



Fall 2007

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**Recommended Citation**

Inho Kim, *'Milking' Oil Tankers: The Paradoxical Effect of the Oil Pollution Act of 1990*, 47 NAT. RES. J. 849 (2007).

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# “Milking” Oil Tankers: The Paradoxical Effect of the Oil Pollution Act of 1990

*In response to the Exxon Valdez incident, the Oil Pollution Act of 1990 was enacted as allegedly comprehensive oil pollution legislation. The Act enforces double-hull requirements for tank vessels in U.S. waters, except designated lightering zones or deepwater offshore oil ports, until 2015. The requirements are efficient in preventing oil spills but suffer from cost ineffectiveness because of the large expenditures associated with them. In response to the increase in capital and operating costs, the shipping industry has changed its operation patterns to take advantage of cost-efficient older single-hull tankers in U.S. waters. In particular, the retirement deadlines of single-hull vessels under the Act have had the paradoxical effect of encouraging tanker owners to “milk” their vessels up to the end of their legal economic lives. The Act has led to an unexpected and undesirable situation in controlling oil pollution risks, which calls for taking appropriate measures to ensure the adequate operation of the older single-hull vessels.*

## I. INTRODUCTION

In response to the *Exxon Valdez* oil spill,<sup>1</sup> the Oil Pollution Act of 1990<sup>2</sup> (OPA 90) was signed into law on August 18, 1990 as allegedly comprehensive oil pollution legislation addressing the issues of oil pollution cleanup, response, compensation, liability, and prevention.<sup>3</sup> OPA 90 uses direct regulation as well as liability to control oil pollution risks associated with marine oil transportation.<sup>4</sup> OPA 90 increases liability limits for the shipping sector in the oil supply chain, rendering the liability of such

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1. On March 24, 1989, the *Exxon Valdez* ran aground on Bligh Reef in Prince William Sound, Alaska, spilling approximately 240,500 barrels of crude oil into the Sound. The oil covered approximately 1,100 miles of non-continuous coastline. See HAZARDOUS MATERIALS RESPONSE & ASSESSMENT DIV., NAT’L OCEANIC & ATMOSPHERIC ADMIN., OIL SPILL CASE HISTORIES 1967-1991, at 80-86 (1992), available at [http://response.restoration.noaa.gov/bookshelf/26\\_spilldb.pdf](http://response.restoration.noaa.gov/bookshelf/26_spilldb.pdf); ENERGY INFO. ADMIN., PETROLEUM: AN ENERGY PROFILE 1999, at 38 (1999), available at [http://www.eia.doe.gov/pub/oil\\_gas/petroleum/analysis\\_publications/petroleum\\_profile\\_1999/profile99v8.pdf](http://www.eia.doe.gov/pub/oil_gas/petroleum/analysis_publications/petroleum_profile_1999/profile99v8.pdf).

2. See Oil Pollution Act of 1990, Pub. L. No. 101-380, 104 Stat. 484 (codified as amended in scattered sections of 33 U.S.C., 26 U.S.C., 46 U.S.C., 14 U.S.C.) [hereinafter OPA 1990].

3. *Id.*

4. *Id.*

enterprises unlimited in most cases.<sup>5</sup> OPA 90 also provides numerous tanker safety and pollution prevention regulations, including the double-hull requirements for tank vessels.<sup>6</sup> Under OPA 90, the shipping sector is faced with the risk of unlimited liability and the certainty of increased capital and operating costs.

By channeling substantially unlimited liability to the shipping sector, and none to the cargo sector, OPA 90 motivated most major oil companies to contract out the risky activity of oil shipping to independent operators. OPA 90 also undermined oil companies' incentives to charter safer but more expensive tankers from the shipping sector. As a result, the policy of the oil companies generated derivative disincentive in the shipping sector. The shipping sector has not entirely withdrawn from U.S. waters, but rather changed its operation patterns to take advantage of cost-efficient older single-hull vessels in those waters. In particular, the retirement deadlines of single-hull vessels under OPA 90 have created this paradoxical effect.

This article first reviews and analyzes the double-hull requirements in OPA 90, followed by an examination of their cost effectiveness. This article then examines the effect of the double-hull requirements and the retirement deadlines of single-hull vessels under OPA 90.

## II. DOUBLE-HULL REQUIREMENTS

### A. Implementation

OPA 90 requires new tank vessels operating in U.S. waters to be constructed with double hulls and the existing single-hull or double-bottom or double-side vessels to be phased out under a timetable based on the tank vessel's age and tonnage, beginning in 1995 and running through 2015 (see Table 1). OPA 90 requires compliance from vessels engaged in oil trade in U.S. waters irrespective of their country of registry. Single-hull vessels of at least 5,000 gross tons are excluded from U.S. waters beyond 2010 (see Appendix). Double-hull requirements do not apply to vessels operating at low risk areas, deepwater ports, or designated offshore lightering<sup>7</sup> areas until 2015.<sup>8</sup> OPA 90 and its international counterpart MARPOL 73/78

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5. *Id.*

6. *Id.*

7. Lightering is defined as the process of transferring petroleum cargo, excluding bunkers, from the ship to be lightered to the service (or receiving) vessel for the purpose of enabling tankers, large or with a deep draft, to enter the harbor or approach the terminal where the cargo is to be delivered. See MARINE BD., COMM. ON OIL SPILL RISKS FROM TANK VESSEL LIGHTERING & NAT'L RESEARCH COUNCIL, COMM'N. ON ENG'G & TECHNICAL SYS., OIL SPILL RISKS FROM TANK VESSEL LIGHTERING 12-13 (1998).

8. See Carriage of Liquid Bulk Dangerous Cargoes, 46 U.S.C. § 3703a (2006).

regulations I/13G<sup>9</sup> limit the operating life of single-hull vessels by setting a retirement date up to which the vessels are allowed to operate in U.S. waters and in international waters respectively. However, it would be possible that an oil tanker is allowed to trade in one of the waters, but not in the other, because the phasing-out schedules differ (see Table 2).

