estimated at between ten and thirty percent for double-sided retrofits and at twenty-five to forty percent for double hulls.<sup>135</sup> The study said "these volume losses are equivalent to a new construction requirement of 285 and 570 barges, [respectively,] to retain constant fleet capacity."<sup>136</sup>

It is important to note that the study considered neither the costs associated with spills, such as cleanup, lost oil, and penalties, nor the environmental benefits to be gained by preventing pollution in the first place.<sup>137</sup> With this limitation, the study concluded that the retrofit cost of preventing each penetration of a tank barge would be \$17,925 for double sides and \$29,251 for double hulls.<sup>138</sup> Over twenty-five years, if new construction of double-hull barges were required, the cost per penetration avoided would drop to \$9039.<sup>139</sup>

Despite the conclusions reached in the joint study, the Coast Guard took no further action regarding tank barges for almost five years. In 1979, the Coast Guard officially withdrew the December 1971 proposal discussed above.<sup>140</sup> After reviewing the history of the original proposal, opposition to the proposal by the tank barge industry, and the results of the joint Maritime Administration/Coast Guard study, the Coast Guard proposed two new regulations: one requiring double hulls for all new tank barges of 20,000 DWT or less,<sup>141</sup> and one for existing vessels which did not require double hulls.<sup>142</sup>

The proposed regulations requiring double hulls for all new vessels of the listed size were considered by the Coast Guard to be "necessary for all barges regardless of the route they are certificated for," due to the

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132. TANK BARGE STUDY, *supra* note 127 at 4.

133. *Id.* at 14.

134. *Id.* at 12.

135. *Id.* at 9.

136. *Id.* at 9.

137. *Id.* at 11.

138. *Id.* at 12.

139. *Id.*

140. 44 Fed. Reg. 34,440 (1979).

141. *Id.* at 34,441-42. Other regulations already applied to larger carriers. *Id.* at 34,441; see also 33 C.F.R. pt. 157 (1979) (prescribing design, equipment, and operation requirements for tank vessels which carry oil in bulk).

142. Proposal for Existing Tank Barges to Prevent Oil Pollution, 44 Fed. Reg. 34,443 (1979) (Advance Notice of Proposed Rulemaking).

benefits indicated by the tank barge study.<sup>143</sup> The proposal dealt with safety concerns by setting the minimum spacing between hull and cargo tanks of twenty-four inches (to facilitate inspection and maintenance) and setting minimum stability standards in case of damage to the outer hull.<sup>144</sup> The Coast Guard also completed an extensive Regulatory Analysis evaluating the cost of the rules.<sup>145</sup>

Largely due to pressure from the tank barge industry, the Coast Guard passed up the opportunity to require double hulls on existing barges. As to the proposed regulations for existing barges, the Coast Guard noted that representatives from the tank barge industry, commenting on the December 1971 proposal, had "decried effecting the phaseout [of single-skin barges] by proscribing the 'rebuilding' of single hull barges."<sup>146</sup> The alternative, termination, found "equal opposition," although the oil barge industry proffered no comments suggesting additional alternative approaches.<sup>147</sup> The Coast Guard reiterated that "many studies . . . have clearly shown a need to accelerate the normal attrition of single hull tank barges to achieve a timely realization of the potential reduction in oil pollution that a double hull tank barge fleet would provide."<sup>148</sup> Yet, despite this affirmation, the Coast Guard made the rather startling statement that it

has made no firm commitment to the proposals advanced in this document. These proposals represent an initial effort to find a means to more rapidly realize the environmental benefits which *will* result from a double hull tank barge fleet, while not creating an undue burden upon the tank barge industry.<sup>149</sup>

The Coast Guard further weakened its regulations by allowing a long-term phaseout of single-hull vessels. The proposed regulations would have phased out single-skin barges over a period of years, resulting in a thirty-one percent increase in costs for the industry as a whole.<sup>150</sup> While recognizing that since 1971 "valuable time has been lost to make a gradual transition to an environmentally safer tank barge fleet by 1985," the Coast Guard stated that "from a practical viewpoint, it is unacceptable to impose 1985 as the limit for use of all single hull barges."<sup>151</sup> Thus, the phaseout schedule would be substantially relaxed.

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143. 44 Fed. Reg. 34,441 (1979).

144. *Id.*

145. *Id.* at 34,442.

146. *Id.* at 34,444.

147. *Id.*

148. *Id.*

149. *Id.* (emphasis added).

150. *Id.* at 34,446.

151. *Id.* at 34,445.

Finally, the Coast Guard significantly eased any remaining restrictions in its proposed rule by inviting the industry to generate a list of exemptions to it. Explaining its approach, the Coast Guard said:

It is recognized that there are some products, *defined as oil*, which have physical or chemical properties that make the probability of large spills occurring as a result of hull damage less likely. It appears that there may be an appreciable number of products which, with the proper precautions or operational procedures, could be [safely] transported in single hull barges."<sup>152</sup>

In 1980, the Coast Guard again postponed action on these regulations pending another study, this time by the National Academy of Sciences.<sup>153</sup>

In the end, the Coast Guard abandoned its attempts to require double hulls. The ten-year effort to impose construction standards on tank barges, new and existing, finally ended in 1982, when the Coast Guard withdrew both proposals.<sup>154</sup> The cited reasons were financial impacts (especially on smaller operators) and barge industry comments "overwhelmingly in opposition" to the proposals.<sup>155</sup> Instead, it was suggested that increased inspections of barges was a possible solution to the admitted pollution problem posed by those vessels.<sup>156</sup> At bottom, the Coast Guard concluded, the previous proposals were "too broad and all encompassing."<sup>157</sup>

#### B. *NEPA Suit and Settlement: EDF v. Peterson*

In the meantime, private litigants also sought to force the double-hull issue in the courts. The Maritime Subsidy Board (the MSB), under the aegis of the Commerce Department, was authorized under the Merchant Marine Act of 1970<sup>158</sup> to provide subsidies for the design, planning, and construction of oil-carrying vessels. In 1972, the MSB signed contracts with several shipyards and purchasers providing subsidies for the construction of thirteen tankers, including six supertankers.<sup>159</sup> Within months, public interest groups filed suit<sup>160</sup> to compel the

152. *Id.* (emphasis added).

153. 45 Fed. Reg. 16,438 (1980).

154. Withdrawal of Proposals for Prevention of Oil Pollution for New and Existing Tank Barges, 47 Fed. Reg. 12,829 (1982).

155. *Id.*

156. *Id.* at 12,831.

157. *Id.* at 12,830.

158. Pub. L. No. 91-469, 84 Stat. 1018 (codified as amended at 46 App. U.S.C.A. §§ 1101-1295g (West Supp. 1991)).

159. Robert K. Huffman, *The Opportunities for Environmentalists in the Settlement of NEPA Suits*, [1974] 4 *Envtl. L. Rep.* (Envtl. L. Inst.) 50,001, 50,003 (May 1974).

160. The Center for Law and Social Policy, the Environmental Defense Fund, the Natural Resources Defense Council, and the National Parks and Conservation Association filed suit in federal court. *Environmental Defense Fund v. Peterson*, [1974] 4 *Envtl. L. Rep.* (Envtl. L. Inst.) 20,298 (D.D.C. Jan. 8, 1973).



MSB to complete an environmental impact statement for the project as required by the National Environmental Policy Act of 1969 (NEPA).<sup>161</sup> The goal of the suit was to force the MSB to consider design alternatives, including double bottoms, sides, or hulls, which could reduce marine pollution.

The parties entered into a settlement agreement on January 8, 1973. Under the agreement, the plaintiffs dropped demands for a full environmental impact statement on the existing contracts.<sup>162</sup> In return, the Maritime Administration would prepare an economic feasibility study to determine whether incorporation of double hulls, bottoms, or other alternative designs would "adversely affect the economic viability" of previously contracted vessels.<sup>163</sup> The plaintiffs agreed not to challenge the Administration's failure to adopt any design alternatives found by that study to be infeasible.<sup>164</sup> The Administration's Economic Feasibility Analysis ultimately found that all of the proposed pollution-preventive devices, except the inert gas systems, would "unduly burden the competitiveness" of the vessels.<sup>165</sup> The settlement also required a full environmental impact statement addressing future subsidies and the remaining contract vessels.<sup>166</sup> The Maritime Administration declined to require those changes as well. The plaintiffs did not appeal these findings.<sup>167</sup>

Thus, one result of the settlement was to "reject the development of major anti-pollution design changes prior to the implementation by the Coast Guard of the Ports and Waterways Safety Act" in 1972.<sup>168</sup> Even as one avenue was closed off in the early 1970's, however, other efforts to prevent marine pollution were launched.

### C. *The Trans-Alaska Pipeline: Promises of Marine Safety*

After massive oil deposits were discovered on the North Slope of Alaska in 1968, two alternative pipeline routes were proposed to deliver that oil to the lower forty-eight states. One route would have traversed Canada, terminating in the upper midwestern portion of the United States. The ultimately successful alternative was to build a pipeline to Valdez, where a terminal would load the oil onto tankers for ocean transport to west coast ports. While both routes promised environmental damage, many environmentalists and Canadian officials expressed deep

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161. Pub. L. No. 91-190, 83 Stat. 852 (codified as amended at 42 U.S.C.A. §§ 4321-4370c (West 1977 & Supp. 1991)).

