FLOATING NUCLEAR PLANTS—A "REASONABLE USE" OF THE HIGH SEAS?

MARLOWE J. BLAKE *

The capacity of various nations to navigate and fish the oceans has caused those nations to enter bilateral and multilateral agreements setting forth the rights and duties of each. As this capacity has developed throughout history, the rights of nations to use the ocean space have undergone diverse changes, giving rise to responsibilities not merely toward other individual nations, but to the international community as a whole. It is not simply by coincidence that the oceans have become the arena for such activity; the enormous value of the ocean as a food and navigation source has made it a natural entity through which nations could establish rules of order.

This article seeks to isolate factors, or patterns of behavior, which have evolved with respect to ocean uses. These patterns, then, can be utilized by the international community in evaluating its concern regarding any single nation's use of the ocean and in making the arguments necessary to articulate that concern. Specifically, this article will focus on an impending and controversial "use" of the high seas—floating nuclear plants.

I. THE FLOATING NUCLEAR PLANT CONCEPT

World energy needs have expanded commensurate with a rapid depletion of the earth's energy bearing natural resources. To accommodate present and future energy needs, the world's nations have been seeking and studying energy source alternatives. Nuclear energy is one such source.

In the United States, production of nuclear energy has been hampered by environmental, siting, and cost problems.[1] Partially as

* B.S.S., Pennsylvania State University; J.D. (1978), University of Miami School of Law; Articles and Notes Editor, LAWYER OF THE AMERICAS, *University of Miami Journal of International Law*; President, Environmental Law Society of the University of Miami.

1. *See* Selfridge, *Floating Nuclear Power Plants: A Fleet on the Horizon?*, 6 ENVT'L L. 791 (1976).

an attempt to avoid these problems, the idea of placing nuclear power plants on the ocean has gained serious consideration.[2] Because of their design concept, these plants have been called "floating nuclear plants" (FNP's).[3]

The FNP's physical plant is to be located approximately three miles off-shore[4] in water between forty-five and seventy feet deep.[5] It will be located within a breakwater having the width of three hundred feet at the bottom and fifty feet at the top.[6] The entire structure is intended to have the capacity to withstand sustained winds of 300 miles per hour, a collision with any supervessel afloat, and the greatest wave estimated to occur within the next ten thousand years.[7] The plant will be situated on a barge or group of barges 378 by 400 feet.[8] The barge is designed to rise and fall with the tides, and the plant will be moored to encasing physical structures, which will govern its mobility during tidal and other disruptions.[9] Present plans involve the siting of two plants within one breakwater.[10]

Electric power will be carried by cables buried in the seabed to shore-based transmission stations.[11] Recent technology would allow these lines to transmit electricity over 300 miles.[12] A 300 mile zone landward from the Atlantic coast should contain about forty-five percent of the United States population through 1990.[13]

On a cost comparative basis, FNP's are more economical than land based plants (LBP). Under Nuclear Regulatory Commission regulations, it is necessary to purchase a 400 to 500 acre site in or-

2. *Id.* at 791-92; *see, e.g.*, N.Y. Times, Apr. 2, 1976, at 65, col. 1.

3. *See* illustrations in Appendix A of this article *infra. See also* U.S. NUCLEAR REGULATORY COMMISSION, MANUFACTURE OF FLOATING NUCLEAR POWER PLANTS BY OFFSHORE POWER SYSTEMS, PART II—A GENERIC ENVIRONMENTAL STATEMENT (1976) [hereinafter cited as G.E.S.].

4. 1 Public Service Electric and Gas Company, Offshore Nuclear Generating Station Preliminary Concept and Site Description, 1-1-1-2 (October 1971) (unpublished) [hereinafter cited as Preliminary Concept].

5. G.E.S., *supra* note 3, at 3-1.

6. U.S. DEPT. OF COMMERCE (NOAA), REPORT TO THE CONGRESS ON OCEAN POLLUTION, OVER-FISHING AND OFFSHORE DEVELOPMENT, July 1973-June 1974, at 60 (1975).