**Table 1: Requirements of OPA for New Vessels and Existing Vessels<sup>10</sup>**

Size	NEW VESSELS		EXISTING VESSELS		
	< 5,000 GT	≥ 5,000 GT	< 5,000 GT	≥ 5,000 GT	
Hull requirements	double-hull or double-containment systems <sup>a</sup>	double hull	double-hull or double-containment systems	double hull	operational measures
Enforcement date	<ul style="list-style-type: none"> <li>contracted after June 30, 1990</li> <li>delivered after Jan. 1, 1994</li> </ul>		after Jan. 1, 2015	Per schedule starting in 1995	Nov. 27, 1996

**a: No double-containment system has been approved by the Secretary of Transportation.**

**Table 2: Phasing-out Schedule of MARPOL 13G for Existing Vessels<sup>11</sup>**

Category	Category 1 (pre-MARPOL tankers)	Category 2 (MARPOL tankers)	Category 3 (small tankers)
Size	crude carriers ≥ 20,000 DWT and product carriers ≥ 30,000 DWT		5,000 DWT ≤ crude carriers < 20,000 DWT and 5,000 DWT ≤ product carriers < 30,000 DWT
Enforcement date	April 5, 2005 for ships delivered on April 5, 1982 or earlier	<ul style="list-style-type: none"> <li>April 5, 2005 for ships delivered on April 5, 1977 or earlier</li> <li>2005 for ships delivered after April 5, 1977 but before Jan. 1, 1978</li> <li>2006 for ships delivered in 1978 and 1979</li> <li>2007 for ships delivered in 1980 and 1981</li> <li>2008 for ships delivered in 1982</li> <li>2009 for ships delivered in 1983</li> <li>2010 for ships delivered in 1984 or later</li> </ul>	

9. See International Convention for the Prevention of Pollution from Ships, Nov. 2, 1973, 1340 U.N.T.S. 184, *reprinted in* 12 I.L.M. 1319, *amended by* Protocol, Feb. 17, 1978, 34 U.S.T. 3407, 1340 U.N.T.S. 61, *reprinted in* 17 I.L.M. 546 (regulation amended on Mar. 6, 1992) [hereinafter MARPOL].

10. See MARINE BD., COMM. ON OIL POLLUTION ACT OF 1990 (SECTION 4115) IMPLEMENTATION REV. & NAT'L RESEARCH COUNCIL, COMM'N ON ENG'G & TECHNICAL SYS., DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT OF THE OIL POLLUTION ACT OF 1990 (1998) [hereinafter DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT].

11. MARPOL, *supra* note 9, at 13(G)(4); see generally International Maritime Organization, <http://www.imo.org> (follow "site index" hyperlink located at bottom of webpage, then follow "MARPOL" hyperlink) (providing a detailed summary of the amendments).

OPA 90 sets requirements for the interim structural and operational measures for tank vessels of 5,000 gross tons or more without double hulls until 2015.<sup>12</sup> Charged with enforcing the statute, the U.S. Coast Guard accordingly has implemented a three-phased scheme to reduce oil pollution from existing single-hull tank vessels. As the first phase, the Coast Guard published on August 5, 1994 a rule requiring the owners or operators of tank vessels of 5,000 gross tons or more without double hulls to carry emergency lightering equipment on board.<sup>13</sup> The principal benefit of this regulation is to ensure rapid oil transfer from a stricken tank vessel to another, minimizing the risk of further spillage. The regulation addresses ex post spill actions rather than prevention or reduction of oil spills. As a result of this final rule, early vessel retirements are not anticipated.<sup>14</sup>

The second phase was a final rule issued on July 30, 1996 requiring operational measures such as an under-keel clearance requirement, maneuvering performance capability tests, and an enhanced survey program.<sup>15</sup> This rule focuses on reducing the risk of groundings, collisions, or fires.<sup>16</sup> The minimum under-keel clearance is designed to reduce oil spills as a result of groundings during transit to and from port. The owner, master, or operator of a tank vessel of 5,000 gross tons or more is required to calculate the vessel's anticipated under-keel clearance prior to entering or leaving port. A tank vessel is not allowed to proceed with an anticipated under-keel clearance of less than 0.5 meters (two feet), or without the express permission of the Captain of the Port designated by the Coast Guard. The under-keel clearance requirement would incur a loss in cargo carrying capacity because vessels are forced to carry less cargo, lighter before entering port, or offload cargo prior to departing (see Table 1).<sup>17</sup>

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12. DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 23.

13. Emergency Lightering Equipment and Advanced Notice of Arrival Requirements for Existing Tank Vessels Without Double Hulls, 59 Fed. Reg. 40,186 (Aug. 5, 1994) (codified at 33 C.F.R. §§ 157, 160 (2007)).

14. *See id.* at 40,188.

15. *See* Operational Measures to Reduce Oil Spills from Existing Tank Vessels Without Double Hulls, 61 Fed. Reg. 39,770 (July 30, 1996). The provision regarding the under-keel clearance requirement was suspended and revised. The final rule revising the provision was effective January 21, 1998. *See* Operational Measures to Reduce Oil Spills from Existing Tank Vessels Without Double Hulls, 61 Fed. Reg. 64,618 (Dec. 6, 1996) (codified at 33 C.F.R. § 157 (2007), 46 C.F.R. §§ 31, 35 (2006)) (notice of partial suspension of regulation); Operational Measures to Reduce Oil Spills from Existing Tank Vessels Without Double Hulls, 62 Fed. Reg. 49,603 (Sept. 23, 1997) (codified at 33 C.F.R. § 157 (2007)).

16. *See* Structural Measures to Reduce Oil Spills from Existing Tank Vessels Without Double Hulls, 62 Fed. Reg. 1622 (Jan. 10, 1997) (codified at 33 C.F.R. § 157 (2007)).

17. Operational Measures to Reduce Oil Spills from Existing Tank Vessels Without Double Hulls, 60 Fed. Reg. 55,904, 55,918, 55,923-24, 55,930 (Nov. 3, 1995) (codified at 33 C.F.R. § 157 (2007), 46 C.F.R. §§ 31, 35 (2006)); Operational Measures to Reduce Oil Spills from

The final phase was to require structural measures. Issued on January 10, 1997, the final rule does not, however, require structural measures because the Coast Guard determined that these interim structural measures are not feasible for existing tank vessels without double hulls. The Coast Guard determined that, while protectively located void spaces (PL/Spaces)<sup>18</sup> are technologically feasible, they are economically infeasible for pre-MARPOL tank vessels. The Coast Guard also determined that hydrostatically balanced loading<sup>19</sup> is technically feasible for single-hull tank vessels but is difficult for vessels carrying heterogeneous cargoes and engaged in multi-port voyages.<sup>20</sup> In the end, the rule does not require structural modifications of single-hull vessels before they are phased out.