162. *EDF v. Peterson*, [1974] 4 *Env'tl. L. Rep.* (Env'tl. L. Inst.) at 20,298.

163. *Id.* at 20,300.

164. *Id.* at 20,301.

165. Huffman, *supra* note 159, at 50,015.

166. [1974] 4 *Env'tl. L. Rep.* (Env'tl. L. Inst.) at 20,299.

167. Huffman, *supra* note 159, at 50,015.

168. *Id.* at 50,015-16; *see also supra* notes 49-56 and accompanying text (discussing implementation of the PWSA).

concern over the potential threat posed by the marine leg of the Trans-Alaska alternative.

Some argued that Alaska-trade tankers ought to be required to have double bottoms. The Secretary of the Interior, Rogers C.B. Morton, in announcing approval of the Trans-Alaska route, promised that strict regulations were being developed to minimize the threat of marine pollution posed by supertankers.<sup>169</sup> Later, Secretary Morton explicitly promised that Alaska-trade vessels would be equipped with double bottoms.<sup>170</sup>

The Departments of Interior and Transportation and the Coast Guard all clung to this theme in congressional hearings on the two alternative routes. In a letter dated April 4, 1973, Secretary Morton argued:

The environmental risks involved in the Alaska route are not insurmountable. They can be guarded against . . . . Moreover, we are insisting that operation of the maritime leg be safer than any other maritime oil transport system now in operation. If our West Coast markets don't receive their oil from Alaska in U.S. tankers that comply with the requirements we are imposing, their oil will probably be imported in foreign flag tankers that are built and operated to much lower standards.<sup>171</sup>

During 1973 hearings by the House Subcommittee on Public Lands, Deputy Undersecretary of the Interior Jared Carter continued to give assurances that strict vessel construction standards would be mandated for Alaska-trade vessels. Responding to a question posed by Congressman Dellenback (Oregon), Carter said that:

Secretary Morton [Interior] and Secretary Volpe [Transportation] discussed this whole question before last June and in Secretary Morton's appearance before the Joint Economic Committee, he outlined some rather comprehensive plans for dealing with the tanker route to assure that these tankers are constructed and operate in the safest possible manner on this leg.

Now, exactly what the detailed regulations on the tanker construction will be is a matter that the Department of Transportation has been looking into, and has recently come out with a projected rulemaking . . . that will get into this question of double-bottom construction . . . .<sup>172</sup>

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169. TOWNSEND & HENEMAN, *supra* note 4, at 7 (citing Rogers C.B. Morton, Secretary of the Interior, statement concerning application for a Trans-Alaska Pipeline right of way, May 11, 1972 (DOI news release)).

170. *Id.*

171. S. REP. NO. 207, 93d Cong., 1st Sess. 102 (1973), *reprinted in* 1973 U.S.C.C.A.N. 2508, 2509-10 (Letter from Rogers C.B. Morton, Secretary of the Interior, to all Senators (Apr. 4, 1973)).

172. *Oil and Natural Gas Pipeline Rights of Way, Part I: Hearings on H.R. 9130 before the Subcomm. on Public Lands of the House Comm. on Interior and Insular Affairs*, 93d Cong., 1st Sess. 464 (1973) [hereinafter *Hearings*] (statement of Jared Carter, Deputy Undersecretary of the Interior). The projected rulemaking referred to was a Coast Guard proposal published at 38 Fed. Reg. 2467 (1973) (proposed Jan. 26, 1973). See *infra* part V.A.

Congressman Dellenback continued to pursue the issue. As he correctly perceived, in choosing between the two routes, the assumptions regarding environmental damage which underlay the analysis of each alternative were crucial. Since the Canadian route was overland and significantly longer (about four times the Alaska pipeline), many considered the Alaska route environmentally superior, *if the marine leg could be made safe*.

Congressman Dellenback next asked, "Are you now assuring this committee that no additional legislation is necessary in order to be sure [that] tanker construction, handling at the ports, construction of the pipeline itself, can be insisted upon . . . ?"<sup>173</sup>

Deputy Undersecretary Carter responded, "Yes, sir."<sup>174</sup> The Congressman continued:

[N]ow we are to a crucial thing, because you are predicating your environmental stand, Mr. Whitaker [Undersecretary of Interior] on the fact that certain things will be done in the way of . . . tanker construction. Now, it is one thing to say if all of these things be done, then the Alaska route is at least as safe as, and possibly safer than, the trans-Canadian.<sup>175</sup>

Undersecretary Whitaker answered, "No; I am saying they will be done and no further legislation is required . . . ."<sup>176</sup>

Congressman Dellenback next asked pointedly, "Are you in a position to make a flat statement that no additional legislation is necessary in this field, or do we have to look to the Secretary of Transportation to make that statement?"<sup>177</sup> Carter answered, "It is our very firm opinion that sufficient legislative authority exists to deal with all of these problems adequately . . . ."<sup>178</sup>

Dellenback pushed further: "I want it before this subcommittee, and before this full committee, that adequate authority exists not only to have promises made but the power to insist in the executive department that those promises be kept."<sup>179</sup> Carter replied, "Yes, sir; that authority does exist now."<sup>180</sup>

As a final point of clarification, Dellenback asked whether that authority applied to construction standards for the tankers which would be necessary if the Trans-Alaska route were chosen.<sup>181</sup> The response by Carter confirmed that the necessary authority existed.<sup>182</sup>

173. *Hearings, supra* note 172, at 465 (statement of Rep. Dellenback).

174. *Id.* (statement of Jared Carter, Deputy Undersecretary of the Interior).

175. *Id.* (statement of Rep. Dellenback).

176. *Id.* (statement of John C. Whitaker, Undersecretary of Interior).

177. *Id.* (statement of Rep. Dellenback).

178. *Id.* (statement of Jared Carter, Deputy Undersecretary of the Interior).

179. *Id.* at 466 (statement of Rep. Dellenback).

180. *Id.* (statement of Jared Carter, Deputy Undersecretary of the Interior).

181. *Id.* (statement of Rep. Dellenback).

182. *Id.* at 466 (statement of Jared Carter, Deputy Undersecretary of the Interior).

This theme was continued in testimony by the President of Alyeska Pipeline Service Company. He reiterated the superiority of U.S.-flag tankers and again referred to the pending Coast Guard regulations which would, in his words, "reduce even these modest risks [of tanker oil spills] before pipeline operation begins."<sup>183</sup>

The Coast Guard was reluctant to publish or enforce any new tanker safety standards, however. Signs of hesitation regarding the proposed regulations soon became apparent.<sup>184</sup> In his letter, Admiral Benkert stated, "one thought in Secretary Morton's letter . . . does cause some concern: i.e., that the Coast Guard will publish regulations specifically addressing construction standards for tankers engaged in the marine leg of the Trans-Alaska Pipeline System."<sup>185</sup> Benkert then claimed that the PWSA required the Coast Guard to await the results of an upcoming international conference on oil pollution.<sup>186</sup> He asserted that unilateral action regarding vessel construction standards was authorized only in the event the agreement reached at the Conference was unacceptable.<sup>187</sup> Finally, Benkert's letter proposed a draft response to a letter received from Congressman Dellenback.

On May 15, 1973, Dellenback, still concerned about the marine leg of the Alaska route, wrote to the Secretary of the Interior. Secretary Morton responded by reaffirming his testimony before the Joint Economic Committee in 1972 that the marine leg would be the safest in the world.<sup>188</sup> He also noted that the Secretary of Transportation (now Secretary Brinegar) and the Coast Guard continued to cooperate with Interior.<sup>189</sup>

Although Morton's letter to Dellenback contained subtle signs that Interior was backing off its initial assurances of strict construction standards, those signs were far less obvious than those in the letter between the Coast Guard and Interior Department previously discussed. For the first time, Interior stated that it had "no express authority to require that tankers used on the . . . marine leg be constructed to certain specifications."<sup>190</sup> Nonetheless, Secretary Morton pointed to the rules recently proposed by the Coast Guard, which would require segregated ballast

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183. *Id.* at 526 (statement of E.L. Patton, President, Alyeska Pipeline Service Co.).

184. Letter from W. M. Benkert, Rear Admiral, U.S. Coast Guard, to Jared G. Carter, Deputy Undersecretary of the Interior (June 20, 1973), in *Hearings, supra* note 172, at 1653 [hereinafter Benkert Letter].

185. *Id.*

186. *Id.* For discussion of the results of the IMCO conference, see *infra* part IV.

187. Benkert Letter, *supra* note 184.

188. Letter from Rogers C.B. Morton, Secretary of the Interior, to Hon. John Dellenback (June 22, 1973), in *Hearings, supra* note 172, at 191.

189. *Id.*

190. *Id.*

space and double bottom construction,<sup>191</sup> as proof that the promised protection would be put in place by the mid-1970's.<sup>192</sup>

The Alaska route was finally approved by the 93d Congress in the Trans-Alaska Pipeline Authorization Act (TAPAA).<sup>193</sup> If the legislators who approved the Trans-Alaska route made the decision not to include more specific construction standards based upon the assumption that the Coast Guard and/or the parties to the upcoming international convention would do so, their reliance was clearly misplaced. Vessel construction standards were dealt with in a "miscellaneous" title (section 401).<sup>194</sup> Section 401 revised PWSA provisions, which required only that the Coast Guard establish standards by January 1, 1976, preferably in harmony with international agreements.<sup>195</sup> It did not require double hulls, bottoms, or sides, nor did it specify that vessels on the marine leg of the Trans-Alaska route meet any particular standards.<sup>196</sup> Moreover, if the basis for choosing the Alaska route over the Canadian was its extraordinarily safe marine leg, the failure to establish that level of protection may mean that, in fact, the less environmentally sound route was chosen for the transport of Prudhoe Bay crude.