7. *Id.*

8. *Offshore Marine Environmental Protection Act: Hearings on S.80 Before the Senate Comm'n. on Commerce*, 93d Cong., 1st Sess. 177 (1973).

9. Preliminary Concept, *supra* note 4, at 2-3.

10. G.E.S., *supra* note 3, at 3-1.

11. Preliminary Concept, *supra* note 4, at 2-6.

12. G.E.S., *supra* note 3, at 2-1.

13. *Id.*

der to build a land based plant.[14] Plant operation in high-density coastal population areas is less costly than in rural areas due to the need for fewer transmission lines. Nevertheless, land values in these areas have been rising dramatically.[15] FNP's require no such purchase. Furthermore, costs associated with federal regulations requiring construction permits for each plant,[16] due to varying land-site compositions, can be obviated by FNP's because of their relatively uniform site potentials. Standardization of the generating unit, allowing for mass production, will significantly cut manufacturing costs and streamline the process for the acquisition of construction permits.[17] The industry believes that off-shore siting will decrease local opposition, and thereby decrease the lengthy delay between the planning and operation stages usually associated with legal challenges.[18] Aside from the advantage of more reliable long range planning, FNP's are expected to save the utilities approximately seventy million dollars per plant as compared with LBP's.[19]

II. ENVIRONMENTAL CONCERNS

Presently, the world harvests approximately seventy million metric tons of ocean biomass.[20] Estimations are that if the ocean is to maintain its reproductive capacity for all marine life, no more than 94.34 million metric tons can be harvested.[21] Between 1950 and 1971, the world harvest increased seven percent per year, or at a rate which doubled every ten years.[22] With burgeoning populations and the development of more proficient fishing technologies, it is only a matter of time before the world harvest approaches that amount which will make reproduction impossible.

The ocean has been, and continues to be, inundated with oil, garbage, industrial wastes, and radio-active materials, posing a seri-

14. Selfridge, *supra* note 1, at 795.

15. *Id.*

16. Atomic Energy Act of 1954, § 185, 42 U.S.C. § 2235 (1970).

17. Selfridge, *supra* note 1, at 795-96.

18. *Id.*

19. Council on Envt'l Quality, Offshore Nuclear Power Plants 35 (1975) (available through the Council on Environmental Quality, Wash., D.C.) [hereinafter cited as C.E.Q. Rpt.].

20. U.S. DEPT. OF COMMERCE (NOAA), FISHERIES OF THE UNITED STATES, 1976, at 19 (1977). The 1976 world catch was 69,732,000 metric tons.

21. G. ROUNSEFELL, ECOLOGY, UTILIZATION AND MANAGEMENT OF MARINE FISHERIES 112-115 (1975).

22. *Id.* at 107 (Table 6-8), 108; *see also* A. GULLAND, THE FISH RESOURCES OF THE OCEAN ix (1971).

ous threat to the ocean's ecology.[23] In 1975, the United States alone accounted for about 87,826,362 cubic yards of dredge spoils, 3,346,000 tons of industrial wastes, and 5,039,000 tons of sewage sludge dumpings into the ocean.[24] Moreover, since 1946, the United States has deposited 86,758 containers of radio-active waste in the ocean.[25] These containers were estimated to decompose within approximately ten years as a result of their contact with the ocean's corrosive environment.[26] The alarming rate at which the world is both harvesting and polluting the ocean's resources renders critical any decision that will push the ocean's resources beyond their delicate reproductive balance.

Environmental hazards associated with FNP's can occur from accidents, plant construction and operation, terrorism, and war. Hypothetically, FNP accidents[27] can be caused by: natural phenomena such as storms, hurricanes, tornados, earthquakes, tsunamis and electrical storms;[28] vessel or airplane collisions with the breakwater, barge, or mooring;[29] vessel collisions with a barge carrying spent fuel from the power plant; fire breakouts aboard the power plant barge or fuel-transporting vessel; deterioration of important plant elements and damages from flying debris[30] caused by wave action and salt spray; power cable breakages caused by dragging anchors, or vessel groundings; sabotage or reactor meltdowns.[31]

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23. *See* Abrams, *The Environmental Problem of the Oceans: An International Stepchild of National Egotism*, 5 ENVT'L AFF. 3, 3-4, 7 (1976); Rogers, *Ocean Dumping*, 7 ENVT'L L. 1, 10 (1976).