### B. Cost Effectiveness

The double-hull tanker has an inner hull, separated from the outer by approximately ten feet. Over the past decade, "collisions and groundings have been responsible for approximately 70 percent of the oil spillage from" tank vessels.<sup>21</sup> In the case of a collision or grounding, double-hull tankers are four to six times less likely than single-hull tankers to spill oil.<sup>22</sup> "Average outflow is three to four times less with a double-hull compared to a single-hull tank vessel."<sup>23</sup> If the current fleet predominantly comprising single-hull vessels were all replaced with double-hull vessels, it is projected that the double-hull requirements would eliminate "four out of every five oil spills" and realize a "two-thirds reduction...in the total volume of oil spill[s] [attributable] to collisions and groundings."<sup>24</sup> Therefore, the

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Existing Tank Vessels Without Double Hulls, 61 Fed. Reg. at 39,791; Kevin E. Lunday & Stephen J. Darmody, *Using Financial Markets to Protect the Environment: U.S. Coast Guard Leads Modern Approach*, 10 U.S.F. MAR. L.J. 173, 182-85 (1998).

18. A "PL/space includes any tank or void space that is not used for the carriage of cargo, cargo residue, slops, dirty ballast or fuel oil." Structural Measures to Reduce Oil Spills from Existing Tank Vessels Without Double Hulls, 60 Fed. Reg. 67,226-28 (Dec. 28, 1995) (codified at 33 C.F.R. § 157 (2007)). "Protectively located" refers to the "distribution of these spaces along the length of the vessel's hull." *Id.*

19. Hydrostatically balanced loading means limiting the level of oil cargo to ensure that the hydrostatic pressure exerted outward by the oil at the tank (and ship) bottom is lower than the external pressure exerted inward by the seawater. If the tank is breached, seawater will flow in rather than oil flowing out. Steven L. Crookshank, American Petroleum Institute, *Modifying Single-Hull Tankers: Costs and Benefits* (Mar. 1998); DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 266.

20. See Structural Measures to Reduce Oil Spills from Existing Tank Vessels Without Double Hulls, 62 Fed. Reg. at 1622-23, 1626, 1636.

21. DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 24.

22. *Id.* at 139.

23. *Id.*

24. *Id.* at 24.

requirements would have a positive effect on reducing the risk and the severity of oil spills.<sup>25</sup>

However, critics claim that double-hull requirements were introduced due to political pressure from the public and environmental organizations just after the *Exxon Valdez* oil spill. These critics contend that double-hull tankers may not be able to contain oil in the case of high-energy collisions and are also likely to be more susceptible to fires and explosions because of accumulation of volatile gases between the two hulls of the tank vessels.<sup>26</sup> Furthermore, double-hull tank vessels suffer cost disadvantages in comparison with single-hull tankers: "The increase in cost per [deadweight ton] for double-hull [tankers] is estimated at between 9 and 17 percent."<sup>27</sup> Clear differences in the operating costs between double-hull and single-hull tankers are found in maintenance and repair (M&R) costs and hull and machinery (H&M) insurance premiums.<sup>28</sup> The M&R "costs for double-hull tankers [are higher than] those for single-hull tankers by 11 to 37 percent, depending on vessel type."<sup>29</sup> The costs of marine H&M insurance per gross ton for a double-hull Very Large Crude Carrier (VLCC) or Aframax tanker are approximately six percent higher than for a single-hull counterpart, a result of the higher purchase cost of a double-hull tanker.

Furthermore, discounts granted in protection and indemnity (P&I)<sup>30</sup> premiums for "double-hull tankers [from] 1992 to 1995 were terminated in February 1996....Increases in total insurance costs for [double-hull tankers are] 1 percent for VLCCs, 3 percent for Suezmax tankers, and 4 percent for Aframax tankers."<sup>31</sup> Total insurance premiums for a double-hull tanker are higher than for a single-hull tanker of the same size because any reduction in the P&I premiums are offset by higher H&M premiums.<sup>32</sup> The increase in total operating costs attributable to double-hull tankers is estimated at 5 to 13 percent.

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25. *Id.* at 24, 139.

26. See Richard L. Jarashow, *Survey of State Legislation*, 5 U.S.F. MAR. L.J. 447, 450 (1993).

27. DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 88.

28. *See id.*

29. *Id.* at 89.

30. P&I Clubs are associations of shipowners, charterers, ship operators, and managers who have agreed to insure each other's ships on a mutual and non-profit basis. See SIMON POLAND & TONY ROTH, *GARD HANDBOOK ON P&I INSURANCE* 104-07 (1996); see also STEVEN J. HAZELWOOD, *P&I CLUBS LAW AND PRACTICE* 282-83 (2d ed. 1994). As a condition of coverage, a member must settle the liability claim against him before indemnification from his P&I Club. See POLAND & ROTH, *supra*; HAZELWOOD, *supra*.

31. DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 90.

32. See PETROLEUM INDUS. RESEARCH FOUND., INC., *TRANSPORTING U.S. OIL IMPORTS: THE IMPACT OF OIL SPILL LEGISLATION ON THE TANKER MARKET* (prepared for the U.S. Department of Energy) 92-93 (1992) [hereinafter PETROLEUM INDUS.].

The increase in oil prices due to double-hull requirements compared with the increase in oil price through insurance cost due to intensified liability may implicate the relative cost-inefficiency of double-hull requirements in controlling oil pollution risks.<sup>33</sup> In fact, one study done by the U.S. Coast Guard shows that double-hull requirements resulted in significant costs but moderate benefits.<sup>34</sup>

### III. THE EFFECTS OF THE DOUBLE-HULL REQUIREMENT

#### A. Factors Failing to Generate Proper Incentives in the Oil Supply Chain Under OPA 90

The tank vessel industry serves the oil industry as a link in the oil supply chain. Tank vessels are employed exclusively for oil transportation – an industry that is prone to competition. In comparison, the oil cargo sector is relatively limited in number. Major oil companies still dominate the oil supply chain, particularly in U.S. waters, even though their influence has declined. Therefore, the oil industry could exercise control over the tanker industry by its economic leverage. This implies that the oil cargo sector could indirectly exercise control over oil pollution risks – and is an operative decision maker with respect to risks, along with the shipping sector. If the oil cargo sector made selective use of sound oil tankers, this would make oil tankers carefully transport oil to survive in the competitive shipping market. Still, the oil cargo sector would need incentive to do so.