#### *D. Another Coast Guard Proposal: Double Bottoms on Tankers*

As discussed above, while legislators were debating the efficacy of the Trans-Alaska Pipeline, and shortly after the settlement of *EDF v. Peterson*, the Coast Guard published an Advance Notice of Proposed Rulemaking dealing with tankers (the earlier proposal dealt only with tank barges), pursuant to the Ports and Waterways Safety Act of 1972.<sup>197</sup> The Coast Guard proposed to adopt regulations which would require all

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191. 38 Fed. Reg. 2467 (1973). See *infra* part III.D for the fate of these proposed regulations.

192. 38 Fed. Reg. 2467 (1973).

193. Pub. L. No. 93-153, 87 Stat. 576 (1973).

194. *Id.* § 401, 87 Stat. at 589.

195. Pub. L. No. 92-340, sec. 201, § 4417a(7)(C), 86 Stat. 424, 430 (1972).

196. TAPAA § 401 amended the PWSA as follows:

(C) Rules and regulations published pursuant to subsection (7)(A) shall be effective not earlier than January 1, 1974, with respect to foreign vessels and United States-flag vessels operating in the foreign trade, unless the Secretary shall earlier establish rules and regulations consonant with international treaty, convention, or agreement, which generally address the regulation of similar topics for the protection of the marine environment. In absence of the promulgation of such rules and regulations consonant with international treaty, convention, or agreement, the Secretary shall establish an effective date not later than January 1, 1976, with respect to foreign vessels and United States-flag vessels operating in the foreign trade, for rules and regulations previously published pursuant to this subsection (7) which he then deems appropriate. Rules and regulations published pursuant to subsection (7)(A) shall be effective not later than June 30, 1974, with respect to United States-flag vessels engaged in the coastwise trade.

Trans-Alaska Pipeline Authorization Act, Pub. L. No. 93-153, § 401, 87 Stat. 576, 589 (1973).

197. 38 Fed. Reg. 2467 (1973).

new tankers to be constructed with segregated ballast capability<sup>198</sup> to be achieved, in part, by a double bottom.<sup>199</sup>

Soon thereafter, the Coast Guard postponed any further action on the above proposal in order to await the outcome of the International Conference on Marine Pollution scheduled for October of 1973.<sup>200</sup> The decision was based on a provision in the PWSA providing that the establishment of rules and regulations consonant with international treaties, conventions, or agreements are preferable.<sup>201</sup> Before considering the fate of the proposed Coast Guard rule, we shall first examine the international conference and the broader context of international law.

#### IV

##### INTERNATIONAL EFFORTS: IMCO CONFERENCES 1973/1978

As was noted in the Coast Guard decision postponing unilateral U.S. action on the issue of double bottoms, there is a strong need for international agreement on applicable vessel construction standards. There are several reasons for this. First, from a practical perspective, a single ship visiting ports in various countries over the course of a year would be hard pressed to comply with a multiplicity of potentially conflicting construction standards imposed by each port state.<sup>202</sup> Second, unilateral action could harm U.S. shipping interests and adversely affect U.S. oil prices and supply. Finally, even if a state could entirely eliminate pollution within its jurisdiction, without international controls the state would be powerless to protect itself from discharges of oil occurring just beyond its territorial waters.<sup>203</sup>

An exhaustive examination of international maritime law is clearly beyond the scope of this comment. Nonetheless, some understanding of the subject is essential in order to grasp the basis for claims asserting the need for international standards and the alleged dangers of unilateral action. This part of the comment briefly discusses general principles and sources of maritime law, then turns to the particular agreements relevant to pollution-preventive vessel construction standards.

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198. See *supra* note 77 for a definition of segregated ballast. See generally *supra* fig. 4 (tanker diagram). Segregated ballast tanks eliminate a great deal of intentional oil pollution which results from carrying ballast in emptied cargo tanks; when emptied, the tanks discharge a mixture of oil and seawater. See *supra* note 77.

199. 38 Fed. Reg. 2467 (1973).

200. 38 Fed. Reg. 17,848 (1973).

201. Pub. L. No. 92-340, sec. 201, § 4417a(7)(C), 86 Stat. 424, 430 (1972).

202. Sally A. Meese, *When Jurisdictional Interests Collide: International, Domestic, and State Efforts to Prevent Vessel Source Oil Pollution*, 12 OCEAN DEV. & INT'L L.J. 71, 86 (1982).

203. *Id.* at 92. Territorial waters extend 12 miles from the coast of the port state. In this zone, the port state may exercise a great deal of control over the ships of other nations. See *id.* at 89-90.

The dominant maritime notions of freedom of the seas and near-exclusive flag state control over vessels form the backdrop against which any discussion of efforts to regulate marine transport must take place.<sup>204</sup> That industry itself is, of course, international in scope, representing a high percentage of tankers entering U.S. ports. Flags of convenience<sup>205</sup> are becoming more and more common in the merchant shipping industry. While a vessel is subject to flag state control in almost all matters, including pollution control, a port state can exert some authority over other nations' vessels while they are in the port state's territorial waters or ports.<sup>206</sup> Generally, as one proceeds seaward from the port, the jurisdiction of the port state diminishes.<sup>207</sup>

Two general principles underlie international maritime law. First, all nations have a duty to prevent pollution of the sea. Second, nations must use the sea in a reasonable manner so as not to adversely affect the ocean interests of other nations.<sup>208</sup> Further elaboration of these principles is found in a variety of treaties, conventions, and agreements entered into over the years by the major maritime nations.<sup>209</sup>

The international maritime agreement relevant for purposes of this comment is the 1973 International Convention for the Prevention of Pollution from Ships and its subsequent protocols.<sup>210</sup> The Convention is the result of an international conference held in the fall of 1973 under the auspices of the United Nations' Intergovernmental Maritime Consultative Organization (IMCO), now called the International Maritime Organization (IMO). The stated goal of the conference was "the achievement by 1975, if possible, but certainly by the end of the decade, of the complete elimination of the willful and intentional pollution of the sea by oil . . . and the minimization of accidental spills."<sup>211</sup>

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204. *Id.* at 85; OTA STUDY, *supra* note 16, at 72.

205. "Flags of convenience" refer to vessels registered in countries (e.g. Liberia) which provide tax incentives to owners and have either low or nonexistent labor and wage requirements. Meese, *supra* note 202, at 82-83.

206. OTA STUDY, *supra* note 16, at 72.

207. Meese, *supra* note 202, at 87. The tension between freedom of navigation and state sovereignty over territorial seas resulted in development of the concept of the "right to innocent passage" adopted in the Convention on the Territorial Sea and the Contiguous Zone, Apr. 29, 1958, 15 U.S.T. 1606, 516 U.N.T.S. 206 (entered into force Sept. 10, 1964). Meese, *supra* note 202, at 87. Pollution prevention is one of the interests of the coastal state which must be observed by a ship in innocent passage. *See id.*

208. OTA STUDY, *supra* note 16, at 73.

209. *See, e.g.,* Meese, *supra* note 202, at 85-93; OTA Study, *supra* note 16, at 72-80; Cheng-Pang Wang, *A Review of the Enforcement Regime for Vessel-Source Oil Pollution Control*, 16 OCEAN DEV. & INT'L L.J. 305 (1986).

210. International Convention for the Prevention of Pollution from Ships, *opened for signature* Nov. 2, 1973, 12 I.L.M. 1319, modified by Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, Feb. 17, 1978, 17 I.L.M. 546 (entered into force Oct. 2, 1983; amended Sept. 7, 1984; Dec. 5, 1985; Dec. 1, 1987).

211. IMCO 7th Assembly, NATO/CCMS resolution A.237 (VII), Acceleration of the Maritime Safety Committee's Work Programme (MSC XXIV 19, Annex IV), October 12,

The United States delegation to the conference achieved most, but not all, of its objectives. One important U.S. failure was the inability to convince the attendees to mandate that the agreed-upon segregated ballast capability for new tankers be achieved through double bottoms. The delegation supported its proposal to the conference with a U.S. study examining the twin problems of intentional and accidental oil pollution and pointing to double bottoms as the preferred solution for VLCC's.<sup>212</sup> The study noted the conference's goal of eliminating pollution by the end of the decade, and suggested that segregated ballast could be achieved in a number of ways, including through the use of double bottoms. The study then examined a wide range of factors, including cost, to determine the best choice.