24. *Ocean Dumping in the United States—1976*, 4 EPA ANN. REP. 1, 4 (1976); Rogers, *supra* note 23, at 2.

25. *Ocean Dumping of Waste Materials: Hearings on H.R. 285 (and others) Before Subcomm. on Fisheries and Wildlife Conservation and Subcomm. on Oceanography of the House Comm. on Merchant Marine and Fisheries*, 92d Cong., 1st Sess. 235 (1971).

26. Ezediaro, *Review of the Legal Aspects of International Water Pollution Control*, 17 How. L.J. 69, 84 (1971).

27. For an outline of possible major FNP accidents, *see* C.E.Q. Rept., *supra* note 19, at 49 (Table IV-1).

28. Although the same natural phenomena are experienced by both FNP's and LBP's, by virtue of its motion and reliance on a mooring system and breakwater for protection, the FNP is more vulnerable to naturally caused accidents. *Id.* at 51.

29. *Id.* at 46, 51. Between 1962 and 1972 there have been at least 11 major collisions between ships and large offshore structures in the Gulf of Mexico. *Id.* at 48, 49.

30. Ernest J. Effenberger, former employee for Offshore Power Systems, Jacksonville, Florida, testified before the Nuclear Regulatory Commission alleging that wave action could cause turbines to spin at excessive speed, causing metal to spin off and penetrate the plant's radioactive core. *See* N.Y. Times, June 16, 1976, at 83, col. 1.

31. C.E.Q. Rept., *supra* note 19, at 51, 55. There have been approximately 175 instances or threats of violence to power plants in the New York City vicinity since 1969, including

Plant construction, which includes transmission line dredging, has the direct environmental effect of destroying and displacing biological communities.[32] More pervasive, however, are the potential direct effects on flora and fauna mortality and behavioral patterns caused by plant operation. Each FNP will take in 1,030,000 gallons of cooling water per minute.[33] The temperature of the water will be raised 17.2 degrees Fahrenheit within 6.5 seconds. The water will then circulate through and be expelled from the plant within one minute.[34] The tremendous pressure of this flow will, as a matter of course, entrain certain relatively small sea creatures through the power system.[35] The larger sea life that cannot swim through the force of this flow may become impinged on the plant's screening system.[36] Moreover, the temperature increase in the surrounding waters can kill certain species either instantly or over a period of time.[37] Depending on the season and direction of tide flow, these thermal plumes can also disrupt the spawning, feeding, and migratory habits of the sea biota.[38]

Conversely, the existence of the breakwater, as an artificial reef, and the thermal pollution may attract certain species,[39] which

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several arson attempts and two cases involving the use of explosives. N.Y. Times, March 19, 1976, at 10, col. 4. For instance, three hijackers forced a pilot to circle the Oak Ridge, Tenn., atomic power facilities, and threatened to crash the plane into the facilities if demands were not met. N.Y. Times, Nov. 12, 1972, at 1, col. 8.

Theoretically, a reactor meltdown would occur from reactor coolant loss occasioned by a break in the plant's water-cooling system. The reactor core would reach high temperatures causing it to burn through the plant structures and into the plant environs.

The extent of radioactive contamination resulting from a FNP meltdown probably would be greater than that from a land-based occurrence. On land, the earth surrounding the reactor core would become glazed as the reactor burrows through the earth's crust. This glazing, in effect, would create an insulation chamber that could contain the contaminants. However, the reactor core in a FNP would melt through the barge and descend into the hydrosphere, possibly contaminating thousands of cubic miles of ocean. It has been estimated that contamination of the entire northwest Atlantic food chain for hundreds of years could occur from one meltdown. *See Commerce Comm'n. Hearings, supra* note 8, at 150, 151.