OPA 90 channels liability to the shipping sector without oil cargo liability. Oil companies currently bear little financial liability for oil pollution if they are not involved in the ownership of tank vessels. This fails to generate incentives in the oil cargo sector. In turn, disincentives in the oil cargo sector undermine incentives in the shipping sector because of the relationship between the two sectors in the supply chain.

#### B. The Effect on the Oil Cargo Sector

By channeling substantially unlimited liability to the shipping sector without holding the oil cargo sector liable, OPA 90 limits the oil companies' exposure to and liability for oil pollution risks. This has brought

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33. Double-hull requirements are estimated to cost \$6,408,692,040 (compliance and enforcement costs [\$6,413,027,637] – avoided costs [\$4,335,597]) from 1996 through 2025. Financial responsibility rules cut down total costs by \$161,298,722 (compliance and enforcement costs [\$451,440,918] – avoided costs [\$612,739,640]) during the same period. See U.S. COAST GUARD, OPA 90 PROGRAMMATIC REGULATORY ASSESSMENT (PRA) 9-6 (2001) (on file with Natural Resources Journal).

34. *Id.* at 8-7.



about the retreat of oil companies from the tanker business and thus undermined incentives for oil companies to replace the aging tanker fleets with new and safer ships, opting for charters instead. Secondly, this has also undermined incentives to charter safer, but more expensive, tankers from responsible shipping companies that have good safety records.<sup>35</sup>

### 1. Tank Vessel Ownership by the Oil Industry

#### a. Evasion of Ownership in General

OPA 90 holds shipowners, operators, or bareboat charterers<sup>36</sup> liable as responsible parties—not oil cargo owners.<sup>37</sup> The oil cargo owner who charters the ship on a time or voyage basis does not become an operator because the time or voyage charterer does not have technical control of the ship and thus is not liable under OPA 90.<sup>38</sup> If oil companies chose to dispose of all their tank vessels and time or voyage charter in tonnage, they would not be at risk under OPA 90.<sup>39</sup>

The majority of companies withdrew or reduced their fleets in U.S. waters after OPA 90.<sup>40</sup> Oil company-owned vessel tonnage trading to the United States dropped from "74.3 million deadweight tons [DWT] in 1990 to 66.4 million deadweight tons in 1994."<sup>41</sup> The policies of some oil companies exemplified the mainstream of industry responses to enhanced environmental regulation under OPA 90. On June 11, 1990, Shell announced

35. See *Certificates of Financial Responsibility Under the Oil Pollution Act: Hearing Before the Subcomm. on Coast Guard and Navigation of the House Comm. on Merchant Marine and Fisheries*, 102nd Cong. 149 (1991) (statement of the International Association of Independent Tanker Owners); 135 CONG. REC. H8,158 (daily ed. Nov. 8, 1989) (statement of Rep. Hammerschmidt); *Oil Pollution Liability and Compensation Act: Hearing and Markup on Title III of H.R. 1465 Before the Subcomm. on Human Rights and International Organizations of the House Comm. on Foreign Affairs*, 101st Cong. 86 (1989) (statement of the International Association of Independent Tanker Owners); ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION LAW, SCIENCE, AND POLICY 143 (2d ed. 1996); DREWRY SHIPPING CONSULTANTS, THE INTERNATIONAL OIL TANKER MARKET: SUPPLY, DEMAND AND PROFITABILITY TO 2000, at 80 (1994).

36. There are three types of charter. Under demise (or bareboat) charter, the vessel is let bare, i.e., without officers and crew. The possession of the vessel is transferred to the charterer. The common denominator of the other two forms is the non-transfer of possession of the vessel to the charterer and no operational control of the charterer over the vessel. Under time (or period) charter, the owner provides the vessel, officers, and crew to the charterer for his discretionary use for a specified period of time. Under voyage (or spot) charter, the vessel transports a specific cargo on a single voyage between nominated loading and discharge ports. See POLAND & ROTH, *supra* note 30, at 90-91; DREWRY SHIPPING CONSULTANTS, THE TANKER CHARTER MARKET—STRUCTURE, PARTICIPANTS AND TRENDS 1 (1992).

37. See 33 U.S.C. § 2701(32) (1999).

38. See 33 C.F.R. § 380.30 (1996).

39. See PETROLEUM INDUS., *supra* note 32, at 65.

40. See DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 83.

41. *Id.* at 61.

that it would use only chartered vessels for the transportation of its oil to the United States except the Louisiana Offshore Oil Port (LOOP),<sup>42</sup> where its own tankers continued to call, due to the risks of unlimited liability under OPA 90.<sup>43</sup> In addition, British Petroleum, Petrofina, and Texaco balked at sending their vessels to U.S. waters.<sup>44</sup> Other oil companies such as Exxon, Fina, Coastal, and Phillips completely disposed of their U.S. trading fleets, chartering vessels for their oil transportation.<sup>45</sup> The policy of oil companies to retreat from tanker ownership between 1990 and 1994 is closely related to the increased liability limits and the potential for unlimited liability with vessel ownership under both OPA 90 and American state laws.<sup>46</sup>

*b. The Baseline Demand for Tank Vessels*

It takes approximately 37 days for a tanker to arrive in the Gulf of Mexico from the Persian Gulf.<sup>47</sup> Spot charters are fixed approximately ten weeks in advance of arrival in the United States, and time charters approximately four months.<sup>48</sup> Therefore, oil companies may have the baseline demand for their own tank vessels to meet immediate requirements for unscheduled transportation required by the production and marketing divisions. Oil companies may also need to retain a minimum of tank vessels to cope with a possible sudden surge in tanker demand in

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42. See Wire Reports, *France's Elf Follows Shell's Lead in Curbing Tanker Calls in US*, J. COMMERCE, June 25, 1990, at 8B; Antonio J. Rodriguez & Paul A.C. Jaffe, *The Oil Pollution Act of 1990*, 15 TUL. MAR. L.J. 1, 25 (1990); LOOP, located approximately 18 miles off the coast of Louisiana, transfers oil to storage facilities in Louisiana through a pipeline. LOOP Program, Louisiana Dept. of Transportation & Dev., [http://www.dotd.louisiana.gov/programs\\_grants/loop/](http://www.dotd.louisiana.gov/programs_grants/loop/) (last visited Oct. 8, 2007).