The study analyzed the major advantages and disadvantages of double bottoms, as discussed earlier in this paper. Disadvantages such as increased costs (which the study estimated at nine percent), possible explosions, and stability problems were considered. The advantages produced by double-bottom construction were found to include reduction of accidental and intentional pollution, easier cleaning, faster loading and unloading, and increased payload due to reduced residual oil in the cargo tanks.<sup>213</sup> After stating that "the configuration chosen to attain segregated ballast has a distinct effect upon the accidental pollution outflow," and considering the various designs available, the study concluded that "the choice for the double bottom becomes obvious."<sup>214</sup> Despite the data assembled and the "obvious" benefits of double bottoms, a "substantial majority" of the Technical Committee of the Convention voted against the proposal.<sup>215</sup>

The Convention ultimately agreed upon at the conference required that all new tankers (contracted for on or after January 1, 1976 or delivered on or after January 1, 1980) over 70,000 DWT have segregated ballast capacity. The required segregated ballast could be achieved in a variety of ways, subject to technical constraints for maintaining proper draft, heel, and trim.<sup>216</sup> At the time of the 1978 International Convention for the Prevention of Pollution from Ships (MARPOL) amendments, only three minor maritime nations had ratified the 1973 Convention.<sup>217</sup>

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1971.

212. SEGREGATED BALLAST TANKERS EMPLOYING DOUBLE BOTTOMS, IMCO SUPPORTING DOCS. DE.VIII/12, MP.XIV/3(c) (1973) (submission of U.S. delegation), *reprinted in Hearings*, *supra* note 172, at 226.

213. *Hearings*, *supra* note 172, at 232-33.

214. *Id.* at 231.

215. Steinman & Chappel, *supra* note 112, at 66.

216. *Id.* at 67.

217. Meese, *supra* note 202, at 91. IMCO agreements require the ratification of 15 member nations whose combined fleets must comprise over 50% of the world merchant shipping



The 1978 Protocol again rejected the U.S. proposal for double bottoms, this time called for by President Jimmy Carter following highly publicized tanker accidents in U.S. waters.<sup>218</sup> The MARPOL protocol did, however, institute a formula for locating segregated ballast on newly constructed ships, but required crude oil washing (COW)<sup>219</sup> on existing ships over 40,000 DWT rather than requiring them to be retrofitted with segregated ballast tanks.<sup>220</sup> One author has noted that the resulting formula would allow fifty-five to eighty percent of a tanker's cargo area to be left unprotected in event of a collision.<sup>221</sup>

The United States adopted the 1973/1978 MARPOL Protocol and it entered into force on December 31, 1988.<sup>222</sup> Today, about thirty-five percent of the world's tankers have segregated ballast capacity and half of those have located it protectively so as to minimize potential oil outflow.<sup>223</sup> However, in satisfying the new MARPOL requirements, and to compensate for the cargo capacity lost to the segregated ballast tanks, ship designers have made the new MARPOL tankers shorter, broader, and deeper,<sup>224</sup> resulting in several new problems. Perhaps most significantly, expected oil outflow in grounding accidents is *increased* by up to ninety percent.<sup>225</sup> Thus, similar to the perverse effects of technological innovation discussed above,<sup>226</sup> this new effort to prevent oil pollution may instead exacerbate it. Finally, at least one report has questioned the overall effectiveness of the protectively located segregated ballast design standard produced by MARPOL 1973/1978.<sup>227</sup>

## V

### REJECTION AND ABANDONMENT OF DOUBLE-HULL PROPOSALS

Although many see international accord as preferable in the area of vessel design,<sup>228</sup> the United States is not prohibited by any international

tonnage. *Id.* at 86-87.

218. The *Argo Merchant* accident near Nantucket Island in 1976 was especially well publicized. *Id.* at 94-95.

219. COW is a method of washing cargo tanks with crude oil rather than water. NRC STUDY, *supra* note 12, at 42, 335.

220. CALIFORNIA RESOURCES AGENCY, REPORT OF THE CALIFORNIA INTERAGENCY TANKER TASK FORCE 11 (1978); *see also supra* note 77 for a discussion of SBT's.

221. Meese, *supra* note 202, at 132-33 n.153 (citing OCEAN WORLD, Sept.-Oct. 1978, at 2).

222. Act to Prevent Pollution From Ships, Pub. L. No. 96-478, 94 Stat. 2297 (codified at 33 U.S.C.A. §§ 1901-1912 (West 1986 & Supp. 1991)).

223. NRC STUDY, *supra* note 12, at 43. Since MARPOL only applied to new tankers, much of the world fleet was exempt. *Id.*; *see also* fig. 4 (diagram of tankers with SBT's).

224. NRC STUDY, *supra* note 12, at 43.

225. *Id.* This phenomenon is due to greater freeboard and higher static head. For a further, scientific explanation of hydrostatic balance and its effect on oil outflow, *see id.* at 55-76.

226. *See supra* part I.A.

227. TOWNSEND & HENEMAN, *supra* note 4, at 212-13.

228. The issue of whether to require or allow the adoption of stricter standards than those

law or agreement from unilaterally imposing more stringent standards for ships entering U.S. ports or for U.S.-flag ships.<sup>229</sup> By the mid-1970's, however, efforts to mandate pollution-preventive construction standards in one arena or another were beginning to lose steam. We have already seen the failure to impose tougher regulations on tank barges, the inability to require that tankers in the newly instituted Alaska trade be fitted with double hulls or bottoms, and the failure of U.S. efforts in the international arena to impose pollution-preventive tanker construction standards. As discussed above, prior to the IMCO Conference, the Coast Guard had indicated its intent to require segregated ballast in double bottoms but postponed this action to await the results of the international meeting.<sup>230</sup>

#### A. *Aftermath of IMCO: Coast Guard Final Rules*

Following the first IMCO Conference, the Coast Guard in 1974 published a Notice of Proposed Rulemaking dealing with those tank vessels engaged in the domestic trade.<sup>231</sup> The publication noted that many comments were received, largely dealing with the high initial costs of double-bottomed vessels, the need for international agreement, and the danger of imposing such standards unilaterally.<sup>232</sup> The proposed rules continued to contain requirements for segregated ballast capacity, including size and piping arrangements, but expressly excluded the previously included double-bottom design.<sup>233</sup> The agency justified the decision as follows:

While all studies ascribe varying degrees of effectiveness to double bottoms as a means to reduce accidental oil outflows in grounding casualties, this reduction is directly related to the individual ship involved. The large number of existing vessels would preclude any immediate significant reduction in oil outflow due to requiring double bottoms [on new vessels].<sup>234</sup>

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agreed to internationally was a heavily debated issue. "[T]he United States simply cannot urge the world community to adopt tougher antipollution measures, get most of what it wants through international agreement, . . . and then return home and pass unilaterally the few things it was unable to get at the international conference." H.R. REP. NO. 1384, 95th Cong., 2d Sess., pt. 1, at 79, *reprinted in* 1978 U.S.C.C.A.N. 3270, 3317 (comments of Rep. Paul McCloskey).

The problem was that the U.S. would lose credibility in the world community and would be unable in future international gatherings to get stricter vessel safety measures passed. The issue of unilateral versus international action was raised again during debate over the Oil Pollution Act of 1990. *See infra* note 288 and accompanying text.

229. Meese, *supra* note 202, at 97; OTA STUDY, *supra* note 16, at 79.

230. *See supra* notes 197-201 and accompanying text.

231. Protection of Marine Environment, 39 Fed. Reg. 24,150 (1974) (codified at 33 C.F.R. § 151.25 and scattered sections of 33 C.F.R. pt. 157 (1991)).

232. *Id.*

233. *Id.* at 24,151-52.

234. *Id.* at 24,152.

Instead of imposing these construction requirements, the Coast Guard, in an advanced notice of a proposed rulemaking, planned to implement regulations governing ship operations in order to achieve the sought-after pollution prevention.<sup>235</sup> This alternative, which includes measures such as improved crew training, vessel maintenance, and navigational aids, has been consistently urged by opponents of double hulls.<sup>236</sup> Among other things, these rules would have required all entering and departing ships to comply with all orders of the Captain of the Port, if the Captain makes "an individual case determination" that a hazardous condition or circumstance exists. One of the factors the Captain could consider in making such a determination would be "the hull design of the vessel involved including the presence or lack of a double hull, double bottom, and cargo segregation."<sup>237</sup>

### 1. Coast Guard Challenged

In May 1975, the Natural Resources Defense Council and other environmental groups filed an action against the Secretary of Transportation and the Coast Guard alleging that the defendants had failed in their legal duty under the PWSA to make certain regulations effective by June 30, 1974.<sup>238</sup> Following the filing of the case, the Coast Guard issued final rules on October 6, 1975.<sup>239</sup> Most of the issues before the court were thus mooted, except one.<sup>240</sup>

The regulation required segregated ballast on tankers, but did not specify its arrangement or location. The court rejected the plaintiff's assertion that the regulation was not specific enough and refused to demand more specificity from the agency. In dicta, the court recognized that while some had argued that double bottoms constituted the preferable allocation of segregated ballast space, cost constraints had led others to the opposite conclusion. Noting the "seriousness of the issue, and the diversity of views in the light of the deference this Court must give to the judgment and expertise of the agency," the district court concluded that "it was not possible for the defendants to enact a more satisfactory regulation on the subject than they did."<sup>241</sup>

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235. Marine Traffic Requirements, 39 Fed. Reg. 24,157 (1974) (codified as amended at 33 C.F.R. subch. P (1991)).

236. Officials of Exxon supported this option in efforts to defeat double-hull rules. TOWNSEND & HENEMAN, *supra* note 4, at 8-9.

237. 39 Fed. Reg. 24,158 (1974).