32. C.E.Q. Rept., *supra* note 19, at 73-77.

33. G.E.S., *supra* note 3, at 6-20.

34. *Id.*

35. *Id.* The assumed mortality effect of entrainment on all planktonic organisms is 100%.

36. *Id.* at 6-38. Through 1972 there have been at least 10 reported impingement fish kills resulting from land-based operations in estuarine areas. At one of these, the Surry Power Station in Virginia, approximately six million river herring were destroyed within two to three months. *Id.* at 6-40.

37. *See id.* at 6-52.

38. *Id.* at 6-57.

39. *Id.* at 6-57, 6-81.

will be in jeopardy of entrainment and impingement.[40] The attracted biota may also become entrapped in areas near the plant,[41] or suffer cold shock from temperature drops resulting from plant shutdowns.[42]

The effluent of radionuclides, chlorine, chromate, copper, and nickel are also expected to affect marine life in the vicinity of the plant.[43] These discharged chemicals and metals are used in the reactor cleaning process.[44] Cooling water emanating from the plant will exhibit low-level radiation counts.[45]

As a result of LBP operations, massive fish-kills have been attributed to thermal pollution, cold shock, nitrogen gas embolism, chlorine effluent, impingement, entrapment, and entrainment.[46] However, too little is known about the interrelationship among the ocean fauna and their distributions to predict exactly what short-term and long-term harm may result from FNP's.[47]

Combined with the multitude of accident possibilities and their ecological concomitants, the effects of FNP operation are sure to bear environmental costs. The dimensions of these costs can be perceived better when one understands that plant decommissioning, which creates its own environmental hazards, is expected to take place at the end of a plant's lifetime, which is estimated to be between thirty and forty years.[48] Additionally, it has been estimated that "in order to meet all of the power demands of the New Jersey area alone by the year 2000, it would be necessary to place a floating nuclear power plant every five miles along its coast."[49] Because of the lack of international quality control in FNP construction, and the potential for large numbers of FNP's to be situated on the ocean, the situation becomes even more ominous if FNP's were to be utilized by other nations.[50]

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40. *See* text accompanying notes 34-35 *supra*.

41. C.E.Q. Rept., *supra* note 19, at 77-78.

42. *See* G.E.S., *supra* note 19 at 6-57.

43. *See id.* at 6-61, 6-41-46.

44. *Id.*

45. *Id.*

46. C.E.Q. Rept., *supra* note 19, at 88-91. Fish kills caused by power plant discharges are difficult to document. Dead fish sink quickly or are eaten by scavengers. Many kills may not be reported. However, at least nine kills have been documented as relating to nuclear plant discharges. *Id.* at 91.

47. *See* G.E.S., *supra* note 3, at 6-20, 6-26.

48. *Id.*

49. Selfridge, *supra* note 1, at 838. Since the New Jersey coast is approximately 366 miles long, 73 FNP's would be required. *See* G.E.S., *supra* note 3, at 9-8.

50. With scarce unoccupied urban land areas and increasing resource prices, FNP's

III. INTERNATIONAL LAW

The last convention to address the reasonable use of the high seas was the 1958 Geneva Convention on the High Seas.[51] In essence, the Convention provided that all nations had the freedom to use the high seas for any purpose, so long as such use complied with its provisions, with other rules of international law, and that such freedom was exercised with "*reasonable regard* to the interests of other states in their exercise of the freedom of high seas."[52] The Third United Nations Conference on the Law of the Sea has produced similar qualifications respecting high seas freedoms. Article 87 of the Informal Composite Negotiating Text provides that the freedoms "shall be exercised . . . with due *consideration* for the interests of other States . . . ."[53] Since the genesis of the "reasonable regard" and "due consideration" limitations is fundamentally the same, discussion of the exercise of high seas freedoms in terms of whether FNP's constitute a "reasonable use" of the high seas is appropriate.