43. Wire Reports, *supra* note 42, at 8B; Rodriguez & Jaffe, *supra* note 42, at 25; Janet Porter, *Boycott of US Ports May Boost Lightering; Operators See Opportunity*, J. COMMERCE, July 2, 1990, at 8B; OIL & GAS J., July 2, 1990, at 2.

44. See Robin Buckner Price, *U.S. Oil Spill Law to Cause Growing Tanker Problem*, OIL & GAS J., Sept. 30, 1991, at 21; *Solons Reject Tanker Accord; Boycott Grows*, OIL & GAS J., July 9, 1990, at 30; Edwin Unsworth, *More Tanker Owners Are Forecast to Follow Shell's US Port Pullout*, J. COMMERCE, June 14, 1990, at 8B; Rodriguez & Jaffe, *supra* note 42, at 25-27; Paul S. Edelman, *The Oil Pollution Act of 1990*, 8 PACE ENVTL. REV. 1, 22 (1990).

45. DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 61.

46. PERCIVAL ET AL., *supra* note 35, at 130-44; *Tanker Ownership Reflects Fear of Penalties*, OIL & GAS J., Jan. 15, 1996, at 23; DREWRY SHIPPING CONSULTANTS, *supra* note 35, at 69, 76-77.

47. *Vessel Certificates of Financial Responsibility: Hearing Before the Subcomm. on Coast Guard and Navigation of the House Comm. on Merchant Marine and Fisheries*, 103rd Cong. 266 (1994) (Letter of November 2, 1994, to President William J. Clinton from Hon. W.J. Tauzin, Hon. Jack Fields, Hon. Solomon P. Ortiz, Hon. Howard Coble, Hon. Greg Laughlin, and Hon. Herbert H. Bateman).

48. *Id.* at 235 (statement of Jerry A. Aspland, President, Arco Marine, Inc. and Chairman, API General Comm. on Marine Transportation).

the charter market.<sup>49</sup> The major oil companies have largely chosen to delay replacement of their old single-hull vessels for the baseline demand as long as it is economically feasible and allowed by OPA 90 and MARPOL 13G.<sup>50</sup> This reluctance to replace old vessels with double-hull vessels increases the potential oil pollution risks in U.S. waters. At the end of 1992, only five percent of new ship-buildings were on order from oil companies.<sup>51</sup> Tanker order books at the end of 1993 showed that Shell ordered only four tankers, Chevron two tankers, and Conoco two tankers; most orders were placed by independent owners.<sup>52</sup> As a result, while more modern fleets tend to be owned by the independent ship owners, older fleets are owned by the major oil companies (see Appendix).<sup>53</sup> In 2000, the average age of the independent tankers was approximately 13 years and that of tankers owned by oil companies was approximately 16 years (see Table 3).<sup>54</sup> The oil companies have a choice between operating their own old vessels or chartering vessels. This would depend on the trade-off between relative costs and their risk preference, and eventually on their policy or culture.

**Table 3: Age of Tankers by Ownership Category, Feb. 2000<sup>55</sup>**

OWNERSHIP	NO.	M DWT	AVG. AGE	DWT SHARE (%)
Government	594	45.2	16.0	15
Independent	2,791	239.0	13.1	79
Oil Company	167	19.0	16.1	6
Total	3,552	303.2	14.5	100

## 2. Disincentives to Charter Sound Vessels

The decline of oil company tanker ownership has led to an increase in charter activity. The chartered tonnage of the six major oil companies in the dirty spot market<sup>56</sup> increased from 116.3 million deadweight cargo tons

49. See LANE C. KENDALL & JAMES J. BUCKLEY, *THE BUSINESS OF SHIPPING* 379-80 (6th ed. 1994).

50. *U.S. Firms Delay Tanker Replacements*, OIL & GAS J., Nov. 29, 1993, at 31; Jeffery D. Morgan, *The Oil Pollution Act of 1990: A Look at Its Impact on the Oil Industry*, 6 FORDHAM ENVTL. L.J. 1, 18 (1994).

51. *Dangerous Waters*, ENERGY ECONOMIST, Nov. 27, 1992, at 19.

52. DREWRY SHIPPING CONSULTANTS, *supra* note 35, at 113-18.

53. *Id.* at 51.

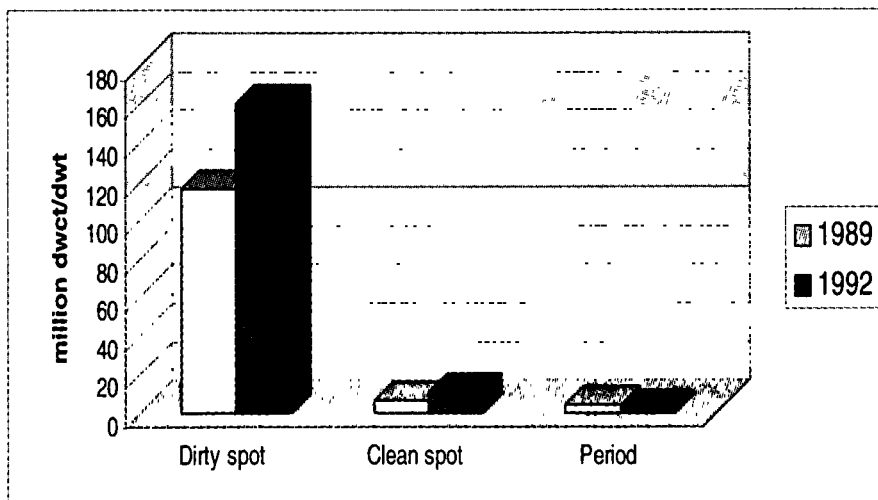
54. INT'L ASS'N OF INDEP. TANKER OWNERS, INTERTANKO FACT SHEET 2000 (Feb. 2000) (on file with Natural Resources Journal).

