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The Global Environment: A Proposal to Eliminate Marine Oil Pollution†

ABSTRACT

The authors begin their examination of the ocean pollution problem with a review of recent tanker accidents that have had long- and short-term effects on the integrity of marine ecology. Further inquiry leads to a focus on flagship-of-convenience tankers that appear to contribute disproportionately to the oil production problem but are not the sole cause. Routine discharges of oil ballast by the tanker fleets of all registries are even more at fault. The authors then explore both international and unilateral efforts to reduce the problem, or at least contain its dimensions. Finding these efforts to be unavailing, the authors propose an economic incentivedisincentive system that can be implemented internationally or unilaterally, and a phasing out of flagships-of-convenience. In a closing segment of the paper the authors reinforce their legal and economic analysis with an evaluation of the relevant ethical issues that are involved.

Marine oil pollution is a direct result of the Western industrialized world's dependence on the petroleum of the oil-rich Middle-East.¹ Estimates of oil lost or discharged to the sea by tankers during transport range from one to two million tons annually.² Of this, approximately 75 percent is due to "operational" discharges—that is, the deballasting, tank-washing, and tank-washing premaintenance of oil tankers after their cargoes have been unloaded and they are headed back for a new load.³ The remaining 25 percent is due largely to oil spills, with offshore drilling contributing a comparatively negligible amount.⁴ Since "operational"

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1. Dempsey & Helling, *Oil Pollution by Ocean Vessels—An Environmental Tragedy: The Legal Regime of Flags of Convenience, Multilateral Conventions, and Coastal States*, 10 DEN. J. INT'L L. & POL'Y 37, 49 (1980).

2. D. ABECASSIS, *THE LAW AND PRACTICE RELATING TO OIL POLLUTION FROM SHIPS* 4 (1978).

3. Clausen, *Liability for High Seas Oil Pollution Clean Up Costs: Domestic and International Provisions*, 3 HASTINGS INT'L & COMP. L. REV. 473, 481 (1980).

4. de Mestral, *The Prevention of Pollution of the Marine Environment Arising from Offshore Mining and Drilling*, 20 HARV. INT'L L.J. 469-71 (1979).

discharge takes place over long distances on relatively widespread routes, the impact on the environment is not readily discernible because the oil is dispersed and the threat to plant and animal life is fairly minimal. When ships collide or run aground and spill large amounts of oil in a finite area tanker accidents create a real threat and damage to an ecosystem by oil pollution.⁵ Recent oil spills emphasize the seriousness of the threat of oil pollution to the oceans.

Spills over the past fifteen years have increased both in frequency and magnitude, resulting in damage to a substantial area of coastline.⁶ Major oil spills that have attracted considerable public attention date back to the *Torrey Canyon* disaster of 1967 in which 117,000 tons of oil were spilled into the English Channel at a cleanup cost of some \$5 million.⁷ Such disasters continued throughout the past two decades. Among these were the Santa Barbara channel oil well blowout of 1969, in which 13,888 tons of oil spilled into the waters along the California coast at a cost of \$8.5 million; the 1974 *Metula* sinking in the Strait of Magellan in which 50,000 tons of oil were lost; the 1976 Chesapeake Bay spill in which 256,000 gallons were lost in Virginia inland waters; the *Argo Merchant* spill off Nantucket, Massachusetts, in which 7.2 million gallons of oil were lost costing \$5.2 million to clean up; and the sinking of the supertanker, *Amoco Cadiz* which dumped 69 million gallons of oil off the coast of Brittany in 1978.⁸ This last spill was considered to be the worst shipwreck in history, with clean up costs of \$30 million. Of the 250,000 tons of crude oil spilled, only about 15 to 20 percent was recovered. The rest remains in the sea.⁹

The devastating effects of an oil spill on a marine environment can be best illustrated by some specific examples. Birds, for instance, have been killed in great numbers due to suffocation and poisoning. The *Torrey Canyon* disaster resulted in the death of more than 25,000 seabirds, most of which were killed by the toxic detergents used to break down the slick.¹⁰ The Santa Barbara blowout caused at least 3,600 birds to be killed. Likewise, the *Metula* spill caused the death of 3,000 to 4,000 birds.¹¹ Studies have shown that the deaths of these birds were the result of oil coating their feathers, making them less buoyant and susceptible to drowning. They were also poisoned when the oil was ingested during preening, but birds are not the only wildlife affected by oil spills.

Algae, plankton, shellfish, fish, and large mammals all have died as

5. Dempsey & Helling, *supra* note 1, at 49.

6. *Id.* at 45.

7. Gundlack, *Oil Tanker Disasters*, 19 ENVIRONMENT 18 (Dec. 1977).

8. *Id.* at 19.

9. Dempsey & Helling, *supra* note 1, at 44.

10. *Id.* at 45.

11. *Id.*

a direct result of exposure to oil in a spill.¹² The *Amoco Cadiz* accident alone temporarily destroyed over 2,000 acres of oyster beds, which constituted one-third of France's commercial seafood market that year. Sixteen days after the same spill, the bodies of dead urchins littered one-and-a-half miles of beach.¹³ The Santa Barbara spill substantially decreased the surrounding phytoplankton biomass, and large mammals and their young, including seals, sea elephants, and one porpoise, were found dead, presumably, from oil poisoning. Shore plants and animals were also killed in this incident as a result of being smothered by the oozing oil.¹⁴ In the Buzzard's Bay incident, where 700 tons of oil were spilled off the Massachusetts coast, William Wertenbaker made this startling observation: "In scientific generalities, the marine animal population of the area, in the course of the next week or so, declined from about 200,000 animals per square metre to about two animals per square metre."¹⁵

The immediate effects of an oil spill on a marine environment are obvious, as demonstrated above. Depending on such factors as the proximity of a spill, tidal conditions, wave activity, and toxicity of the spilled crude oil,¹⁶ the results of a spill can be disastrous to marine life. "[T]he Cousteau Society has stated that the long-range effects of such spills . . . affect the reproductive capacity of various species of marine life and also interfere with the ocean food chain link by killing important food sources of otherwise unaffected marine life."¹⁷ This is particularly disturbing because the food chain, of which man is a part, has its beginnings in the oceans.¹⁸

It is clear that the continued need for oil will make heavy demands on ocean routes for years to come. This article will address the problem of the environmental or social cost that these transportation routes impose in the form of tanker accidents and the routine discharges of tanker fleets. These costs jeopardize the integrity of our global ecology, and they are simply not accounted for in the market price of oil. The principal objective of this article is to account for these costs by examining, first, the root causes of marine oil pollution: the licensing and operation of flag of convenience ships, a system that threatens the marine environment through its high susceptibility to accidents and spillage, and the discharge of oily ballasts into the seas as a standard operating procedure. Second, international cooperative methods of resolving the problem, unilateral efforts by the United States and Great Britain, and the emerging potential and

12. *Id.* at 46.

13. *Amoco Cadiz: A Lasting Disaster*, 144 *SCI. NEWS* 85 (Aug. 5, 1978).

14. Dempsey & Helling, *supra* note 1, at 46.

15. Wertenbaker, *A Small Spill*, *NEW YORKER* (Nov. 26, 1973) at 68.

16. Dempsey & Helling, *supra* note 1, at 46.

17. *Id.* at 47.

18. *Id.* at 48.

problems of a superfund and a strict liability model will be explored. The concluding section will propose a system of fees or charges that is reinforced by widely-based moral and ethical considerations; the rational, cross-cultural appeal of these moral propositions support the implementation of a control system that does indeed account for all costs of oil transport (market and social).

THE ROOTS OF THE PROBLEM OF MARINE OIL POLLUTION

Flags of Convenience

Under current rules of international law, each nation has the right to allow ships to fly that nation's flag or, in other words, to allow ships from different countries to register under a nation which has no other connection with such ship.¹⁹ The main flag of convenience countries (FCCs) are Liberia, Panama, and Honduras. Liberia is by far the leading grantor of flags, with ship registration fees comprising approximately eight percent of its gross national product.²⁰ The advantages of this arrangement to shipowners are numerous and largely financial in nature. The attributes of flag of convenience registry to United States vessels have been summarized as follows:

- 1) Transfer to a foreign flag increases the market value of the ship.
- 2) Transfer reduces operating costs, particularly for wages and maintenance of good working conditions, due to lower standards permissible under foreign flags.
- 3) Transfer makes possible operating in world trade with easy currency conversion.
- 4) Transfer allows the owner to avoid United States Coast Guard requirements governing the condition of the vessel.
- 5) The owner may affect repairs abroad at less cost than the same repairs in the United States.
- 6) The owner can save money by avoiding United States income tax.
- 7) Ultimately, as a result of increased earnings, the owner's financial ability to acquire new tonnage is improved.²¹

Furthermore, registration of ships under flags of convenience is a very simple process. In order to register a vessel, the person or corporation wishing to do so does not have to go to the respective country. In the United States, one may register a ship under the Liberian flag by con-

19. Payne, *Flags of Convenience and Oil Pollution: A Threat to National Security?*, 3 Hous. J. INT'L L. 67, 68 (1980).

20. *Id.* at 72-73.