238. NRDC v. Coleman, 411 F. Supp. 449 (D.D.C. 1975). See *supra* note 196 for the applicable PWSA deadlines.

239. Tank Vessels Carrying Oil in Domestic Trade, 40 Fed. Reg. 48,280 (1975) (codified as amended in 33 C.F.R. § 151.25 and scattered sections of 33 C.F.R. pt. 157 (1991)).

240. 411 F. Supp. at 450.

241. *Id.* at 450-51.

## 2. *The Substance of the Final Rules*

In 1975, the Coast Guard reaffirmed its decision to base the final regulations on the 1973 IMCO Conference. The rationale of that decision, mandating segregated ballast space but not double bottoms, was explained as follows: "[T]he Coast Guard decided that the Convention, although not perfect, did establish a reasonable and environmentally effective set of standards on which regulations for tank vessel construction could be based."<sup>242</sup> The Coast Guard refused to require higher standards for vessels involved in domestic, as opposed to foreign, trade. Relying on the amendments to the PWSA made by TAPAA,<sup>243</sup> the final rules noted that a number of commentators had urged the Coast Guard to distinguish between foreign and domestic trade and provide higher standards for U.S. vessels engaged in domestic trade. The Coast Guard rejected that interpretation and added:

[T]here is no safety or environmental basis for setting higher standards for U.S. domestic trade vessels since the characteristics of the operational situation external to the vessel determine the threat to the environment and to the safety of the vessel, not whether the vessel is engaged in foreign or domestic trade.<sup>244</sup>

While as a factual matter it seems clear that whether a vessel will be involved in an accident which results in pollution is largely unrelated to whether it is engaged in foreign or domestic transport, it seems equally clear that providing higher standards for tankers operating in U.S. waters has a very definite "environmental basis," especially for the Alaska trade where almost every tanker is U.S.-flagged. In fact, during the legislative debates surrounding TAPAA, assurances were repeatedly given that the Coast Guard possessed ample authority to adopt regulations ensuring that the U.S.-flag tankers in the Alaska trade would be safer than those in the rest of the world fleet.<sup>245</sup>

In the end, one is left with a sense of deep frustration. On one hand, promises of extraordinary marine safety, relying on the existence of Coast Guard authority, were given to gain approval of the Trans-Alaska route during the passage of TAPAA. On the other hand, the Coast Guard later refused to impose requirements which even the agency's own study indicated would provide effective environmental protection.<sup>246</sup> In refusing to adopt such regulations, the Coast Guard both denied that it possessed the requisite authority and argued that no environmental goal would be furthered by extra-safe U.S. tankers.<sup>247</sup>

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242. 40 Fed. Reg. 48,280 (1975).

243. Trans-Alaska Pipeline Authorization Act, Pub. L. No. 93-153, 87 Stat. 576 (1973).

244. 40 Fed. Reg. 48,280 (1975).

245. See *supra* part III.C.

246. 40 Fed. Reg. 48,280 (1975).

247. *Id.*

Eventually, the Coast Guard did adopt regulations governing the arrangement of the mandated segregated ballast space. These rules would allow double hulls, sides, or bottoms in addition to various other tank configurations to satisfy the requirement.<sup>248</sup> Similar rules governing U.S. vessels in foreign trade and foreign vessels in U.S. waters were adopted later.<sup>249</sup> It is worth remembering that when the *Exxon Valdez* grounded on Bligh Reef it "met all U.S. and international segregated-ballast requirements."<sup>250</sup>

### B. Supreme Court Rejection of Stricter State Vessel Construction Standards

In the midst of the foregoing legislative, administrative, and legal failures, both national and international, in 1975 the State of Washington adopted legislation which, among other things, governed construction standards for ships entering Puget Sound.<sup>251</sup> The law required that oil tankers between 40,000 and 125,000 DWT possess a variety of design features including "[d]ouble bottoms, underneath all oil and liquid cargo compartments," unless the tanker was in ballast or under an acceptable tug escort.<sup>252</sup>

In *Ray v. Atlantic Richfield Co.*, the Supreme Court held that Washington State's design requirements (but not the tug requirement) were preempted by congressional action in the area, namely title II of the Ports and Waterways Safety Act and its implementing regulations.<sup>253</sup> The Court recognized in a footnote that the Coast Guard had already acted pursuant to the authority granted it by the PWSA in enacting regulations<sup>254</sup> governing vessels in the domestic trade<sup>255</sup> and speculated that the Coast Guard would soon impose more stringent design standards.<sup>256</sup> The Court reasoned that

Congress, insofar as design characteristics are concerned, has entrusted to the Secretary the duty of determining which oil tankers are sufficiently safe to be allowed to proceed in the navigable waters of the United States. This indicates to us that Congress intended uniform national standards

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248. Tank Vessels Carrying Oil in Domestic Trade, 41 Fed. Reg. 1479 (1976) (codified as amended at 33 C.F.R. pt. 157 (1991)).

249. Tank Vessels Carrying Oil in Trade, 41 Fed. Reg. 54,177 (1976) (codified as amended at 33 C.F.R. pt. 157 (1991)).

250. NTSB REPORT, *supra* note 5, at 170.

251. WASH. REV. CODE §§ 88.16.170-200 (1990).

252. *Id.* § 88.16.190(2).

253. 435 U.S. 151, 161 (1978). *But cf.* *Askew v. American Waterways Operators, Inc.*, 411 U.S. 325, *reh'g denied*, 412 U.S. 933 (1973) (holding that the FWPCA did not preempt liability and other provisions of state oil pollution statute since the statutes did not conflict).

254. 435 U.S. at 162 n.12 (citing 33 C.F.R. § 157 (1977)).

255. *Id.* (citing 41 Fed. Reg. 54,177 (1976)).

256. *Id.* at 163 (citing 42 Fed. Reg. 24,868 (1977)).

for design and construction of tankers that would foreclose the imposition of different or more stringent state requirements.<sup>257</sup>

The *Ray* Court also emphasized the need for uniform national, and preferably international, standards, citing the legislative history of the PWSA.<sup>258</sup>

The court rested its holding on the finding of a direct conflict between the PWSA and the Washington tanker law, since the former law "aims precisely at the same ends" as the latter.<sup>259</sup> The state law would allow Washington to bar from its ports ships that the Coast Guard has certified as safe. This the court would not accept: "The Supremacy Clause dictates that the federal judgment that a vessel is safe to navigate United States waters prevail over the contrary state judgment."<sup>260</sup> Thus, in 1978, the Supreme Court shut off yet another potential method by which proponents of double bottoms, sides, and hulls could force the oil and shipping companies to adopt these pollution-preventive design alternatives.

### C. *Failure and Silence: Late 1970's Through 1980's*

In the late seventies a rash of tanker accidents<sup>261</sup> once again "focused public and congressional attention"<sup>262</sup> on the question of marine safety. On March 17, 1977, President Carter sent a message to Congress in which he outlined a series of proposals aimed at making the marine environment safer.<sup>263</sup> Included in the President's program was a renewed call for double bottoms on tankers, in the form of directions to the Secretary of Transportation to issue new vessel construction standards within sixty days. The Coast Guard complied by publishing a notice of proposed rulemaking on May 16, 1977.<sup>264</sup> In another familiar move, the Coast Guard postponed action on the rulemaking in March 1978, awaiting "Congressional disposition of the 1978 IMCO Protocols and . . . pending tanker legislation."<sup>265</sup>

Congress also responded to the heightened concern about tanker safety. In the first session of the 95th Congress, members introduced some twenty-seven different bills on the subject. While these bills were making their way through the legislative process, IMCO convened an-

257. *Id.*

258. *Id.* at 166.

259. *Id.* at 165.

260. *Id.*

261. For example, the *Argo Merchant* went aground southeast of Nantucket Island in 1976 and spilled 225,000 barrels of heating oil. See NRC STUDY, *supra* note 12, at 15, 17.

262. H.R. REP. NO. 1384, 95th Cong., 2d Sess., pt. 1, at 5 (1978), *reprinted in* 1978 U.S.C.C.A.N. 3270, 3273.

263. See generally *id.* at 6-7, *reprinted in* 1978 U.S.C.C.A.N. at 3275.

264. Tank Vessels Carrying Oil in Trade, 42 Fed. Reg. 24,868 (1977) (codified as amended at 33 C.F.R. pt. 157 (1991)).

265. Meese, *supra* note 202, at 95.

other conference, at the urging of the United States, to try once again to reach an agreement which the major maritime nations could live with. The conference, which concluded in London in February 1978, succeeded in adopting stronger safety and construction standards for tankers but ultimately fell short of President Carter's proposals. Again, no mandatory double-bottom standard was adopted.<sup>266</sup>

Eventually, Congress passed the Port and Tanker Safety Act of 1978 (the PTSA),<sup>267</sup> amending the Ports and Waterways Safety Act of 1972.<sup>268</sup> The PWSA, Congress noted, had been generally ineffective and confusing, with the result that the Coast Guard had proceeded "rather slowly" and was often criticized for failing to carry out its mandate.<sup>269</sup> While the original Senate version contained a double-bottom requirement, the final bill did not. Instead, the PTSA adopted standards generally consistent with those agreed to at the 1978 IMCO conference.<sup>270</sup> Nonetheless, the PTSA did go beyond the MARPOL standards in some respects.<sup>271</sup>

Finally, the Act clarified the authority of the Secretary of Transportation to promulgate standards stricter than those reached in international accords.<sup>272</sup> The act required that the Secretary adopt vessel construction standards that comply with the "best available technology."<sup>273</sup> Whether the latter standard would require double bottoms or hulls on tankers remained to be seen.