55. *Id.*

56. "Dirty" refers to cargoes of crude oil and certain heavier refined products, notably fuel oil. DREWRY SHIPPING CONSULTANTS, *supra* note 36, at 1.

in 1989 to 160.8 million deadweight cargo tons in 1992. The chartered tonnage in the clean spot market<sup>57</sup> increased from 6.66 million deadweight cargo tons in 1989 to 11.11 million deadweight cargo tons in 1992. However, the chartered tonnage period market decreased from 4.23 million deadweight tons in 1989 to 2.23 million deadweight tons in 1992. The visible activities of the major oil companies in the dirty spot market reflect the basic pattern of U.S. oil imports; crude oil accounts for the majority of U.S. oil imports. In addition, major oil companies dominate crude oil imports (see Figure 1).<sup>58</sup>

**Figure 1: Changes in Charter Activity by Major Oil Companies, 1989 and 1992 (million dwct/dwt)<sup>59</sup>**



- Major oil companies include British Petroleum, Chevron, Exxon, Mobil, Royal Dutch Shell and Texaco.
- Dirty spot, clean spot: million dwct; period: million dwt.

57. "Clean" refers to cargoes of certain refined products, including gasolines, naphthas, kerosenes, and gas oils. *Id.*

58. DREWRY SHIPPING CONSULTANTS, *supra* note 35, at 70-76.

59. *Id.* at 80.

Major oil companies claimed to promote a safe, modern tanker fleet and to support a two-tier market where quality tonnage was paid a premium. Promises were made to back the shipowners in modernizing an aging tanker fleet. However, major oil companies in practice give their priority to exploration, production, refining, and marketing. Transportation, the necessary evil to oil production and refining, is simply left to the independent tanker owners.<sup>60</sup> The policy of oil companies to charter tonnage obviously conflicts with their announced environmental commitments.<sup>61</sup> Basically, this policy is driven by price, not risk of liability exposure in procuring chartered tonnage, because they are immune from liability.<sup>62</sup> Many oil companies are opting for the cheaper and older vessels on a spot basis. They refuse to pay for quality tonnage, demonstrating a lack of interest in period chartering. In addition to retreating from tanker ownership to evade liability, they fail to compensate for independent tanker owners' assumption of liability by not offering premiums for quality tonnage. The cheap "rust bucket" tanker is favored and sets the freight rate in the spot market. No rate differentiation is made between tankers on the basis of quality. With insignificant period chartering, the chartering policy in the spot market prevails.<sup>63</sup> Even the period market does not offer rewards for double hulls, generally providing rewards for less aged or less superannuated tonnage.<sup>64</sup> As reviewed in the following section, this policy of oil company avoidance has generated derivative disincentives in the shipping sector.

## B. The Effect on the Shipping Sector

Faced with the risk of unlimited liability and increased capital and operating costs under OPA 90, the shipping sector has changed its operation patterns in U.S. waters rather than withdrawing altogether.<sup>65</sup> An increase in both capital and operating costs under OPA 90 has led to an undesirable situation in controlling oil pollution risks. Newer and safer tank vessels cannot get higher freight rates to offset the increases in their capital

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60. *Dangerous Waters*, *supra* note 51; *Tanker Industry Spokesman Warns of Faults in U.S. Oil Pollution Law*, OIL & GAS J., July 27, 1992, at 41 (hereinafter *Tanker Industry Spokesman*).

61. *See Tanker Industry Spokesman*, *supra* note 60.

62. *See Certificates of Financial Responsibility Under the Oil Pollution Act: Hearing Before the Subcomm. on Coast Guard and Navigation of the H. Comm. on Merchant Marine and Fisheries*, 102nd Cong. 159 (1991) (statement of Bjorn Wilhelmsen, Board Member, Senior Shipping Advisor, I.M. Skaugen of Oslo, Norway).

63. *See Dangerous Waters*, *supra* note 51; *Tanker Industry Spokesman*, *supra* note 60; Patrick Crow, *Owners' View of Tankers*, OIL & GAS J., Mar. 8, 1993, at 23; Derek Bamber, *Never Up for Long*, 58 PETROLEUM ECONOMIST 15, 16 (1991).

64. *See PETROLEUM INDUS.*, *supra* note 32, at 94.

65. *See id.* at 66.

and operating costs because the shipping industry is highly competitive. Oil companies rarely acknowledge safety features of vessels and instead favor old and cheap vessels. As a result, the policy of the oil cargo sector undermines the incentives in the shipping sector.

1. *Preference for Low Freight Rates over Vessel Quality for Commercial Survival*

OPA 90 incurs increases in both capital and operating costs. Capital costs are increased due to double-hull construction and financing costs. Extending the lives of existing vessels incurs a more modest, short-term increase. Operating costs are increased through implementation of stricter operational procedures, repair and maintenance programs, more complex contingency planning, and higher insurance costs.<sup>66</sup> The leading factor in an increase in operating costs has been the increases in P&I premiums for tankers trading to the United States.<sup>67</sup> These increased costs would be barely reflected in freight rates, at least in the short term, because freight rates are fundamentally decided by supply and demand (and the rate at which ships are scrapped), even though charterers often assume additional insurance costs incurred for U.S. trade.<sup>68</sup> The shipping industry suffers surplus capacity with many older vessels prepared to offer highly competitive rates. As a result, new tank vessels have to compete with older vessels with higher maintenance costs under the same low freight rates without obtaining premium for their high quality.<sup>69</sup> Furthermore, insurance underwriters also have been slow to reward quality tonnage with lower premiums and are not convinced of the reduction of risks by a double-hull tank vessel to reduce premiums.<sup>70</sup> Given the limited financial resources, shipowners would offset increased insurance costs by reducing the level of safety activity on operation and maintenance.<sup>71</sup>

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66. See *id.* at 90-91, 93.

67. See *id.* at 91.

68. See *id.* at 93, 95; Aviva Freudmann, *Oil Tanker Owners Adjust to Risks Under Pollution Law*, J. COMMERCE, Feb. 21, 1991, at 9A; Janet Porter, *Operators Fear Rush to Replace Old Ships*, J. COMMERCE, Aug. 26, 1993, at 6A.