21. Dempsey & Helling, *supra* note 1, at 50.

tacting the Liberian Consul or their shipping offices in New York City.²² A registration fee and an annual fee based on tonnage are normally the only charges made, and a guarantee or acceptable understanding regarding future freedom from taxation may also be given.²³

Construction and operating costs under a flag of convenience fall dramatically below the costs of a ship under American registration. Because labor costs are higher in the United States than in Japan, for instance, a typical 200,000 ton supertanker, which cost approximately \$90 million in the United States in 1977, could have been purchased for as little as \$40 million in Japan.²⁴ In addition, nations interested in having strong commercial fleets provide government subsidies for construction. Therefore, American-owned corporations cannot realistically expect to build their ships in the United States and still be able to compete with ships built in other countries.

Relatively inexpensive labor to operate the vessel seems to be another major reason for using flags of convenience. It has been estimated by shipping interests that for a 50,000 ton tanker, a thirty-two man crew would cost \$1.7 million a year at 1977 American wages.²⁵ By using the Liberian flag, a shipowner could hire crews of other nationalities at the following 1977 rates: all-Italian, \$600,000 a year; British, \$500,000; or Spanish, \$450,000.²⁶

One can conclude from the high costs of ship construction, maintenance, and operation in the United States that a United States registered vessel cannot compete with foreign ships without substantial government subsidy. U.S. operating costs are as much as 70 percent higher than those of foreign registered vessels. The transportation of oil on the world market is intensely competitive. Hence, in the absence of governmental subsidization, United States oil tankers can remain competitive only by operating under flags of convenience.²⁷

Relative freedom from control by the country of registry is another reason why flags of convenience are preferred. The vast majority of FCCs are classified as developing or Third-World states. By definition they have a lower standard of living and are less industrialized. Their economic conditions are such that this method of income is acceptable and they are, therefore, much less prone than developed countries to try to exercise control over the powerful multinational corporations with which they do

22. Payne, *supra* note 19, at 70.

23. *Id.* at 70.

24. *Recent Tanker Accidents, Part I, Hearings Before the Senate Comm. on Commerce, Science and Transportation*, 95th Cong., 1st Sess. 79 (1977) (statement of R.J. Blackwell, Asst. Sec. for Maritime Aff., MarAd., Commerce Dept.).

25. *Id.* at 33 (statement by W.T. Coleman, Jr., Sec. DOT.).

26. *Id.*

27. Dempsey & Helling, *supra* note 1, at 51.

business. It is unrealistic to expect these countries to enforce the stringent standards required by the United States,²⁸ because it would be contrary to their economic development. Herein lies the major problem of flags of convenience. Due to this lax control, fleets of ships bearing these flags are characterized by inadequately trained crews and frequent collisions. Too often this combination has resulted in disastrous oil spills.²⁹

Oil Pollution from Routine Discharges

Flags of convenience play a significant role in the continuing problem of oil spills, but the major source of oil pollution continues to be the deliberate pumping of oil into the sea by tankers.³⁰ The vast majority of ships use sea water as ballast subsequent to their deliveries of oil and, prior to being refilled with oil, pump the ballast water back into the oceans. In light of the fact that approximately one-fifth of the world's merchant fleet is engaged in transporting oil, this method of disposing of ballast water contributes significantly to ocean pollution.³¹ Therefore, while flag of convenience tankers *per se* cannot be viewed as the main threat to oceans because of their accidents, it may be argued that since flag of convenience ships are primarily responsible for transporting oil to the United States and around the world, both sources of pollution may be attributed to them.³²

For these reasons, international efforts have been mounted to eliminate flag of convenience registry, but they face strong opposition from flag of convenience nations and from the United States. Little has been accomplished to date.³³ Because of the abuse of international law by flag of convenience ships,³⁴ some means of effectively holding polluters accountable must be developed. Most projections indicate that oil pollution will be increasing as more offshore drilling, transportation of oil over the seas, and storage and processing facilities along the coast are utilized. This increased activity will be necessary to sustain the 3.3-4.4 percent annual increase predicted in demand for oil.³⁵ The Global 2000 Report to the President of the United States concluded:

More petroleum pollutants will enter the oceans. Proliferation of onshore and offshore power plants will result in extensive use of

28. Payne, *supra* note 19, at 72.

29. Dempsey & Helling, *supra* note 1, at 40.

30. Payne, *supra* note 19, at 81.

31. Bergman, *No-Fault Liability for Oil Pollution Damage*, 5 J. MAR. L. & COM. 1, 6 (1973).

32. *Id.* at 5

33. Note, *Protection of the High Seas from Operational Oil Pollution: A Proposal*, 6 FORDHAM INT'L L.J. 72, 80 (1982-83).

34. Dempsey & Helling, *supra* note 1, at 40.

35. UNITED STATES COUNCIL ON ENVIRONMENTAL QUALITY, THE GLOBAL 2000 REPORT TO THE PRESIDENT OF THE UNITED STATES, ENTERING THE 21ST CENTURY (1980), [hereinafter referred to as GLOBAL 2000].

TABLE 1
Best Estimates of Petroleum Hydrocarbons Introduced into the Oceans
Annually

<i>Source</i>	<i>Best Estimate</i>	<i>Probable Range</i>
	<i>(millions of metric tons)</i>	
Natural seeps	0.6	0.2-1.0
Offshore production	0.08	0.08-0.15
Transportation		
LOT tankers	0.31	0.15-0.4
Non-LOT tankers	0.77	0.65-1.0
Dry docking	0.25	0.2-0.3
Terminal operations	0.003	0.0015-0.005
Bilges bunkering	0.5	0.4-0.7
Tanker accidents	0.2	0.12-0.15
Nontanker accidents	0.1	0.02-0.15
Coastal refineries	0.2	0.2-0.3
Atmosphere	0.6	0.4-0.8
Coastal municipal wastes	0.3	—
Coastal nonrefining industrial wastes	0.3	—
Urban runoff	0.3	0.1-0.5
River runoff	1.6	—
Total	6.113	

Source: United States Council on Environmental Quality, THE GLOBAL 2000 REPORT TO THE PRESIDENT OF THE U.S., ENTERING THE 21st CENTURY (1980) p. 132.

oxidants and other biocides (especially chlorine) to prevent biological fouling in cooling towers, entrainment, and thermal pollution, altering the habitat of marine organisms. The increased use of nuclear energy may lead to accidental release or to deliberate disposal of radioactive materials in the oceans.³⁶

This study states that the increased use of fossil fuels will aggravate the existing problems of coastal zone degradation. The oil pollution from routine discharges from tanker operations is greater in volume than pollution from oil spills, and will present a greater long-term threat to the marine environment.³⁷ See the estimates of quantities of hydrocarbons entering the ocean annually in Table 1.

The general consensus is that oil pollution is likely to increase unless immediate antipollution standards are implemented. The operational discharges are directly related to the levels of world trade in oil³⁸ and to the use of faulty vessels commonly protected by the flags of convenience system.³⁹ The expected rise in crude oil trade emphasizes the need for

36. *Id.* at 121.

37. *Id.* at 132.

38. D. ABECASSIS, *supra* note 2, at 6.

39. Note, *supra* note 33, at 72.

efforts to prevent oil pollution.⁴⁰ In confronting a problem of such magnitude, this article turns now to an examination of existing national and international efforts to prevent oil pollution, as well as efforts involving comparable problems.

MULTILATERAL EFFORTS AT OIL POLLUTION RESOLUTION

International Conventions

International environmental problems are usually handled in the manner of comparable international disputes, by the United Nations and its numerous special agencies. The International Maritime Organization (IMO) is the agency responsible for marine pollution matters. It is among the smallest of the United Nations' agencies and its predecessor, the Intergovernmental Maritime Consultative Organization (IMCO), was established primarily as a "consultative and advisory" body.⁴¹ Nevertheless, IMCO drafted most of the multilateral conventions on the protection of the marine environment. The role of IMO today, like that of IMCO in previous years, is strictly advisory. It may do no more than submit proposals for maritime pollution liability to states, and these states are free to accept or reject them as binding conventions.⁴²

The 1954 International Convention for the Prevention of Pollution of the Sea by Oil was the first to be ratified. It adopted a zonal approach to marine pollution in that it prohibited the discharge of oil within fifty miles of land.⁴³ In order for it to enter into force, assent was required by ten governments, including five having not less than 500,000 gross tons of tanker tonnage. While the United States, Liberia, and Panama were not among the first to ratify, they have since done so.⁴⁴ Each ship must carry on board an oil record book, in the form provided by the Convention, which may be inspected by the proper authorities of any contracting state. Any violations must be reported to the government of the state of registry, which is then obliged to exact appropriate penalties according to its national laws.⁴⁵

In 1962 a conference was convened by IMCO to review this Convention. The conference adopted amendments extending this application to vessels of smaller gross tonnage, and extending the prohibited zones where no discharge is allowed.⁴⁶ As of 1980, there were fifty-two states

40. D. ABECASSIS, *supra* note 2, at 6; GLOBAL 2000, *supra* note 35.

41. Note, *supra* note 33, at 80, 81.

42. Dempsey & Helling, *supra* note 1, at 66, 67.

43. International Convention for Prevention of Pollution of the Sea by Oil 1954, 12 U.S.T. 2989, T.I.A.S. No. 4900, [hereinafter cited as 1954 Convention].