The decade closed with plans for yet another study on the efficacy of double hulls. In a message to Congress given August 2, 1979, President Carter discussed a variety of environmental issues, including oil pollution.<sup>274</sup> Echoing a now-familiar theme, the President stated that the re-

266. Instead, new ships would have to have segregated ballast space "protectively located" so as to minimize accidental outflows, and existing ships would be required to have crude oil washing (COW) systems onboard rather than the segregated ballast retrofit proposed by Carter. *Id.* at 96.

267. Pub. L. No. 95-474, 92 Stat. 1471 (codified as amended at 33 U.S.C.A. §§ 1221-1236 (West 1986 & Supp. 1991)).

268. See *supra* notes 49-56 and accompanying text.

269. H.R. REP. No. 1384, 95th Cong., 2d Sess., pt. 1, at 5 (1978), reprinted in 1978 U.S.C.A.N. 3270, 3273.

270. *Id.* at 21, reprinted in 1978 U.S.C.C.A.N. at 3289.

271. See Meese, *supra* note 202, at 96-97.

272. As adopted, § 5 of the PTSA includes:

(6) REGULATORY AUTHORITY. —

(A) . . . The Secretary may issue differing regulations applicable to vessels engaged in the domestic trade, and may also issue regulations that exceed standards agreed upon internationally.

92 Stat. 1471, 1483 (1978).

273. Port and Tanker Safety Act of 1978, Pub. L. No. 95-474, sec. 5, § 4417a(1)(D), 92 Stat. 1471, 1480, repealed by the Partial Revision of Title 46, United States Code, Shipping, Pub. L. No. 98-84, § 4(b), 97 Stat. 500, 599-600, 605 (1983); 124 CONG. REC. 33,237 (1978); Meese, *supra* note 202, at 97.

274. *President's Message to Congress on Environmental Priorities and Programs*, [1979] 9

cent collision of two supertankers in the Caribbean underscored the importance of "effective national and international" standards governing oil tanker safety.<sup>275</sup>

After reviewing recent advances toward the goal of reduced oil pollution, including the adoption in 1978 of international and domestic standards, President Carter noted approvingly that the Coast Guard was undertaking a study of past accidents to "evaluate further the usefulness of double bottom and side protection in reducing oil spills."<sup>276</sup> Thus, once again, the response to supertanker spills was increased concern and a new study. No further action was taken on the issue during Carter's presidency.

The 1980's began, prophetically, with the withdrawal of tank barge rules requiring double bottoms, newly proposed in 1979.<sup>277</sup> Silence on the issue prevailed throughout the 1980's until yet another devastating supertanker casualty occurred—on Bligh Reef in Prince William Sound. That incident set off a chain of events beginning with an environmental and public relations disaster. Following a frenzy of legislative activity, a comprehensive new piece of oil spill legislation was born.

## VI

### THE OIL POLLUTION ACT OF 1990: RESURGENCE OF ACTIVITY FOLLOWING THE *EXXON VALDEZ* DISASTER

While almost every Congress since 1975 has considered comprehensive bills regarding oil pollution control, such efforts were stalled until 1989.<sup>278</sup> Then "widespread fury over the March 24 spill by the supertanker *Exxon Valdez*" drove members of Congress to adopt "a much tougher oil spill bill than it had ever passed."<sup>279</sup>

#### A. *Legislative History of OPA 1990*

Both Houses of Congress eventually passed similar bills.<sup>280</sup> The most significant difference between the two bills, which later proved to be

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Envtl. L. Rep. (Envtl. L. Inst.) 50,017 (Aug. 2, 1979).

275. *Id.* at 50,020.

276. *Id.*

277. Withdrawal of Proposals for Prevention of Oil Pollution for New and Existing Tank Barges, 47 Fed. Reg. 12,829 (1982). The promulgated proposals had been published at 44 Fed. Reg. 34,440, 34,443 (1979).

278. Gary V. Perko, *Spillover from the Exxon Valdez: North Carolina's New Offshore Oil Spill Statute*, 68 N.C. L. REV. 1214, 1219 (1990).

279. George Hager, *Tough Oil-Spill Measure Rides Atop Environmental Wave*, 47 CONG. Q. 3043, 3043 (1989).

280. The Senate bill passed August 4, 1989, on a vote of 99-0. S. 686, 101st Cong., 1st Sess. (1989). The House passed its version on November 9, 1989, on a 375-5 vote. H.R. 1465, 101st Cong., 1st Sess. (1989).



a major obstacle to approval, centered on whether and when to mandate double bottoms or hulls on tankers. "The House approved, by voice vote, an amendment that would require all [existing] tankers carrying oil to U.S. ports to have double bottoms within seven years and double hulls within 15 years."<sup>281</sup> All new tankers would be required to be constructed with double hulls. The Senate initially rejected this drastic option, instead calling on the Department of Transportation to require such construction only if a study found significant pollution prevention would result.<sup>282</sup>

This time, throughout the debate over the double-hull issue, members in both houses referred back to the history of the passage of TAPAA.<sup>283</sup> Clearly many legislators felt betrayed by the unfulfilled promises of tanker safety made then and were determined to avoid the same result this time around.<sup>284</sup> Members were also frustrated that after so many years and so many studies, the issue of double hulling was still being debated.<sup>285</sup>

The House reiterated its strong support for the double-hull measure when, on a nonbinding vote in February 1990, it instructed the House conferees to insist on such a provision in negotiations with Senate representatives over the final bill.<sup>286</sup> On the other hand, "[t]he shipping and oil industries and the Bush administration much prefer[red] the Senate version."<sup>287</sup> International groups were also unhappy with potential U.S. imposition of unilateral standards as well.<sup>288</sup> The International Chamber of Shipping spearheaded opposition to both the Senate and House bills.<sup>289</sup>

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281. Hager, *supra* note 279, at 3044.

282. *Id.*

283. *See supra* part III.C.

284. 135 CONG. REC. E1793 (daily ed. May 18, 1989) (statement of Rep. McDermott).

285. *See, e.g.*, 136 CONG. REC. S4534 (daily ed. Apr. 19, 1990) (statement of Sen. Adams).

286. *House Members Support Double Hulls for Ships*, 48 CONG. Q. 388 (1990).

287. Phil Kuntz, *Recent Oil Spill Adds Force to Calls for Double Hulls*, 48 CONG. Q. 655 (1990); *see also* letter from Samuel Skinner, Secretary of Transportation, to House conferees (May 9, 1990).

288. Before passage of the OPA, only Finland had national standards exceeding international requirements, imposing a heavy surcharge on crude imported in single-skin tankers. *See Tankers Operating in U.S. Waters Would Be Outfitted with Double Hulls*, 13 Int'l Env't Rep. (BNA) 323 (Aug. 8, 1990). Since its passage, a federally appointed panel in Canada has recently concluded that Canada should impose a double-hull requirement even stricter than that in the OPA. *See Panel Says Tanker Traffic in Canadian Waters Should be Restricted to Double-Hulled Vessels*, 13 Int'l Env't Rep. (BNA) 470 (Nov. 7, 1990).

289. *International Shipping Groups Oppose Tanker Design Provisions in U.S. Bills*, 13 Int'l Env't Rep. (BNA) 156 (Apr. 11, 1990). The group argued that the issue of double hulls should be taken to the "rightful forum" (the IMO) for such standards and warned of the potential dangers of this type of design. *Id.* Given the industry's success in defeating all previous attempts to impose a double bottom or hull requirement in this "rightful forum," it is understandable why Congress chose, this time, to impose the standard itself.

Then, repeating a recurring theme in oil spill legislation and regulation, another major spill pushed some of the more conservative members in the direction of the tougher House bill. The spill of the *American Trader* off the coast of Huntington Beach in February of 1990 "helped shift" the position of powerful House Public Works and Transportation Chairman Glenn M. Anderson (California) (a longtime supporter of the shipping and oil industries) in favor of double hulls.<sup>290</sup> Following a tour of the spill, Rep. Anderson noted "they told us out there that if it [the *American Trader*] had a double hull, it wouldn't have ruptured."<sup>291</sup> The shipping and oil industries, meanwhile, began to accept the inevitability of some kind of new vessel construction requirement. They vowed, however, to fight for more time to implement any double-hull measure passed.<sup>292</sup>

### B. *The Resulting Legislation*

By late spring of 1990, both sides had moved closer together, and in mid-July, House and Senate conferees had worked out their differences. Congress passed the House bill, but amended it to include much of the language contained in the Senate bill. The Oil Pollution Act of 1990 was signed into law by President Bush on August 18.<sup>293</sup>

The Conference Committee substitute which became law reflected a compromise between the House and the Senate versions of the double-hull requirements. The House bill originally sent to the Conference Committee would have required all new tank vessels to be constructed with double hulls, and existing vessels to be so constructed within fifteen years of the legislation's passage.<sup>294</sup> The Senate bill by contrast would have required double hulls on new tankers *unless* the Secretary of Transportation determined that they would not enhance pollution prevention or that other measures would provide equal or greater protection.<sup>295</sup>

Section 4115 of the conference substitute required that new vessels "operating on the waters subject to the jurisdiction of the U.S. including the Exclusive Economic Zone"<sup>296</sup> be constructed with double hulls.<sup>297</sup>

290. Kuntz, *supra* note 287, at 655.

291. *Id.*

292. *Id.* at 656 (citing comments by Ernest J. Corrado, President, American Inst. of Merchant Shipping, an industry group representing tanker owners).