An analysis of the high seas status of FNP's, based on the possibility that they will be sited beyond a nation's three-mile territorial seas, would be short lived and incomprehensive.[54] It is clear

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may be well received by both developed and underdeveloped nations. Additionally, FNP mass-production techniques are conducive to foreign export. Off-shore Power Systems, Jacksonville, Florida has already received numerous sales requests from other nations.

51. *Done* Apr. 29, 1958, 13 U.S.T. 2313, T.I.A.S. No. 5200 [hereinafter cited as High Seas Convention].

52. The high seas being open to all nations, no State may validly purport to subject any part of them to its sovereignty. Freedom of the high seas is exercised under the conditions laid down by these articles and by the other rules of international law. It comprises, *inter alia*, both for coastal and non-coastal States:
(1) Freedom of navigation;
(2) Freedom of fishing;
(3) Freedom to lay submarine cables and pipelines;
(4) Freedom to fly over the high seas.
These freedoms, and others which are recognized by the general principles of international law, shall be exercised by all States with *reasonable regard* to the interests of other States in their exercise of the freedom of the high seas.

Id., art. 2 (emphasis added).

53. U.N. Doc. A/Conf. 62/WP.10 at 56 (1977) [hereinafter referred to and cited as Negotiating Text].

54. It is not a certainty that FNP's will be sited at or beyond the three-mile territorial water boundary. However, by locating without the three-mile limit, utilities may be able to take advantage of the limited liability for nuclear accidents provided under 42 U.S.C. § 2210(d)(e) (1970), which allows for coverage up to $100 million for accidents occurring in international waters, provided the utility enters into a service contract with the Commission. 42 U.S.C. § 2201(u)(1)(2)(a) (1970).

There also may be grounds for state jurisdiction in licensing FNP's for use beyond the three mile territorial limit. Under the submerged Lands Act, § 4, 43 U.S.C. 1312 (1976), both Texas and Florida have jurisdiction over the natural resources of the lands extending three

that a twelve-mile territorial sea limit is legal under customary principles of international law.[55] More important, however, is the fact that FNP's may deleteriously affect highly migratory,[56] anadromous[57] and catadromous[58] species whose migration patterns transgress territorial boundaries. Thus, this article will examine whether a coastal state's use of high seas resources,[59] that are affected by FNP construction and operation, will constitute a "reasonable use" of the high seas under international law.

The FNP concept, and its known as well as its unknown environmental effects, allows for the following assumption which is necessarily concomitant to an international legal analysis respecting the status of FNP's. The assumption is that FNP's will deplete the fishing stocks of highly migratory, anadromous and catadromous species through direct fish kills and, indirectly, through the interference with spawning and migratory patterns caused by entrainment, entrapment, impingment, cold shock, and chemical, thermal, and radiological pollution.

The purpose of this analysis, therefore, will be to juxtapose coastal states rights to exploit their territorial or internal waters, or any waters within a future exclusive economic zone, against the international community's fishing freedoms and fish resource needs. This article will not focus on the FNP concept as a coastal state's right to exploit its continental shelf. Under the 1958 Convention on

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marine leagues, or approximately nine miles, from their coastlines into the Gulf of Mexico. United States v. Louisiana, 364 U.S. 502 (1960). However, a problem with state jurisdiction under the Act is that "natural resources" is defined to include oil, gas and other minerals, but not water power or the use of water for power production, 43 U.S.C. § 1301(e) (1970). Since a primary advantage of FNP's is their use of ocean water for both plant cooling and steam generation, such use probably would be excluded from state jurisdiction as not being a use of a "natural resource" under the Act. Additionally, there should be no impediment to prosecution, within the United States, of those who may terrorize FNP's outside of the three-mile limit. International law allows prosecution against violators of a nation's health and safety if they perpetrate activities within a state's customs, sanitary, and health zone. Such zone extends to 12 miles from the coastal state. Finally, the Nuclear Regulatory Commission has not ruled out siting beyond the three mile limit. *See* G.E.S., *supra* note 3, at 12-55.