44. Dempsey & Helling, *supra* note 1, at 67.

45. 1954 Convention, *supra* note 43, art. II, VII, IX.

46. Bangladesh, Agricultural Commodities, Feb. 23, 1976, 27 U.S.T. 1515, 1523, T.I.A.S. No. 6109.

party to the Convention, which accounts for 95 percent of the world tanker fleet.⁴⁷

In 1969, IMCO promulgated the International Convention on Civil Liability for Oil Pollution Damage (Civil Liability Convention). It is the primary convention relating to liability for accidental or intentional damage caused by oil pollution.⁴⁸ The Civil Liability Convention is "a reaffirmation and elaboration of the general maritime law which imposes liability for damages from oil pollution caused by a ship or the persons responsible for the ship."⁴⁹ Although the Civil Liability Convention is a serious attempt to provide a remedy for damages caused by oil pollution, it applies only to damage caused in the territory of a signatory state. When one considers the potential harm caused by the introduction of oil into the marine environment, it becomes clear that "protection of the world's beaches and protection of the marine ecology itself are not synonymous."⁵⁰

Also adopted in 1969 was the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (Intervention Convention). It granted contracting states the right to take action against ships when casualties result in "major harmful consequences" to their coastline.⁵¹ Amendments in 1971 established construction standards based upon the ship's dimensions, providing for compartmentalization, limitations of tank sizes, and requirements involving the arrangement of tanks. However, neither of these amendments has yet received adequate ratification to enter into force.⁵²

In 1973, IMCO confronted the problem of prevention of oil spills rather than liability for those spills by adopting the International Convention for the Prevention of Pollution from Ships (Pollution Convention), which goes far beyond the provisions of the 1954 Convention and all of its subsequent amendments. The Pollution Convention prohibits the discharge of any substance which is likely to create a hazard to human health or to harm the living resources of the oceans. It applies not only to oil tankers, but to all vessels operating on the oceans.⁵³

Despite the strength of the Pollution Convention with respect to territorial waters, it remains ineffective as to violations which occur on the high seas. The observing state may notify the flag state of such incidents, but it is then the responsibility of the flag state to take action. When the

47. Dempsey & Helling, *supra* note 1, at 67.

48. Note, *supra* note 33, at 83.

49. Teclaff, *International Law and the Protection of the Oceans from Pollution*, 40 *FORDHAM L. REV.* 529, 541 (1972).

50. Note, *supra* note 33, at 83.

51. *Id.* at 84.

52. Dempsey & Helling, *supra* note 1, at 68.

53. See *International Convention for the Prevention of Pollution from Ships*, 12 *I.L.M.* 1319 (1973).

polluting ship flies a flag of convenience, there is simply no evidence that flag states follow up with enforcement measures.⁵⁴

Draft Conventions on the Law of the Sea

Recent efforts to control marine pollution are embodied in the Draft Convention on the Law of the Sea, created by the Third United Nations Conference on the Law of the Sea (UNCLOS III).⁵⁵ UNCLOS III, convened in 1973, was the result of a United Nations General Assembly Resolution calling for a

[c]onference on the law of the sea which would deal with the establishment of an equitable international regime . . . for the area and resources of the sea bed and the ocean floor. . . and the preservation of the marine environment, including . . . the prevention of pollution. . . .⁵⁵

The Draft Convention addresses a wide range of ocean related issues, including jurisdiction over territorial waters, areas of the oceans adjoining territorial waters, and matters relating to the use of the high seas. Articles 213 through 236 call on contracting flag states to prohibit ships under their registry from sailing unless they comply with domestic and international standards. However, their ability to do so is doubtful because most flag states have such limited resources with which to monitor their registrants. Moreover, the registered ships seldom if ever visit ports of the flag state.⁵⁶ Article 235 implies that contracting states are responsible for the fulfillment of their international obligations concerning the protection and preservation of the marine environment but does not provide any real penalties for states which fail to meet these obligations, nor does it discourage flag of convenience registry.⁵⁷ The provisions of the Draft Convention, although significant in that they are not framed as isolated responses to environmental problems, fail to establish an authority to enforce obligations with respect to violations.⁵⁸ The multilateral efforts presented here, while not a complete view of international response to the marine oil pollution problem, are, however, a fair representation of the general form of international legislation that has evolved over the last thirty years.

54. Note, *supra* note 33, at 85.

55. United Nations Convention on the Law of the Sea, U.N. Doc. A/CONF. 62/122 (Montego Bay, Jamaica, Dec. 10, 1982) [hereinafter cited as UNCLOS], *reprinted in* 21 I.L.M. 1261 (1982). UNCLOS codified existing international law and was signed by 117 nations, excepting the United States.

56. Note, *supra* note 33, at 85. *See also The Law of the Sea—Where Now?*, 46 LAW & CONTEMP. PROBS., quoting G.A. Res. 2750, 25 U.N. GAOR Supp. No. 28 at 242 U.N. Doc. A/RES/2750 (1970).

57. Note, *supra* note 33, at 89.

58. *Id.*, quoting U.N. Doc. A/Conf. 62/L. 78, art. 235(1) (1981).

UNILATERAL EFFORTS AT OIL POLLUTION RESOLUTION

United States Law

The first significant attempt in the United States to enact comprehensive legislation concerning tanker safety was the Ports and Waterways Safety Act of 1972.⁵⁹ It "attacked the problem of oil pollution prevention from two directions: traffic control procedures, and vessel design and construction."⁶⁰ The Trans-Alaska Pipeline Authorization Act of 1973 holds the vessel owner "strictly liable without regard to fault . . . for all damages, including clean up costs, sustained by any person or entity . . . as a result of discharges of oil" from vessels.⁶¹ The Deepwater Port Act of 1974 prohibits oil discharges from any of the facilities of the port or from any vessel operating to or from the port in a surrounding area technically denominated a "safety zone."⁶² The owner or licensee is subject to unlimited liability if it can be shown that the discharge occurred because of "gross negligence or willful misconduct within [his] privity and knowledge."⁶³ Absent such a showing, the limitation is \$50 million for the licensee and the lesser of \$150 per ton or \$20 million for the vessel owner.⁶⁴

In 1978, Congress enacted the most comprehensive and far reaching marine pollution prevention legislation in United States history, the Port and Tanker Safety Act, which provided for civil and criminal penalties so that "the vessel shall be liable and proceeded against wherever found."⁶⁵ The Secretary of Transportation is given investigatory powers, and the power to condition entry to ports of the United States. He also is given broad power to issue, amend, or repeal regulations relating to, among other things, cargo holds or tanks; handling or storage of cargo; duties, qualifications, and training of the officers and crew of a vessel; and the reduction or elimination of discharges during ballasting, deballasting, tank cleaning, cargo handling, or other such activity.⁶⁶

"[U]nited States law regarding liability for oil pollution has proceeded at an irregular pace, providing what may fairly be characterized as a patchwork scheme of liability limits, legal defenses, and compensation fund programs."⁶⁷ It currently attempts to reconcile its domestic programs with international programs on its own terms, and refuses to cooperate

59. *Id.*

60. Pub. L. No. 93-153, 87 Stat. 584, 43 U.S.C., §§ 1651-55 (1976).

61. Dempsey & Helling, *supra* note 1, at 76.

62. Deepwater Port Act of 1974, 33 U.S.C. § 1509(d) (1982).

63. 33 U.S.C. § 1517(d) (1982 & Supp. III 1985).

64. Dempsey & Helling, *supra* note 1, at 485, quoting 33 U.S.C. §§ 1517(d)-(e) (1976).

65. 46 U.S.C. § 391(c) (1982).