293. Oil Pollution Act of 1990, Pub. L. No. 101-380, 104 Stat. 484.

294. H.R. REP. NO. 653, 101st Cong., 2d Sess. 139 (1990), *reprinted in* 1990 U.S.C.C.A.N. 779-818.

295. S. REP. NO. 99, 101st Cong., 1st Sess. 4 (1989), *reprinted in* 1990 U.S.C.C.A.N. 750-52.

296. The Exclusive Economic Zone is defined as follows:

The Exclusive Economic Zone of the United States is a zone contiguous to the territorial sea, . . . [and] extends to a distance 200 nautical miles from the baseline from which the breadth of the territorial sea is measured . . . Within the Exclusive Economic Zone, the United States has, to the extent permitted by international law, . . .

Several exemptions to this blanket requirement were recognized. Vessels used to respond to discharges of oil or which are less than 5000 gross tons<sup>298</sup> and equipped with a double containment system as effective as a double hull<sup>299</sup> are both exempt from the double-hull schedule, at least initially.<sup>300</sup>

A particularly significant exemption postpones the double-hull requirement until 2015 for vessels unloading oil at licensed deepwater ports<sup>301</sup> or engaged in lightering activities<sup>302</sup> sixty miles or more from the U.S. coast.<sup>303</sup> The Conference Report noted that the deepwater port exemption is

supported by Coast Guard studies and testimony by the Chairman of the Council on Environmental Quality during congressional hearings on legislation authorizing the Federal licensing of deepwater ports. The Chairman concluded that the probability of a collision or grounding is reduced by 90 percent for vessels calling at deepwater ports located beyond 15 miles offshore.<sup>304</sup>

This exemption may not be well founded. Despite the seemingly strong support provided by the Council on Environmental Quality (CEQ) testimony, one author, in discussing the then-proposed Deepwater Port Act,<sup>305</sup> questioned the reliability of estimates based on the CEQ study.<sup>306</sup> The problem with the study's findings was that they were "based on the assumptions that double bottoms will be mandatory for

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jurisdiction with regard to the . . . protection and preservation of the marine environment.

Proclamation No. 5030, 3 C.F.R. §§ 22-23 (1983), *reprinted in* 16 U.S.C. § 1453 (1988) (emphasis added).

297. Oil Pollution Act of 1990 § 4115(a), 104 Stat. at 517-18 (codified as amended at 46 U.S.C.A. § 3703a(a)(2) (West Supp. 1991)).

298. This equals about 10,000 DWT.

299. The NRC study "did not identify any design as superior to the double hull for all accident scenarios." NRC STUDY, *supra* note 12, at xxi. However, some committee members considered one alternative, the intermediate oil-tight deck with double sides, as potentially equally effective as double hulls. *Id.* at xxii-xxiii. Nevertheless, the report cautioned that "there are no generally accepted criteria for evaluating the equivalency of two [different vessel construction] designs." *Id.* at xxi.

300. Oil Pollution Act of 1990 § 4115(a), 104 Stat. at 518 (codified at 46 U.S.C.A. § 3703a(b)(1)-(2) (West Supp. 1991)).

301. See Deepwater Port Act of 1974, Pub. L. No. 93-627, 88 Stat. 2126 (codified as amended at 33 U.S.C.A. §§ 1501-1524 (West 1986 & Supp. 1991)).

302. See 46 U.S.C. § 3715(b)(5) (1988) (lightering locations and activities).

303. Oil Pollution Act of 1990 § 4115(a), 104 Stat. at 518 (codified at 46 U.S.C.A. § 3703a(b)(3) (West Supp. 1991)).

304. H.R. CONF. REP. NO. 653, 101st Cong., 2d. Sess. 101, 139 (1990), *reprinted in* 1990 U.S.C.C.A.N. 779, 818.

305. Deepwater Port Act of 1974, 88 Stat. at 2126.

306. See *Deep Water Ports: Energy Demands Versus Environmental Safeguards*, [1973] 3 *Envtl. L. Rep.* (Envtl. L. Inst.) 10,165 (Nov. 1973). For the CEQ study, see 119 CONG. REC. 25,591-95 (1973) (statement of Russell E. Train, Chairman, Council on Environmental Quality).

supertankers."<sup>307</sup> Thus, the support for exempting tankers operating at deepwater ports from having double hulls was taken from a study which assumed such tankers *would be double-hulled*.

The exemption for delivering<sup>308</sup> vessels engaged in lightering activities more than sixty miles off shore seems to be based on the Secretary's "broad discretion to determine whether the establishment of any lightering zone is required and to impose by regulation requirements on lightering activities within the zones to protect the marine environment" following drafting of an environmental impact statement and public comment.<sup>309</sup> One potential problem with the exception is that if shippers seek to avoid the new rules by lightering more than sixty miles offshore, the risk of oil pollution could be increased since oil will then be increasingly transferred from one vessel to another in the rougher seas of the open ocean.

The exemption is narrowed somewhat by the addition of section 3715(a)(5). That section provides that if a vessel has received oil from another vessel at a lightering location within the Exclusive Economic Zone,<sup>310</sup> the receiving vessel cannot deliver its cargo to a place subject to the jurisdiction of the U.S. unless *both* vessels in the lightering operation comply with the double hull requirements laid out in OPA section 4115(a).<sup>311</sup>

Finally, the Act specifies different phaseout schedules for vessels, depending upon age and gross tonnage.<sup>312</sup> The final result of this "complicated compromise"<sup>313</sup> is as follows. First, all new<sup>314</sup> tank vessels are required to be built with double hulls subject to the exemptions discussed

307. *Deep Water Ports: Energy Demands Versus Environmental Safeguards*, *supra* note 306, at 10,166.

308. The *receiving* vessel, which would then unload the oil at a U.S. port, *would* be subject to the double-hull rules because it would be "operating on the waters subject to the jurisdiction of the United States" pursuant to the Oil Pollution Act of 1990 § 4115(a), 104 Stat. at 518 (codified at 46 U.S.C.A. § 3703a(a)(2) (West Supp. 1991)).

309. H.R. CONF. REP. NO. 653, at 141, *reprinted in* 1990 U.S.C.C.A.N. at 818-19.

310. *See supra* note 296.

311. Oil Pollution Act of 1990 § 4115(a), (d), 104 Stat. at 518, 520 (codified at 46 U.S.C.A. §§ 3703a(a)(2), 3715(a)(5) (West Supp. 1991)). Section 3715(a)(5) now reads:

(a) A vessel may transfer oil . . . in a port or place subject to the jurisdiction of the United States, when the cargo has been transferred from another vessel . . . in the marine environment, only if . . . (5) the delivering and the receiving vessel are operating in compliance with section 3703a of this title.

*See also* H.R. CONF. REP. NO. 653 at 141, *reprinted in* 1990 U.S.C.C.A.N. at 820.

312. The three size categories for purposes of the phaseout schedules are: 5000 to 15,000 gross tons; 15,000 to 30,000; and 30,000 and over. Oil Pollution Act of 1990 § 4115(a), 484 Stat. at 518 (codified at U.S.C.A. § 3703a(a)-(c) (West Supp. 1991)).

313. Russel V. Randle, *The Oil Pollution Act of 1990: Its Provisions, Intent, and Effects*, 21 *Envtl. L. Rep.* (Envtl. L. Inst.) 10,119, 10,132 (Mar. 1991).

314. For purposes of the OPA, new vessels include all those contracted for *after* June 30, 1990. Oil Pollution Act of 1990 § 4115(a), 484 Stat. at 518 (codified at 46 U.S.C.A. § 3703a(c)(3) (West Supp. 1991)).

above.<sup>315</sup> Single-skin tankers contracted for before June 30, 1990 and delivered before January 1, 1994 will be phased out beginning in 1995. By 2010, all vessels over 5000 gross tons may no longer operate without double hulls, and until 2015, all such vessels must comply with any "other structural and operational requirements that the Secretary determines [in a future rulemaking] will provide as substantial protection to the environment as is economically and technologically feasible."<sup>316</sup> By 2015, all vessels under 5000 gross tons must be equipped with double hulls or the equivalent.<sup>317</sup> Vessels engaged in lightering activities or deliveries to deepwater ports must also comply with the new standards after 2015.<sup>318</sup> The compromise produced in the Conference Committee thus provided a much longer phaseout schedule than the House had wanted, and it included more exemptions.

The study to examine effective alternative designs, advocated by the Senate (and many industry representatives),<sup>319</sup> was retained and recently published.<sup>320</sup> That report concluded that once the double-hull requirements imposed by OPA are fully implemented (over the next twenty-five years), in the absence of other measures, 3000 to 5000 tons of oil spillage should be prevented annually. The added "transport cost" will reach approximately \$712 million per year<sup>321</sup> or one cent per gallon. "On the basis of cost-effectiveness, the double hull is among the best values of the designs evaluated by the committee."<sup>322</sup>

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315. *Id.*, 484 Stat. at 518 (codified as amended at 46 U.S.C.A. § 3703a(b) (West Supp. 1991)).