69. See *Amoco Trims Charters*, PLATT'S OILGRAM NEWS, Feb. 3, 1993, at 1; Morgan, *supra* note 50, at 18.

70. See Patrick Crow, *Owners' View of Tankers*, OIL & GAS J., Mar. 8, 1993, at 23; Morgan, *supra* note 50, at 18; Robin Buckner Price, *U.S. Oil Spill Law to Cause Growing Tanker Problem*, OIL & GAS J., Sept. 30, 1991, at 21.

71. See *Oil Pollution Liability and Compensation Act: Hearing and Markup on Title III of H.R. 1465 Before the Subcomm. on Human Rights and International Organizations of the H. Comm. on Foreign Affairs*, 101st Cong. 33 (1989) (Temple, Barker & Sloane, Inc., Analysis of Alternative Approaches to Tanker Oil Spill Liability and Compensation); *The Federal Requirements for Vessels to Obtain Evidence of Financial Responsibility for Oil Spill Liability Under the Oil Pollution Act of 1990: Hearing Before the Subcomm. on Coast Guard and Maritime Transportation of the H. Comm. on Transportation and Infrastructure*, 104th Cong. 13 (1996) (statement of Winthrop

The preference of charterers for low freight rates over quality of tank vessels would, in turn, undermine an incentive for shipowners to take risk reduction steps, discouraging quality tonnage.<sup>72</sup> Oil companies' disincentives to charter sound vessels have produced derivative disincentives of shipping companies to maintain sound tonnage. There is little incentive for tanker owners to replace or modernize their fleets.<sup>73</sup> The potential of unlimited liability under OPA 90 is discouraging the formation of capital needed to acquire new tonnage. The depressed freight rates have failed to differentiate vessels in terms of quality by formulating a two-tier freight market. This development is also discouraging investment in new tonnage and delaying the replacement of old tonnage. In addition, financial institutions facilitate this situation by emphasizing the cash flow from operations instead of vessel asset values in their loan business.<sup>74</sup> The shipping companies have taken advantage of cost-efficient older single-hull tank vessels. This could have significant implications on the control of oil pollution risks as well as shipping logistics and oil distribution costs, while the availability of imported crude is barely affected.<sup>75</sup>

## 2. *The Paradoxical Effect of Double-Hull Requirements*

The retirement deadlines of single-hull vessels under OPA 90 have had the paradoxical effect of encouraging tanker owners to operate their vessels up to the end of their legal economic lives because the deadlines reduce the resale value of vessels nearing their end.<sup>76</sup> In particular, OPA 90 exempts single-hull vessels operating in designated lightering zones or deepwater offshore oil ports, such as LOOP, until 2015.<sup>77</sup> Large tankers are employed for long-haul oil transportation to take advantage of the benefits of the lower unit cost of transportation. However, large tankers cannot be accommodated to discharge their cargo in U.S. ports because of insufficient

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Wyman, Vice Chairman, OMI Petrolink Corporation); PETROLEUM INDUS., *supra* note 32, at 77.

72. See *Oil Pollution Liability and Compensation Act: Hearing and Markup on Title III of H.R. 1465 Before the Subcomm. on Human Rights and International Organizations of the H. Comm. on Foreign Affairs*, 101st Cong. 16 (1989) (statement of Jeffrey N. Shane, Assistant Secretary for Policy and International Affairs); *Certificates of Financial Responsibility under the Oil Pollution Act: Hearing Before the Subcomm. on Coast Guard and Navigation of the H. Comm. on Merchant Marine and Fisheries*, 102d Cong. 159 (1991) (statement of Bjorn Wilhelmsen, Board Member, Senior Shipping Advisor, I.M. Skaugen of Oslo, Norway).

73. See Rodriguez & Jaffe, *supra* note 42, at 26-27.

74. See Joseph Bonney, *Money for Ships? "Yes, but..." Financial Sources of Shipping Lines*, AM. SHIPPER, May 1993, at 36; *Amoco Trims Charters*, *supra* note 69; Morgan, *supra* note 50, at 18.

75. See PETROLEUM INDUS., *supra* note 32, at 90.

76. See Freudmann, *supra* note 68.

77. See 46 U.S.C. § 3703a(b) (1999).

water depth.<sup>78</sup> This exemption from the double-hull requirement would postpone the retirement of large single-hull tankers of 150,000 deadweight tons or above, for which unloading long-haul source oil in the lightering zones or at the deepwater port is economical. Furthermore, oil tankers calling at LOOP receive discounts on the surcharge of the P&I Clubs and premiums of \$200 million additional coverage because LOOP is located in a low risk area, meaning not a susceptible shoreline or an area of commercial development.<sup>79</sup> However, Aframax or Suezmax tankers (between 80,000 and 150,000 deadweight tons) are proper for the short- and medium-haul trade from South America and the Caribbean because they are able to deliver their oil cargo directly to the ports, unlike the larger tankers employed for long-haul imports from the Middle East and Africa.<sup>80</sup> Because unloading offshore is not economical for them, smaller single-hull tankers that sail directly into ports without lightering or with partial lightering are expected to be scrapped in accordance with the economically determined scrapping age or to be phased out by 2010, in accordance with the retirement schedule of single-hull tankers under OPA 90.<sup>81</sup> In the near future, the market for smaller tankers will be tightened because of the scrapping of the old tankers built in the 1970s, facilitated by OPA 90 and MARPOL 13G. A surplus is expected for larger tankers, particularly Very Large Crude Carriers (VLCCs).<sup>82</sup> In turn, this economic impetus is caused by the increase in long-haul crude oil imports.<sup>83</sup>

In comparison with double-hull tankers, older single-hull tankers can continue to operate profitably, even with lower charter rates, because of their sufficiently lower capital and operating costs.<sup>84</sup> In addition, there are no longer discounts in P&I premiums for double-hull tankers. Discounts in P&I premiums are conferred on all vessels with segregated ballast tanks (SBTs). As a result, "there are currently no significant [disparities] in P&I insurance costs between double-hull and single-hull tankers."<sup>85</sup> The

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78. See PETROLEUM INDUS., *supra* note 32, at 61; KENDALL & BUCKLEY, *supra* note 38, at 386; DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 14, 46; ENERGY INFO. ADMIN., *supra* note 1, at 38.