66. Dempsey & Helling, *supra* note 1, at 79-81.

67. Mendelsohn & Fidell, *Liability for Oil Pollution—United States Law*, 10 J. MAR. L. COMM. 475, 496 (1979).

with the world community in ratifying many of the major multilateral conventions now pending before it.⁶⁸

The United States has recently enacted more regulations which attempt to foster marine safety by requiring certain notice from vessels entering the territorial waters of the United States.⁶⁹ The vessels must give notice of their beneficial owners, notice of whether or not they are carrying oil or other dangerous cargo, and they must provide proof of financial responsibility for clean up costs or other damages which might be caused by the ship.⁷⁰

British Legislation

The United Kingdom enacted a series of statutes dealing with oil pollution, several of which represent domestic enactments of international conventions. The Oil in Navigable Waters Act of 1971⁷¹ enables the British government to take action against any ship in its territorial waters that has caused an oil pollution casualty, regardless of the ship's registry.⁷² The Merchant Shipping Act of 1971⁷³ (Oil Pollution Act) enacts into British law the International Convention on Civil Liability for Oil Pollution Damage.⁷⁴ The Oil Pollution Act provides for strict liability imposed on the owner of the ship, regardless of state of registry, and denies access to British ports that do not comply by showing a required certification of adequate insurance coverage.⁷⁵ The Merchant Shipping Act of 1974⁷⁶ is an enactment of the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage.⁷⁷ The Act establishes a fund to compensate any victim of oil pollution damage who is unable to obtain complete recovery from the party liable under the Oil Pollution Act.⁷⁸

The United Kingdom's legal regime corresponds very closely to the international framework. The victim is provided with as complete compensation as possible, and liability is placed on the parties who most fairly should bear it, the ship owner and the owner of the oil cargo.⁷⁹

68. Dempsey & Helling, *supra* note 1, at 84.

69. 33 C.F.R. § 161 (1985).

70. 33 C.F.R. §§ 135.401, 137.301-05 (1985).

71. 1971, ch. 21, 41 HALSBURY'S STATUTES at 1330, amending previous acts of 1955 and 1963 that give effect to the 1954 International Pollution Convention in the United Kingdom.

72. Dempsey & Helling, *supra* note 1, at 72.

73. 1971, ch. 59, HALSBURY'S STATUTES at 1345.

74. 9 I.L.M. 45 (1970).

75. Dempsey & Helling, *supra* note 1, at 72.

76. 1974, ch. 43, 44 HALSBURY'S STATUTES at 1361.

77. 11 I.L.M. 284 (1972).

78. Dempsey & Helling, *supra* note 1, at 72, 73.

79. *Id.*

The "Superfund" Compensation System

The Comprehensive Environmental Response Compensation Liabilities Act of 1982, popularly termed "Superfund," is a progressive step towards a solution to the hazardous waste site problem.⁸⁰ The main drawback is that it comes into operation after the harm has occurred. This act has been criticized for failing to provide a mechanism for compensation of injured parties, in that there is no method to receive payment for damages caused by abandoned or inactive sites. The history of the Act indicates that several Superfund packages did provide substantial relief for third parties. However, Congress compromised in enacting the present act because of the expense of maintaining the fund if such relief were insured.⁸¹

Under the Superfund method, manufacturers of petrochemical feedstocks and toxic organic chemicals, and importers of crude oil pay into a trust fund to be used in certain qualified cases. Theoretically the fund should be a deterrent to oil pollution. In reality, this deterrent is illusory because companies feel insulated by this payment plan and may not elect to actively prevent oil pollution, especially pollution that is commonly accepted as operational.

The operational oil pollution caused by routine discharges has a cumulative long-term hazardous effect on the total environment. This effect will not be directly covered by Superfund which concentrates primarily on major oil spills or hazardous waste sites. Furthermore, sites targeted for clean up by use of Superfund monies have not to date been worked on at all, and there is evidence to suggest that technology is not advanced enough to treat such sites adequately even when the assigned task is undertaken.⁸² This technological problem, combined with lack of other resources such as trained specialists and the probability of inadequate funds, makes the Superfund solutions somewhat idealistic.

The Superfund legislation has been advanced as a breakthrough in dealing with pollution problems, but it should not be relied on in any sense to prevent pollution or to cure the problem, once created. Once oil pollution occurs, either from spills or routine discharges, no amount of money can fully restore the environment to its prior state. There are also inherent problems of enforcement of legislation such as Superfund and other after-the-fact remedies.

Reliance on a system of liability to overcome oil pollution has a number

80. CERCLA, 42 U.S.C. §§ 9601-9630 *et seq.* (1982).

81. Note, *Joint and Several Liability for Hazardous Waste Releases Under Superfund*, 68 VA. L. REV. 1157, 1169 (1982); Note, *Hazardous Waste: Third-Party Compensation for Contingencies Arising from Inactive and Abandoned Hazardous Waste Disposal Sites*, 33 S.C.L. REV. 543, 547 (1982).

82. CONSERVATION FOUNDATION, STATE OF THE ENVIRONMENT 156-57 (1982).

of shortcomings.⁸³ Oil pollution from tankers affects common waters, the ocean and coastal areas, which often makes it difficult to prove individual and other damages because states and nations are limited by their territorial waters. Identifying the source vessel of pollution is another problem. Due to these problems of establishing liability, the compensation of victims preferably should be accomplished through modifications of Superfund legislation whereby victims would be paid out of funds established by the oil industry.⁸⁴ Explicit protection of third parties, and an equitable statute of limitations should be added to such a system to make it credible.

The Current Liability System

The Tanker Owner's Voluntary Agreement on Liability for Oil Pollution (TOVALOP), created by seven major oil companies in 1970, reimburses national governments for preventative and clean up costs incurred as a result of a tanker spillage.⁸⁵ Over 99 percent of the world's privately-owned vessels are members of TOVALOP, but it places limits on liability and gives no assurance to governments of enforcement. A supplementary agreement in 1971 called The Contract Regarding an Interim Settlement to Tanker Liability for Oil Pollution (CRISTAL) involved thirty-eight companies and provided compensation for direct damages with a liability limit of \$36 million per incident.⁸⁶

Tankers under flags of convenience are not properly operated or maintained and are often involved in oil spill accidents and purposeful discharges. Yet, the country licensing the flag of convenience ships exerts little or no authority over such vessels and damages, even if assessed, are usually not paid. Additionally, although nations assess fines for violation of their oil pollution laws pertaining to tankers, the fines often are so low that they simply may not fulfill a deterrence function.⁸⁷

Civil liability for oil pollution damage is usually based on theories of negligence, nuisance, trespass, strict liability, or state statutory claims. "Because a victim of oil pollution may be left without a remedy if oil pollution causes damage in excess of the liability coverage of a vessel, strict liability has been utilized to reach owners and operators of vessels and onshore and offshore related facilities."⁸⁸ This trend demonstrates

83. R. STEWART & J. KRIER, ENVIRONMENTAL LAW AND POLICY 46-64 (Sup. 1982).

84. UNITED STATES DEPARTMENT OF COMMERCE, LEGAL, ECONOMIC, AND TECHNICAL ASPECTS OF LIABILITY AND FINANCIAL RESPONSIBILITY AS RELATED TO OIL POLLUTION (1970) (A study for the U.S. Coast Guard) [hereinafter cited as LEGAL, ECONOMIC, AND TECHNICAL ASPECTS].

85. Prevention of Pollution of the Sea by Oil: Amendments to the Convention of 1954, *Reprinted in* 9 I.L.M. 45 (1970).

86. Becker, *Acronyms and Compensation for Oil Pollution Damage from Tankers*, 18 TEX. INT'L L.J. 475-79 (1983).

87. OIL POLLUTION, A SURVEY OF WORLDWIDE LEGISLATION (E. Gold ed. 1978).

88. LEGAL, ECONOMIC, AND TECHNICAL ASPECTS, *supra* note 75, at 2.2-2.7.

that the initial risk of loss is placed on the oil industry. As noted earlier, however, the cost will be passed on to the consumer insofar as that is possible.⁸⁹ Therefore, even expanding liability of polluters will not necessarily burden only the producer, and such after-the-fact solutions will not stop pollution at its incipency.

United States and international laws regarding liability for oil pollution have resulted in a patchwork scheme of compensation programs, legal defenses, and limits on liability. In the United States, this pattern is even further confused by the constitutional restrictions upon states' powers to legislate in an area that involves federal legislation. The existence of diverse geographical and industrial areas subject to oil pollution and lack of coherence between national and international laws emphasizes the need to construct a framework of global controls or charges for pollution.⁹⁰ Charges for pollution give recognition to the common heritage of mankind, as all individuals regardless of nationality share the global commons.⁹¹ A charge system also allows coastal areas to preserve their interests in a regulatory system which will foster trade and attempt to compensate the public for use of the common property.