55. According to the Department of State's Geographer's 1975 Report, 56 nations have claimed 12 mile territorial seas. A three-mile limit, the next most numerously adopted, was claimed by only 30 nations. 1975 DEP'T STATE GEOG'S REP., *as cited in* G. KNIGHT, THE LAW OF THE SEA: CASES, DOCUMENTS & READINGS 329 (1977).

56. Tuna, whales and mackerals are examples of highly migratory species.

57. These are river-spawning, but ocean and river dwelling species. River salmon exemplify anadromous species.

58. These are ocean spawning, but river and ocean dwelling species.

59. A coastal state's use of high seas resources includes those fish that are not attached or confined to sea or river bottoms within the coastal state's territorial or internal waters, or on its continental shelf, and which meander outside of any state's territorial seas.

the Continental Shelf,[60] coastal states only have rights to explore and exploit nonliving natural resources of the seabed in addition to living organisms belonging to sedentary species.[61] Because ocean water is the only natural resource FNP's will exploit to produce energy, an examination of continental shelf rights is, therefore, irrelevant.

Simply, the issue is whether FNP's constitute a "reasonable" use of the high seas. This issue will be resolved by applying to the FNP concept the "reasonableness" criteria deduced from an examination of other uses which, although interfering with the complete freedom of sea use, impliedly have been considered reasonable by international acquiescence.

IV. REASONABLENESS IN INTERNATIONAL LAW

Confusion reigns over what constitutes "reasonableness" in the international arena. Some authorities have urged the use of the familiar nuisance test of balancing interests where precise rules of international law do not proscribe a particular activity having extraterritorial effects.[62] Under this view, where such precise international standards do exist, and a nation engages in activities which are proscribed by those standards, no balancing of interests need transpire. The rationale for that conclusion is that state conduct contravening internationally recognized norms is unlawful *per se*, and therefore, prima facie unreasonable.[63]

International law commentators,[64] and at least one judge,[65] have acknowledged the disparate thrusts of the balance and normative reasonableness tests. Yet, they have conditioned the applicability of the tests on a showing of harm.[66] The type of harm involved

60. Convention on the Continental Shelf, *done* Apr. 29, 1958, 15 U.S.T. 471, T.I.A.S. No. 5578, 499 U.N.T.S. 311.

61. *Id.* art. 2.

62. *See, e.g.*, L. OPPENHEIM, INTERNATIONAL LAW 345 (8th ed. Lautepacht 1955); Handl, *Balancing of Interests and International Liability for Pollution of International Watercourses: Customary Principles of Law Revisited*, [1975] CAN. Y.B. OF INT'L L. 156, 175.

63. Handl, *supra* note 62, at 162 n.22.

64. *See* Nanda, *The Establishment of International Standards for Transnational Environmental Injury*, 60 IA. L. REV. 1089, 1096 (1975); Handl, *Territorial Sovereignty and the Problem of Transnational Pollution*, 69 AM. J. INT'L L. 50 (1975).

65. *See* Australia v. France, [1973] I.C.J. 99, 131. (Ignacio-Pinto, J., dissenting)

66. *See* Third Report on State Responsibility, [1971] 2 Y.B. INT'L L. COMM'N 199, 223 (United Nations). Ago, the International Law Commission's Special Rapporteur, concluded that moral or material injury was the necessary consequence of every violation of an international right of a state, but economic injury was not a prerequisite for the determination of an internationally wrongful act. *Id. Compare* Judge Ignacio-Pinto's opinion, *supra* note 65.