79. See U.S. COAST GUARD, REGULATORY IMPACT ANALYSIS: FINANCIAL RESPONSIBILITY FOR WATER POLLUTION (VESSELS) 78 (1994); Robin Buckner Price, *U.S. Oil Spill Law to Cause Growing Tanker Problem*, OIL & GAS J., Sept. 30, 1991, at 21, 26.

80. See DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 43-45, 63; Steven Anastasion et al., *Commentary: Oil Pollution Act of 1990: Offshore Oil Spills, the Tanker Business and the Regulation of Pollution Control*, 27 MARINE TECH. SOC'Y J. 68, 74 (1993).

81. See DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 49-51, 63, 148.

82. *Id.* at 76.

83. See *id.* at 63.

84. See *Dangerous Waters*, *supra* note 51; Bamber, *supra* note 63.

85. DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 90.



operation of single-hull tank vessels has resulted in economic penalties to companies operating double-hull tank vessels.<sup>86</sup> Chronic inadequate freight rates to provide the financial resources needed for the construction of double-hull tankers, the absence of significant discriminative rate premiums for double-hull tankers, and the dominance of spot chartering over period chartering have all contributed to the stagnation in orders for new tankers by independent owners. This implies that the tanker market is profitable for the operation of older single-hull tankers but not strong enough to compensate for the costs of new double-hull tankers.<sup>87</sup> In particular, shipping companies that continue to operate have difficulty competing with oil companies and shipping companies that "milk" their old single-hull vessels to eventually dispose of their shipping operations.

Shipowners are likely to be tempted to continue to operate their single-hull VLCCs built before 1994 and to reap the benefit of relatively low costs by taking maximum advantage of the OPA 90 exemption.<sup>88</sup> If they can be operated economically, some single-hull VLCCs are expected to continue to trade to the United States until 2015, according to the retirement schedule under MARPOL 13G. The recovery of freight rates would extend the larger tanker's life with protectively located segregated ballast tanks (PL/SBT),<sup>89</sup> protectively located double-sides (PL/DS), protectively located double-bottoms (PL/DB), or hydrostatically balanced loading (HBL).<sup>90</sup> This life extension incurs an increase in operating costs for older tankers because of special surveys required. The use of HBL will reduce cargo capacity and revenues. However, the advantages of low capital and operating costs can offset these economic disadvantages.<sup>91</sup> In addition, reduced cargo capacity would increase tank vessel traffic and thus increase oil pollution risks.<sup>92</sup>

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86. See *Structural Measures to Reduce Oil Spills from Existing Tank Vessels Without Double Hulls*, 62 Fed. Reg. 1622, 1625 (Jan. 10, 1997) (to be codified at 33 C.F.R. § 157).

87. *DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT*, *supra* note 10, at 83-84, 95.

88. See *PETROLEUM INDUS.*, *supra* note 32, at 87.

89. "'Segregated ballast' means the ballast water introduced into a tank which is completely separated from the cargo oil and oil fuel system and which is permanently allocated to the carriage of ballast or to the carriage of ballast or cargoes other than oil or noxious substances...." Regulations for the Prevention of Pollution by Oil, MARPOL 1(17) (on file with Natural Resources Journal). A protectively located segregated ballast tank means that SBT provides "a measure of protection against oil outflow in the event of grounding or collision." Modifications and Additions to the International Convention for the Prevention of Pollution from Ships, MARPOL 13E (on file with Natural Resources Journal).

90. See *DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT*, *supra* note 10, at 48-51, 63, 94.

91. See *id.* at 148.

92. *Structural Measures to Reduce Oil Spills from Existing Tank Vessels Without Double Hulls*, 62 Fed. Reg. 1622, 1625 (1997).

#### IV. CONCLUSION

The adverse selection of tankers will become serious in U.S. waters as the international VLCC fleet ages and other nations, such as Japan and Korea, introduce age restrictions on vessels calling on their ports. This trend is ultimately attributable to charterers taking advantage of the low rates instead of avoiding old single-hull tankers. The three sectors—shipping, P&I insurance, and oil cargo—generate synergetic effects toward this undesirable direction. This dilution of incentives is barely handled by stringent liability on the shipping sector. The oil cargo sector is the service consumer of the shipping sector. Tankers are exclusively designed for oil transportation. Oil companies are relatively limited in number, while shipping companies are prone to competition. These factors make it possible for oil companies to exercise control over the shipping sector by selective chartering. It is necessary to generate incentives for the oil cargo sector to charter selectively and thus to induce the shipping sector to take safety steps. As they continue to operate years into the future, single-hull tank vessels will pose significant oil spill risks because of structural deficiencies such as thin plating and unsatisfactory maintenance and repairs.<sup>93</sup> It is necessary to take appropriate measures to ensure the adequate maintenance and operation of the older VLCCs operating under the exemption of OPA 90.<sup>94</sup>

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93. See Chris Chivers, *Troubled Waters: Despite a Wake up Call Named Exxon Valdez, Oil Tankers Continue to Foul the World's Waterways* E: THE ENVTL. MAG., May/June 1996, available at [http://findarticles.com/p/articles/mi\\_m1594/is\\_n3\\_v7/ai\\_18378773](http://findarticles.com/p/articles/mi_m1594/is_n3_v7/ai_18378773) (last visited Nov. 4, 2007).

94. See DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT, *supra* note 10, at 147.

## APPENDIX

Phaseout Schedule for Vessels Without Double Hulls by Size and Age<sup>95</sup>

SIZE OF VESSEL (GT)	5,000-14,999		15,000-29,999		> 30,000	
	single hull	double sides or double bottom	single hull	double sides or double bottom	single hull	double sides or double bottom
1995	40	45	40	45	28	33
1996	39	44	38	43	27	32
1997	38	43	36	41	26	31
1998	37	42	34	39	25	30
1999	36	41	32	37	24	29
2000	35	40	30	35	23	28
2001	35	40	29	34	23	28
2002	35	40	28	33	23	28
2003	35	40	27	32	23	28
2004	35	40	26	31	23	28
2005	25	30	25	30	23	28
2006	25	30	25	30	23	28
2007	25	30	25	30	23	28
2008	25	30	25	30	23	28
2009	25	30	25	30	23	28
2010	25	30	25	30	23	28
2011		30		30		28
2012		30		30		28
2013		30		30		28
2014		30		30		28
2015		30		30		28

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95. *Id.* at 22.