PROPOSALS

Problems With Existing Efforts

Despite international attempts to control oil pollution, pollution of the sea by oil continues to grow and this growth, of course, is caused mainly by waste disposal at sea,⁹² deballasting,⁹³ and major spills.⁹⁴ Regulations are slowly formed and, to date, have been largely ineffective.⁹⁵ The United

89. *Id.*

90. D. CUISINE & J. GRANT, *THE IMPACT OF MARINE POLLUTION* 310 (1980).

91. Lahey, *Economic Charges for Environmental Protection: Ocean Dumping Fees*, 11 *ECOLOGY L.Q.* 305, 315 (1984) (defining collective goods, such as clean air or water, as an environmental amenity).

92. O'Halloran, *Ocean Dumping: Progress Toward a Rational Policy of Dredged Waste Disposal*, 12 *ENVTL. L.* 745 (1982); see also *City of New York v. EPA*, 543 F.Supp. 1084 (S.D.N.Y. 1981); *Marine Protection, Research, and Sanctuaries Act of 1972*, 33 U.S.C. §§ 1401-44 (1982).

93. Deballasting is the single greatest source of oil or other pollution of the ocean, contributing 80 to 85 percent of the several million tons of oil spilled yearly. See R., M'GONIGLE & M. ZACHER, *POLLUTION, POLITICS, AND INTERNATIONAL LAW: TANKERS AT SEA 14-20* (1979); OFFICE OF TECHNOLOGY ASSESSMENT, *OIL TRANSPORTATION BY TANKERS: AN ANALYSIS OF MARINE POLLUTION* (1975); see also Note, *supra* note 33; Dempsey & Helling, *supra* note 1, at 42 n.15.

94. See Smets, *The Oil Spill Risk: Economic Assessment and Compensation Limit*, 14 *J. MAR. L. & COM.* 23 (1983); see also Hancock and Stone, *Liability for Transnational Pollution Caused by Offshore Oil Rig Blowouts*, 5 *HASTINGS INT'L & COMP. L. REV.* 377 (1982).

95. Comment, *The Impediments to Effective Regulation of Oil Tanker Traffic in United States Waters*, 51 *U. COLO. L. REV.* 77 (1979); Note, *The Clean Water Act of 1977: Expanded Competence Over Vessel Source Pollution*, 18 *VA. J. INT'L L.* 289 (1978); Dellapenna & Wang, *Protecting the Republic of China from Oil Pollution in the Sea: Accounting for Damages from Oil Spills*, 19 *TEX. INT'L L.J.* 115 (1984), citing Note *The International Environmental Law of the Sea: The Canadian Arctic Waters Pollution Act and Its Effects*, 1970-1980, 4 *SUFFOLK TRANSNAT'L L.J.* 139 (1980).

Nations Conventions have required each ratifying nation to participate by adopting rigid procedural safeguards against pollution and insuring that necessary steps be taken to enforce these safeguards.⁹⁶ The nations are supposed to enforce such standards against ships flying their flags, using their ports, and passing through their territorial waters.⁹⁷

Some states have used the Convention's delegation of power to enforce the international standards against ships that give evidence of a violation by causing or threatening to cause damage to the resources in the state's exclusive economic zone.⁹⁸ The main limitation faced by these states in exercising such jurisdiction over ships not flying their flag is that the state is subject to flag-state preemption. Flag-state preemption is the mandatory suspension of any proceeding by a coastal state for a violation beyond its territorial seas if the flag state involved takes action within six months. Furthermore, significant burdens of proof are required to establish offenses, such as proof the offense was committed by a particular ship and proof the ship was in violation of existing standards; then the ship must be freed upon posting of bond. Beyond this, states cannot impose standards concerning the construction, design, equipment, or manning of ships because it interferes with innocent passage.⁹⁹ Finally, international standards limit a ship's liability to \$160 per ton or a maximum of \$16,800,000, which may be supplemented by other agreements aggregating up to \$85 million coverage.¹⁰⁰

Statistics indicate that only a small percentage of all tankers are responsible for the operational oil pollution problem. It is estimated that 90 percent of the oil discharged from routine tanker operations comes from approximately 20 percent of all tankers.¹⁰¹ Industry attempts have been made to reduce these operational discharges by implementing specific discharge procedures, providing for specific designs in new tanker construction, and requiring monitoring and control of tanker discharge.¹⁰² This industry initiative has contributed improvements to the operational oil pollution problem such as the Load-on-Top method.¹⁰³ The Load-on-

96. Phillips, *The Economic Resources Zone—Progress for the Developing Coastal States*, 11 J. MAR. L. & COM. 349 (1980).

97. UNCLOS, *supra* note 55, at arts. 217, 218, 211(4), 220(2).

98. *Id.* at art. 220(3). The exclusive economic zone is the shoreline zone where discharge of oil into the sea is prohibited. The United States claims such protective domain outside of its exclusive fishing zone. See 33 U.S.C. 1321 (1982).

99. UNCLOS, *supra* note 55, at arts. 228, 220(5), 220(6), 220(7), 21(2). See Stanford, *Canadian Perspectives on the Future Enforcement of the Exclusive Economic Zone: A Paper in Diplomacy and the Law of the Sea*, 5 DALHOUSIE L.J. 73, 81-88 (1979); see also 33 U.S.C. §§ 1221-32 (1982).

100. Prevention of Pollution of the Sea by Oil: Amendments to the Convention of 1954, Oct. 21, 1969, arts. II, III, 28 U.S.T. 1205, T.I.A.S. No. 8505, reprinted in 9 I.L.M. 45 (1970) (this Convention has not been ratified by the United States but has been in force since 1977).

101. LEGAL, ECONOMIC, AND TECHNICAL ASPECTS, *supra* note 84.

102. D. ABECASSIS, *supra* note 2, at 28-30.

103. *Id.* at 42; D. CUISINE & J. GRANT, *supra* note 90, at 41, citing MARINE DIVISION OF THE DEPARTMENT OF TRADE, THE BATTLE AGAINST OIL POLLUTION AT SEA 3 (1976).

Top method was introduced in 1964 by the major oil companies to reduce oily discharges. It is now used by over 85 percent of the world's tankers. Basically, this method drains oil that collects on top of the water to be drained underneath, thus reducing the oil discharged into the ocean.

Despite these efforts, strong international leadership is needed in combating the operational oil pollution problem. All nations are affected to some degree by oil pollution, and there can be little argument that responsible action to control it would have widespread benefit to the marine environment, human health, commercial and sport fishing, quality of ocean water, and global amenities available.¹⁰⁴ While concern for the problem has produced a blizzard of paper solutions, the economic interests of nations that hold the key to a solution are the principal obstacle to achieving one.

The "tragedy of the commons," a phrase now synonymous with abuse of free or unpriced goods by individuals and business firms, is well illustrated by the problem of ocean pollution.¹⁰⁵ The system makes it profitable to continue to pollute the ocean. This international economic reality is fairly simple. The routine pollution of the ocean through oil discharges is less expensive than taking steps to make certain that the oil is placed in ecologically safe disposal facilities and that the ship and crew are capable of meeting the environmental challenge.

The following analysis adopts the view that the quality of the environment is a valuable resource and should be treated appropriately.¹⁰⁶ An economic analysis brings to the forefront the conflicting rights of individuals, multi-national energy firms, and nation-states, and serves as a tool to explain the interaction of market forces. Insights gained through this examination help in the development of legal solutions to the problems of protecting the quality of the environment. The effects of suggested legal reforms to deal with pollution, such as pollution from oil tankers, may then be evaluated in economic terms.

The role of economic analysis is to outline the basic relationships and responses between the parties involved. It is instrumental in devising governmental or institutional policies or changes, if needed. Institutional policies directed towards protecting environmental quality necessarily must be evaluated in terms of the demand to produce wealth and income, and support the technologically advanced society, in this case illustrated by the demand for oil.¹⁰⁷ Degradation of the ocean by oil pollution is primarily an example of a negative externality, or "side-effect" of the transport of oil. Nevertheless, some side-effects are attributable to care-

104. G. TIMARGIS, INTERNATIONAL CONTROL OF MARINE POLLUTION (1980).

105. G. Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 4348 (Dec. 1968).

106. J. HITE, H. MACAULEY, J. STEPP & B. YANDLE, THE ECONOMICS OF ENVIRONMENTAL QUALITY (1973).

107. *Id.* at 11.

lessness or ignorance and are not necessary. An unnecessary cost related to pollution by oil tankers is the careless operation of equipment by tanker crews. Such an identified side-effect may be addressed directly, through supervision or training of crewmen, or indirectly, through elimination of the flag of convenience registry system.