316. *Id.* § 4115(b) (codified at 46 U.S.C.A. § 3703a(c)(4)(A) (West Supp. 1991)).

317. *Id.* (codified at 46 U.S.C.A. § 3703a(c)(2) (West Supp. 1991)); Randle, *supra* note 313, at 10,132.

318. *Id.* § 4115(a) (codified at 46 U.S.C.A. § 3703a(b)(3) (West Supp. 1991)).

319. "The merits of full application of ballast sides, reduced tank size and double bottom construction should be carefully studied by the National Academy of Sciences or another independent body." *Three Recent Oil Spills: Hearings Before the Subcomm. on Environmental Protection of the Senate Comm. on Environment and Public Works*, 101st Cong., 1st Sess. 42 (1989) (statement of Edwin Roland, President, Amoco Transport Co., appearing on behalf of the American Petroleum Institute).

320. NRC STUDY, *supra* note 12.

321. *See infra* tbl. 4.

322. NRC STUDY, *supra* note 12, at xx.

TABLE 4  
INCREMENTAL TRANSPORT COST FOR DESIGN ALTERNATIVES<sup>323</sup>

Design alternative	Incremental Cost, millions/year
MARPOL Ship	\$ 0
Double Bottom	462
Double Sides	339
Double Hull	712
MARPOL w/Hydro	1080
Small Tanks	430
IOTD w/DS	872
DS w/Hydro	1102
DH w/Hydro	2047

### C. *In the Wake of the OPA*

Following passage of the OPA, the Coast Guard proposed a number of rules designed to carry out its various requirements. On December 5, 1990, the Coast Guard issued proposed rules to implement the critical double-hull provision.<sup>324</sup> Since "double hull" is not defined by the OPA, the Coast Guard proceeded to determine the dimensions of protective spaces that would constitute a double hull.<sup>325</sup> Thus, the proposed rules set standards for determining the proper placement and dimensions of the required void spaces according to the size of the vessel.<sup>326</sup>

On September 6, 1991, the Coast Guard reopened the comment period, originally slated to terminate April 1, 1991, for these proposed rules. The Coast Guard justified its decision on the grounds that two developments which could have a substantial impact on the substance of the final rules had occurred since the earlier comment period had closed. First, the National Academy of Sciences had released its long-awaited, comprehensive study of alternative vessel designs.<sup>327</sup> That study would likely play a large role in determining the final double-hull and other rules.

Second, on July 5, 1991, the Marine Protection Committee of IMO approved new regulations amending Annex I of MARPOL<sup>328</sup> to provide

323. Source: *Id.* at 171, tbl. 6-6.

324. 55 Fed. Reg. 49,006 (1990) (proposed Dec. 5, 1990).

325. *Id.* at 50,197 (proposed Dec. 5, 1990).

326. *Id.* at 50,197 (to be codified at 33 C.F.R. pt. 157, § 10d(b)).

327. NRC STUDY, *supra* note 12.

328. Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, Feb. 17, 1978, 17 I.L.M. 546 (entered into force Oct. 2, 1983) (amended Sept. 7, 1984, Dec. 5, 1985, Dec. 1, 1987).

for an international double-hull construction standard.<sup>329</sup> The Coast Guard solicited comments on the MARPOL amendment, but noted that any MARPOL requirements that were inconsistent with the OPA would not be considered for inclusion in the final rule.<sup>330</sup>

Finally, on November 1, 1991, an Advanced Notice of Proposed Rulemaking was issued, inviting public comments on what structural and operational measures should be adopted to best prevent oil spills during the statutory phaseout period embodied in the OPA's double-hull provisions.<sup>331</sup> Based on the NRC study, the Coast Guard declared its intent to consider such structural measures as double sides, double bottoms, protectively located SBT's, resilient membranes, intermediate decks, and smaller cargo tanks.<sup>332</sup> Operational measures to be considered for possible adoption during the phaseout period include maintenance and inspection, navigation equipment, training, traffic control systems, and other personnel and ship management policies.<sup>333</sup>

#### CONCLUSIONS

Over the past quarter-century, a simple and predictable pattern has emerged. First, a supertanker disaster, or series of disasters, leads political and administrative bodies and the public to demand more pollution-preventive oil tankers. While some standards are tightened, the employment of a relatively simple, effective, and cost-efficient technology is steadfastly resisted by all three branches of government as well as the international maritime community. New studies of the problem are launched, giving the impression that the issue is being addressed, and the spotlight moves on to other, more pressing concerns. Inevitably, in time, another supertanker disaster once again jolts the public and policymakers, sparking a new round of oil spill prevention debates.

In light of this history, and the fact that comprehensive oil spill legislation was unsuccessfully proposed in virtually every Congress throughout this period, why was passage of the Oil Pollution Act of 1990 successful? Despite the clear definition of the problem, the availability of a relatively simple technology to address the problem, and the involvement of a broad array of institutions—political, industrial, and legal—nothing was accomplished in nearly twenty-five years. No doubt the complexity inherent in each of these institutions provides part of the explanation. However, examination of administrative, industrial, and legis-

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329. 56 Fed. Reg. 44,051 (1991). Regulation 13-F (MEPC 31/WP.11, annex 2) sets international standards for new double-hull tankers, and Regulation 13-G (MEPC 31/WP.11, annex 3, para. 2) deals with existing double-hull tankers. *Id.* at 44,051-53.

330. *Id.* at 44,052.

331. *Id.* at 56,284 (implementing § 4115(b) of the Oil Pollution Act of 1990).

332. *Id.* at 56,285.

333. *Id.* at 56,286.

lative psychology and behavior is clearly beyond the scope of this comment.

Yet, an intriguing question remains: what factor or factors provided the critical impetus for discarding the pattern of failed attempts at greater environmental protection described above? A number of plausible explanations exist. In all of these, fate certainly played a large and perhaps decisive role. First, two supertanker accidents, the *Valdez* in Alaska and the *American Trader* off the coast of Southern California, occurred within a very short period of time. The massive publicity and outcry attending the *Valdez* spill was given new urgency and credibility when the *American Trader* dumped its load just offshore of a popular beach in a heavily populated urban center. It was also mere coincidence that the congressional representative for the district affected by the spill was the powerful chairman of a key House committee involved in considering the merits of one of the bills, which later became the Oil Pollution Act of 1990.

Another potential factor in OPA's success is equally unrelated to the efforts of industry or administrative or political bodies dealing with the double-hull issue. Coming twenty years after the first Earth Day, the bill's success may reflect a deeper change in societal attitudes. Perhaps people collectively are now unwilling to tolerate the mass environmental destruction that such modern inventions as supertankers can bring. Clearly, the recent print advertisements hailing the benefits of double hulls by showing seals and whales in apparent celebration of the newly adopted technology seem directed at such sensibilities.

A third explanation, as fortuitous as the others, may be the unprecedented media coverage of the accident and the cleanup in Prince William Sound. Until the *Valdez*, two powerful industries, oil and shipping, both international in scope, were overwhelmingly opposed to any legislatively mandated double-hull requirement. After the *Exxon Valdez* accident, glaring deficiencies in disaster response and oil spill cleanup capabilities were electronically broadcast around the globe, highlighting the utter failure of the elaborate and reassuring contingency plans drawn up by Alyeska and approved by the State of Alaska.

It is likely that no other environmental disaster has ever received such extensive media coverage as did the *Valdez* accident. The stark pictures of pristine wilderness fouled with miles of thick black oil, and dead and dying animals of all kinds, had an enormous impact on the public perception of the real toll such accidents extract. Legislators may have been emboldened to act in that fleeting instant in which the political strength and credibility of the powerful oil and shipping industries were compromised and public outcry was greatest. One legislator has suggested that new internal conflicts appearing within the industry over the



efficacy of double hulls may have created further cleavages allowing passage of the OPA.<sup>334</sup>

Such answers, if correct, do not bode well for the future resolution of other serious issues of public policy, especially those requiring solutions more complex and innovative than double hulls. In other areas of environmental regulation, the problems are frequently far more complex, and the technologies available to remedy them are either inadequate or nonexistent. Further, most often, a large number of diverse industrial and other groups have a great interest in the formulation of environmental regulations.

By contrast, here the problem was well defined: how to prevent oil contained within a ship from entering the marine environment. Likewise, the proposed solution was neither new nor technologically complex: provide an extra layer of containment around the cargo to protect against the inevitable grounding or collision accident. Finally, the number of different industry groups was relatively small. Only the shipping and oil interests had a real stake in the outcome.

Yet, no solution was reached for almost a quarter of a century until a number of disparate events serendipitously coalesced and impelled policymakers to act. As a society, we possessed both the knowledge and the technical means to improve marine safety and to protect the environment. What we lacked were political, economic, administrative, and legal institutions which were willing and able to put that knowledge to work.

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334. *Hearing Before the Subcomm. on Transportation, Aviation and Materials of the House Comm. on Science, Space, and Technology*, 101st Cong., 2d Sess. 1 (1990) (remarks of Rep. Robert Torricelli, Chairman).