If oil pollution is to be reduced through specific measures, such as the elimination of flag of convenience registry and the reduction of operational discharges, the improvement of current practices must be insured by the strategic use of economic incentives and charges.¹⁰⁸ This judgment is amply supported by the foregoing analysis which can be summed up by saying that, under present arrangements it is simply cheaper for international oil firms to continue to pollute. The current flag of convenience licensing system allows countries to profit from licensing ships to operate without basic safety requirements, and promotes registration of faulty tankers and untrained crews. If a company owns ships which are older and unsafe, this system provides an incentive to allow the ship to deteriorate and sail under a flag of convenience rather than to upgrade and improve the tanker.¹⁰⁹

Similarly, the current system encourages tankers to continue cleaning and ballasting their ships, routinely allowing the oily debris to contaminate the ocean. The present market does not penalize the tank operators for following this routine procedure. Although it is technically feasible to avoid this problem simply by pumping this oily discharge into inland holding ponds, the economic incentives do not exist presently to support such an improvement. Therefore, although practicality dictates that production and transportation of oil must encompass some environmental damages, these environmental costs may be lowered without undue restrictions on the continued use of oil. The task essentially is to structure decisions that impact environmental quality in such a way that they enhance the long-term integrity of the environment rather than the short-term economic prospects of the firm.

Whether a proposed change is implemented, such as requiring tankers to discharge their oily debris into holding ponds, will depend on the relative costs and benefits assigned to the action. For example, in a case where the cost to the polluter of using the holding ponds is greater than the benefits from that use, there will be no inducement to spend money on a total containment type system. In fact it is probably too much to expect firms in a competitive industry to be guided by altruistic motives when the consequences of such behavior, more costs than benefits, will make them uncompetitive with rival firms that are not so inclined. There-

108. Note, *Deterring Air Polluters Through Economically Efficient Sanctions: A Proposal for Amending the Clean Air Act*, 32 STAN. L. REV. 807 (1980).

109. Note, *supra* note 33.

fore, if a legal constraint such as a land-based depository is imposed, and this constraint structures operations with goals other than optimization of oil production, it must be uniformly enforced by a multinational body. Determining whether a containment system should be utilized and, if so, how implemented, involves social policy considerations regarding who should bear the costs involved.¹¹⁰

One suggestion to allocate costs of oil pollution would be to force the polluter alone to internalize these costs because the pollution is a side-effect of its operations. This alternative fails to account for the reciprocal nature of social costs, however. After all, consumer demands for reduced prices encourage producers to minimize or avoid expenditures on pollution control devices. The longer these expenditures are postponed, the greater will be the sum of accumulated increment; eventually this will prove too much for the environment to assimilate. The cost of controlling pollution, then, is an expenditure demanded by a subsequent generation of consumers for whom preservation of water quality is more important than low prices. Therefore, polluting firms and the consuming public should be jointly responsible and charged for the cost of preventing pollution.¹¹¹

Current legislation clearly identifies the producer as responsible for pollution and forces the firm to pay for pollution as another expense of business operations.¹¹² Then, to the extent that the market will permit, this expense is pushed forward to consumers. But simply forcing the oil polluter to pay for the externality of oil pollution through liability for oil spills does not address the task of preventing environmental harm. This is a crucial problem because many attempts to identify and allocate costs of oil pollution operate under the false assumption that all pollution is a necessary byproduct of operations.¹¹³ At a minimum, stiff penalties should be imposed for routine, unnecessary pollution.

Because the commons area of the ocean cannot be fenced, a plausible strategy is one that makes it cheaper for the polluter to take action to preserve the water quality than to continue to pollute. Pollution taxes answer this need. If levied fairly and uniformly by an international body, shipping firms can decide for themselves on the basis of cost alternatives whether it is cheaper to pay the tax or to undergo the expense of revamping their operations and avoid the tax. The concept of private property encourages exploitation of "free" goods (The Commons), and this conduct results in long-term harm to others. But a tax on each unit of pollution induces some shippers to avoid pollution while, at the same time, building

110. Comment, *Water Law—Cessation of Return Flow as a Means of Complying with Pollution Control Laws*, 12 LAND & WATER L. REV. 431 (1977); see Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960).

111. Coase, *supra* note 110, at 41.

112. Federal Water Pollution Control Act, 33 U.S.C. §§ 1251, 1311(a) (1982).

113. LEGAL, ECONOMIC, AND TECHNICAL ASPECTS, *supra* note 84.

a "clean-up" fund to address the problems created by those who continue to pollute.

Despite the agreements embodied in international conventions, many are not widely accepted or enforced. Stringent enforcement is not followed because the nations must balance their desire to enhance freedom of navigation for commercial purposes and their desire to protect their natural resources, particularly in coastal zones, from oil pollution.¹¹⁴ Political compromises must be effected between nations that interact frequently and share commercial interests in oil shipments.¹¹⁵ There must be firm international commitment to abolish the flags of convenience and to provide adequate reception facilities for oil discharge from tank cleaning and ballasting. The responsibility for and costs of controlling oil pollution must be shared by those receiving the benefits, to assure that no one segment of society bears the unfair burden of having pollution costs forced upon it.

PROPOSED SOLUTIONS

Most economists regard natural resources such as the ocean as a property resource.¹¹⁶ The pollution of the ocean by oil, then, is viewed as a market failure because the market has not attached an appropriate price for its use or degradation. A charge system or a pollution tax places the burden of paying for the use or degradation of the ocean on the party benefitting from its use or degradation. Lacking this, the common resource will be freely abused and exploited. External or spillover effects impose the cost of abuse on other people. In the case of oil pollution, self-interested individuals and firms will continue to exploit the natural resources of water and coastal areas, causing spillover costs on others unless charged a fee.¹¹⁷

The Charge System

Market solutions, such as the charge system, are generally less coercive than other alternatives because they utilize motives of self-interest to promote social goals while allowing freedom of choice in action.¹¹⁸ Some economists also advance the charge system as flexible and adaptable.¹¹⁹

114. D. CUISINE & J. GRANT, *supra* note 90, at 95-115.

115. *Id.* at 95.

116. Lahey, *supra* note 91, at 315.

117. See J. DALES, POLLUTION, PROPERTY AND PRICES 93-100 (1968); Lahey, *supra* note 91, at 318.

118. C. SCHULTZE, THE PUBLIC USE OF PRIVATE INTEREST 16-18 (1977); Lahey, *supra* note 91, at 318.

119. Russell, *Economics and Marine Pollution* in IMPACT OF MARINE POLLUTION ON SOCIETY 284, 287 (1982); Lahey, *supra* note 91, at 318.

Other supporters would argue that it is an appropriate system because it is fair, *that is*, it attempts to measure the use of the environment in economic terms. Since those benefitting from pollution are compelled to pay, this system generates a just result while, at the same time, compelling an efficient one.

The charge system must be evaluated in comparison to other possible approaches. For example, oil pollution from tankers has not been successfully controlled by direct government regulation, which is the method now in operation. Most supporters of the charge system argue that it is more cost efficient than direct regulation.¹²⁰ This is founded in the belief that a charge system gives the polluter flexibility and incentive to develop less expensive and alternative waste systems. Direct regulation, it has been argued, stifles the creativity and initiative of firms desiring to develop sophisticated technologies that will combat pollution.¹²¹

The charge system is appropriate to control operational oil pollution, that is, caused by the flag of convenience ships. Parties who wish to pay the charge to continue the present methods of tanker operations under flags of convenience would be assessed an amount for the right to exercise that choice. This charge would force the polluting firm to pay for the pollution it is causing. Thus, the polluter will choose this option only if it is economically worthwhile to him. The charge system here is preferable because technological advancements in routine tanker operations and construction should not be stifled by direct government regulation which involves slow rulemaking and enforcement. The charge system is an appropriate way to address the flag of convenience system because it allows freedom of choice for those nations and firms that find it profitable to continue to utilize flags of convenience.

Social Costs and Purpose

Ideally, the charge system should reflect the actual price of pollution, the social cost imposed by the polluter. Social cost in this example would be equal to the external, spillover costs created by the polluter whose use of the common property imposes a cost/detriment on others, such as a reduction in the quality of the ocean. Determining this rate would involve determining the amount of harm caused by each marginal unit of oil discharged.

This method would be practical in dealing with pollution from routine

120. A. KNEESE & C. SCHULTZE, POLLUTION, PRICES, AND PUBLIC PROPERTY 85-91 (1975); Lahey, *supra* note 91, at 316.

121. Mills & White, *Government Policies Towards Automobile Emission Control*, in APPROACHES TO CONTROLLING AIR POLLUTION 348 (1978); Lahey, *supra* note 91, at 316; Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 CALIF. L. REV. 1259 (1981); Russell, *supra* note 119, at 187.

tank operations. For example, if environmentally sound tanker construction methods are followed, and if the oily ballast is pumped into inland holding ponds, there would be nominal pollution from operational discharges. The polluter that retains a ship with faulty construction, and purposefully discharges oily ballast into the ocean through routine operations such as cleaning, should be charged for each marginal unit of discharge. This would be difficult to determine without detailed records of oil cargoes and close surveillance of tankers. If, however, the amount of oil discharged was determined to be 1,000 barrels, then the polluter would be charged the cost of this pollution at a specified rate, perhaps \$20 per barrel. Unfortunately, this method is difficult to implement because of the problems of quantifying environmental damage.¹²² It would require estimates and subjective judgments of such damages.

Another method is to compare the costs of the preferred tanker construction and operations with the savings obtained through noncompliance and then assess a pollution charge equal to the savings. For example, it may cost \$10 per ton to convert a tanker for safer operation and to routinely discharge oily ballast into holding ponds, while a tanker firm that chose not to comply with these measures would have only a \$2 per ton cost of operations. Therefore, the charge for non-compliance could be based on the \$8 differential, with the noncomplying tanker firm then charged \$8 per ship per ton penalty for non-compliance.

This method is easier to implement, because figures could be arrived at to determine the basic differential to apply to different types of ships. The money collected from such charges could then be utilized to reimburse the governments internationally for special services related to enforcing the charge and for their support of construction of environmentally sound on-shore disposal facilities. These revenues also could be used to finance research in this area and in other ocean protection efforts. In essence, the charge is a payment for the use of the ocean, and should be applied towards correcting or improving its environment. This polluter-pays approach is currently used in many areas. For example, France uses it to maintain or improve water quality;¹²³ the United States uses it to finance environmental protection from oil spills due to off-shore drilling accidents;¹²⁴ and Japan uses charges to generate revenue to compensate victims of pollution.¹²⁵

122. Sagoff, *Economic Theory and Environmental Law*, 79 MICH. L. REV. 1393 (1981); Lahey, *supra* note 91, at 319.

123. ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT, POLLUTION CHARGES IN PRACTICE 22-30 (1980); Lahey, *supra* note 82, at 321.

124. See Offshore Oil Spill Pollution Fund, 43 U.S.C. §§ 1811-1824 (1982); Lahey, *supra* note 91, at 321.

125. Gresser, *The 1973 Japanese Law for the Compensation of Pollution Related Health Damage: An Introductory Assessment*, 5 ENVTL. L. REV. (1975); Lahey, *supra* note 91, at 322.

Alternative Options for Prevention of Oil Pollution

The United States and the world have a number of alternatives for reducing future oil pollution. Three options to be discussed here are elimination of flags of convenience, a system of economic charges to penalize polluters, and a program of monetary incentives to encourage controls. These alternatives are not mutually exclusive, and could be adopted in any combination. Whether implemented together or individually, each option would contribute substantially to preventing future oil discharges.

Elimination of Flags of Convenience

The termination of the use of flags of convenience will be costly to oil producers who currently rely on outdated tanker fleets. When poor crew and maintenance standards are no longer acceptable for any ship, then the level of competition will be altered. Firms that utilize modern fleets will no longer be forced to compete with ships with lower costs due to unsafe vessels and untrained crews. The nations previously benefiting from the present lax registration requirements will no longer be in the preferred situation to gain income with no corresponding gain in responsibility.

Countries like the United States have advantageously farmed out vessels as flag of convenience ships when they were in poor shape.¹²⁶ However, any country that did not take advantage of this opportunity was not realistically competing with others for the business served by such low-quality transportation. Elimination of the flag of convenience system will raise the lowest available costs of transportation, but this is an acceptable cost because it will simultaneously increase the quality of the transportation as ships are forced into compliance with new safety and environmental requirements.

A Fee System to Penalize Discharges

Oil pollution can be reduced significantly by the use of economic incentives to assure that polluters are motivated to change their practices. Tankers and other polluters should be required to pay in proportion to the oil pollution they cause. Incentives should be offered to companies to help overcome capital and other barriers to installation of equipment to prevent unnecessary discharges. A pollution fee would instill the system with a bottom-line economic discipline, while incentives link compliance with the economic well-being of the firm.

Implementation of a pollution charge system obviously requires a sys-

126. Note, *supra* note 33.

tem for monitoring the amounts of oil lost to the ocean on any given trip. Much of the needed framework and equipment for such monitoring is already available. There are well-established systems for gauging losses from tankers using Load-on-Top operation.¹²⁷ As a result of increasing use of this procedure, there has been substantial progress toward the development of reliable and reasonably accurate shipboard monitors.¹²⁸ Establishing a system of in-port inspections, which can be double-checked by auditing the transporter's oil record book, should provide a reasonably accurate monitoring record that can form the basis of a fee system.¹²⁹ While IMCO has no monitoring and enforcement at the present time,¹³⁰ the tools are available for these tasks.

With a reliable monitoring procedure in place, a fee system would simply impose a charge on each transporter per unit of oil discharged. The appropriate level of such a charge may require some trial and error, in setting a rate high enough to deter most oil pollution but not so high as to discourage the shipping of oil or unduly raise prices.¹³¹ International experience with similar fee systems has demonstrated their workability.¹³²

To be completely effective, a fee system would require international implementation. However, even acting alone, the United States could go far toward remedying oil pollution of the ocean. Dr. Mark Zacher, director of the Institute of International Relations at the University of British Columbia, emphasized recently that it "is now possible for the United States, as it was never possible for the United States in the past, to police the major pollution control procedure in its own ports. This is a very, very important step."¹³³ The United States imports approximately 25 percent of all foreign petroleum production, and all oil companies and tanker owners strongly desire access to the U.S. market.¹³⁴ Hence, even unilateral action by the United States could have a substantial world-wide impact on the oil pollution problem.

Even more important, the mere threat of unilateral U.S. action could induce development of an international regime of pollution charges. Past

127. Oil Tanker Pollution: Hearings Before the Subcomm. on Government Activities and Transportation of the House Comm. on Government Operations, 95th Cong., 2d Sess. 34-59 (1978) [hereinafter cited as Oil Tanker Pollution Hearings].

128. *Id.* at 110 (statement of William Gray, Exxon Corp.). Mr. Gray went on to suggest that the monitors at that time (1978) might not be adequate for precise monitoring of discharges. *Id.* Any such shortcomings, however, are primarily due to lack of pressure to perfect such devices, and an accurate monitor is within the reach of technology if resources are devoted to its development. *Id.* at 204 (testimony of Mark Zacher, University of British Columbia).

129. *Oil Tanker Pollution Hearings*, *supra* note 127.

130. *Id.* at 128 (testimony of Rear Adm. William Benkert, U.S. Coast Guard).

131. Roberts & Stewart, 88 HARV. L. REV. 1644, 1653 (1975).

132. A. KNEESE & C. SCHULTZE, *supra* note 120; ANDERSON ET. AL., ENVIRONMENTAL IMPROVEMENT THROUGH ECONOMIC INCENTIVES (1976).

133. *Id.*

134. J. HITE, *supra* note 106, at 104-07.

prospects of unilateral action by America have prompted some reforms by flag of convenience governments.¹³⁵ Tanker owners themselves will have an economic incentive to promote internationalization of any U.S. program, to avoid the costs of complying with different standards applicable to United States and non-United States importing.¹³⁶ Indeed, it has been suggested that the "threat of U.S. unilateral action has been the driving force for all recent IMCO actions."¹³⁷ Regardless of whether America's acts to control oil pollution prompt effective global responses, U.S. adoption of a charge system will itself ameliorate much of this growing problem. Another economic measure would entail a steep charge to all tankers that do not comply with certain preferred methods of pollution control. For example, this would make it economically attractive for the firm to adopt the practice of discharge into inland ponds.¹³⁸ The purpose of a charge is to assess the polluting firm for the burden imposed on society. Proponents of a charge system urge that it promotes efficient use of resources by forcing the user to pay for consumption of the environment; balancing the cost the polluter pays with the contribution he will be able to make; and not allowing a gain or profit at the expense of society's interest in the environment.¹³⁹

Incentives for Development of Reception Facilities

The international concern for insuring that the quality of the environment is protected necessitates action which will give immediate, measurable relief from oil pollution. Creation of inland reception/holding facilities is one recommendation that meets that demand. Even if no location is available at a particular port, an alternative to such land-based facilities is the use of decommissioned tankers as moveable holding ponds until more permanent facilities are established.¹⁴⁰ Previous international conventions have sought such reception facilities, yet subscribing nations did not follow through with implementing the recommendations.¹⁴¹ For example, Article VIII of the 1954 Convention provided that governments would insure the provision in each main port of facilities adequate for receiving residues from oily ballast water.¹⁴²

The procedure of pumping the oily ballast to shore facilities is technically possible and could prove profitable once implemented. The pro-

135. *Oil Tanker Pollution Hearings*, *supra* note 127, at 211.

136. *Id.* at 4 (statement of Rep. Burton).

137. *Id.* at 127 (testimony of Rear Adm. Benkert on reforms by the governments of Liberia, Panama, and others).

138. *Id.* at 201-02 (testimony of Dr. Zacher).

139. *Id.* at 4 (statement of Rep. Burton).

140. D. ABECASSIS, *supra* note 2, at 42.

141. *Id.* at 35.

142. *Id.* at 35, *citing* USA (Cmnd. 1677) and Liberia (Cmnd. 1806).

cedure has not been widely used, however, for three main reasons: 1) the high costs associated with installing inland shore systems; 2) the premium of dock space in harbors, and 3) the increased layover time necessary to discharge ballast in this manner. Nevertheless, the system is currently working efficiently for at least one major oil company that found layover time did not increase appreciably.¹⁴³ There are inevitable startup problems and learning costs, but these will contribute to routine, efficient, and less costly layovers over time. These costs should be subsidized by international governments because of the tremendous importance of insuring that the system be implemented.

To begin the implementation of sound procedures, special areas of environmental sensitivity should be targeted for action first. The areas targeted for the implementation of reception facilities should include the five regions identified in the MARPOL convention and adopted by the 1973 Intergovernmental Maritime Consultation conference on Marine Pollution—the Mediterranean Sea, the Baltic Sea, the Black Sea, the Red Sea, and the Arabian-Persian Gulf.¹⁴⁴ These areas are subject to heavy vessel traffic and exposed to great environmental risk. For this reason they are designated for rigid procedural safeguards and monitoring in an effort to prevent further degradation.¹⁴⁵ These efforts should be subsidized by international governments because of the global benefits from the oil transported through these areas.

After internationally subsidized set-up costs and learning curve costs are paid for, the holding pond system would be self-financed because the by-product of the system, the salvageable oil, would be valuable to the second user. The Maritime Administration Office of Intermodel Systems (MAOIS) has studied the issue and collected data concerning the requirements of ships in certain areas and the available port facilities.¹⁴⁶

Business firms would be encouraged to participate in such arrangements as a means of avoiding the type of pollution control legislation they have been confronted with in the past, the type that places the costs on business and subjects firms to heavy noncompliance penalties.¹⁴⁷ Business people have argued that most pollution control programs do not contribute positively to the shareholders' return on investment and, correspondingly, burden corporate resources and ultimately the public.¹⁴⁸ Subsidies are a

143. LEGAL, ECONOMIC, AND TECHNICAL ASPECTS, *supra* note 84, at 18-3.

144. K. HAKAPAI, MARINE POLLUTION IN INTERNATIONAL LAW: MATERIAL OBLIGATIONS AND JURISDICTIONS. EXCEPTIONALLY VULNERABLE SEA AREA: INTERNATIONAL ARRANGEMENTS 250 (1981).

145. *Id.* at 250-55.

146. LEGAL, ECONOMIC, AND TECHNICAL ASPECTS, *supra* note 84, at 18-3.

147. J. HITE, *supra* note 106, at 99.

148. *Id.* at 100; see SENATE COMM. ON PUBLIC WORKS, REPORT ON FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS AND CLEAN RIVER RESTORATION ACT OF 1966, S. REP. NO. 1367, 89th Cong., 2d Sess. 14 (1966).

method to help business overcome the initial capital investment needed for implementing pollution control.¹⁴⁹ However, continuous subsidies, especially those that favor investment in capital intensive pollution abatement or uneconomically high expenditures that provide limited benefits, are disadvantageous and may encourage inefficient forms of pollution control.¹⁵⁰ Learning from past experience, there is reason to believe that subsidies can be instrumental in funding the start-up of a program that will repay social dividends many times over the original investment.

ETHICAL CONSIDERATIONS

Efforts to balance the world's oil production and material well-being with environmental protection raise ethical issues of great significance. These issues are addressed, generally speaking, from two different perspectives. Utilitarians claim that the rightness of an act depends solely on its consequences. If it produces more public welfare or utility, that is, good consequences, than any other alternative, then it is ethical; otherwise, it is not.¹⁵¹ An opposing point of view, one that would sometimes support the same outcome but for different reasons, is not based on the consequences or utility of an act at all, but on a commitment to principle or to duty. This duty-based or deontological approach to ethical problems advances the proposition that if an act obeys a rule, then the act is right by virtue of obedience to the rule.¹⁵²

For example, Immanuel Kant advanced the proposition that we should act in such a way that a rational person would be willing to accept the basis of this action as a universal law.¹⁵³ In this context one would have to ask whether rational people could willingly embrace the prospect of everyone using the oceans as a receptacle for oil pollution. If the answer to this is no, then it is unethical to continue such a course of action. Further addressing this problem, the American philosopher John Rawls wrote that each generation should hand to the next a situation on which it has improved, just as it expected from the previous generation a situation on which it had improved:

[We should] ask what is reasonable for members of adjacent generations to expect of one another at each level of (historical) advance. They should try to piece together a just savings schedule by balancing how much at each stage (of history) they would be willing to save for their immediate descendants against what they would feel entitled to claim of their immediate predecessors. Thus imagining themselves

149. J. HITE, *supra* note 106, at 99.

150. *Id.* at 104-07.

151. D. LYONS, *FORMS AND LIMITS OF UTILITARIANISM* 3 (1965).

152. V. BARRY, *MORAL ISSUES IN BUSINESS* 52-54 (1979).

153. I. KANT, *GROUNDWORK OF THE METAPHYSICS OF MORALS* 70 (Paton trans. 1964).

to be parents, say, they are to ascertain how much they would set aside for their children by noting what they would believe themselves entitled to claim of their own parents.¹⁵⁴

This is not to say, of course, that utilitarians or deontologists would uniformly support the specific recommendations put forth in this article. On the other hand, these proposals are consistent with both of these schools of thought.

Given the utilitarian view, oil pollution is the down side of all the material gains, that is, public welfare or utility, that are made possible through the petroleum industry. But does this utility outweigh the disutility of destroying the oceans of the world, oceans that nurture life supporting food chains? While ethical inquiries of this sort will not support a particular legal or technological "fix," they at least lend credence to the balanced proposals of this article, proposals that instill environmental integrity into the continual flow of oil.

As for the deontologists' view, let us examine a rule that a one-dimensional man, economically-rational man would obey. Garret Hardin theorizes that the economic man will overexploit a resource without concern for conservation or pollution because it is in his material self-interest to do so, and if one person conserves others will merely exploit what has been conserved, since it is part of the "commons."¹⁵⁵ If this purely economic or free-market approach is followed, the oceans are likely to succumb to the effects of oil pollution. That is why market or economic rationality must be informed by ethical considerations. Whether a person is influenced by utilitarian concepts, or by deontological ones, there can be little question that the insights gained through ethical analysis will advance the type of solutions that are being posed.

CONCLUSION

The marine oil pollution problem can be attributed largely to two sources: the routine discharge of oil from ships during deballasting and tank washing after unloading tonnage, and oil spills. If these two sources of pollution are targeted, oil pollution will be reduced significantly.

In eliminating the problem of routine discharge from tank cleaning, it has been proposed that after a tanker has unloaded at its destination it be required to wash its tanks and discharge the wash water containing oil into environmentally sound inland disposal facilities. Because oil floats on water, it could then be skimmed off the top of the disposal pits and taken by truck to refineries. The proceeds from this oil sold to the refineries

154. J. RAWLS, *A THEORY OF JUSTICE* 189 (1971).

155. Kindt, *Prolegomenon to Marine Pollution and the Law of the Sea: An Overview of the Pollution Problem*, 11 *ENVTL. L.* 67 (1980).

could be used to support the skimming and trucking efforts. Setting up this type of system would be expensive, and should be subsidized by oil producing and shipping nations in proportion to their tonnage. After the system is operational, it could be self-supporting. Set-up costs could be raised through temporary levies on tankers and oil companies. Tankers also should be encouraged to utilize the Load-on-Top method and update their ships to avoid operational oil problems. A charge system is a feasible and appropriate enforcement mechanism to provide the incentive for such changes.

There is but one solution to the problem of oil spills, and that is the abolition of flags of convenience registry. The termination of flags of convenience would put an end to the causes of most oil spills—poorly trained crews and shoddy ship construction. Elimination of the less stringent safety standards under flags of convenience would greatly enhance a tanker's ability to make a voyage without running aground, colliding with objects or other ships, or losing oil because of structural failure.

These proposals, while subject to economic constraints, are at least an attempt to curb what in the last two decades has become an increasingly noticeable problem. Marine oil pollution has arisen as a very real concern among scientific circles. One writer puts it this way: "As ecologists have started to warn us, many environmental systems do not deteriorate gradually but, rather, are able to maintain the basic integrity of their character virtually until the point of collapse."¹⁵⁶ The amount of pollution the oceans can absorb is deceptive, and if marine oil pollution continues, the oceans will inevitably be rendered useless.

156. Falk, *Toward A World Order Respectful of the Global Ecosystem*, 1 ENVTL. AFF. 251, 252 (1971).