can determine the proper reasonableness test. Thus, if a state suffers purely material or economic harm, the cause of the harm requires the balancing of the gravity of the harm with the utility of the harmful activity of the injuring state.[67] However, if a state suffers a breach of an internationally recognized right, such as a moral injury, it may be entitled to satisfaction regardless of the extent to which it may have suffered material damages.[68] Several international law cases are particularly relevant for determining which test should be utilized under varying factual contexts. In the *Trail Smelter Arbitration*,[69] the United States sued Canada on behalf of Washington State. Washington allegedly suffered timberland and agricultural damages as a result of air pollution emanating from a smelting concern located within Canada. An international tribunal presided over the matter and was to apply both United States and international law and practice, pursuant to the Convention entered into by the two countries.[70] The Tribunal awarded damages to the United States for the clearly proved timberland damages, and the line of property use and rental devaluation of some forty farms.[71] The Tribunal did not believe that a damage award to the United States for the "violation of sovereignty," for which the United States claimed it had incurred money expenditures,[72] was within its power to consider under the Convention.[73]

The importance of this case to international law and to this article revolves around the Tribunal's holding that

> under the principles of international law, as well as of the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another State or the properties or persons therein, when the cause is of serious consequence and the injury is established by clear and convincing evidence.[74]

To the extent that the Tribunal recognized that the consistency between international and United States law was limited to the law of

67. *See* Nunda, *supra* note 64, at 1109.

68. *See* text accompanying notes 62 and 63 *supra*.

69. (United States v. Canada) 3 R. Int'l Arb. Awards 1911 (1938); 33 AM. J. INT'L L. 182 (1939).

70. *Id.* at 1908; 33 AM. J. INT'L L. at 184.

71. *Id.* at 1926-27; 33 AM. J. INT'L L. at 200-01.

72. *Id.* at 1932; 33 AM. J. INT'L L. at 207.

73. *Id.* at 1932-33; 33 AM. J. INT'L L. at 207-08.

74. *Trail Smelter Arbitration* (United States v. Canada) 3 R. Int'l Arb. Awards 1938, 1965 (1941); 35 AM. J. INT'L L. 684, 716 (1941).

private nuisance,[75] it was assimilating the "balance of interests" concept into international law, as well as limiting its application to situations involving a territorial activity whose proximity with another state was such that it could cause serious injury therein.[76] Additionally, because the language of the holding addresses violations of territorial sovereignty, and the Tribunal was bound to assess only material damages,[77] the case should not be construed to preclude recovery solely for the breach of sovereignty.

A closely analogous case is the *Lake Lanoux Arbitration*.[78] That case involved a Spanish claim against France for violating Spain's legal right to an equal use of Lake Lanoux, which fed into Spain through its connection with the River Carol, pursuant to the Treaties of Bayonne to which both nations were signatories.[79] France made a unilateral decision to divert the waters of Lake Lanoux for the purpose of developing a hydro-electric plant.[80] Spain argued that this diversion breached several articles of the Treaties,[81] including article 12 which provided:

> The downstream lands are obliged to receive from the higher lands of the neighbouring country the waters which flow naturally therefrom together with what they carry without the hand of man having contributed thereto. There may be constructed neither a dam, nor any obstacle capable of harming the upper riparian owners, to whom it is likewise forbidden to do anything which might increase the burdens attached to the servitude of the downstream lands.[82]

The Tribunal found that Spain's true interpretation of article 12 was articulated in its counter memorial which stated:

> A state has the right to utilize unilaterally that part of a river which runs through it so far as such utilization is of a nature which will effect on the territory of another State only a limited amount of damage, a minimum of inconvenience, such as falls within what is implied by good neighbourliness.[83]

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75. *Id.* at 1950; 35 AM. J. INT'L L. at 699.

76. For an excellent analysis of the connection between the balancing test and neighboring states' responsibilities, *see* Handl, *supra* note 62, at 183-86.

77. *See* Handl, *supra* note 64, at 62.

78. Spain v. France, 24 I.L.R. 101 (Arbitral Trib. 1957).

79. *Id.*

80. *Id.* at 107.

81. *Id.* at 114.

82. *Id.* at 124.

83. *Id.*

The Tribunal's emphasis on this "good neighbourliness" formulation points to the applicability of the balancing of interests doctrine.[84]Because Spain had not attacked the French project with definitive proof of damage, but rather on the claim of a breach of its right to equal use of the waters of Lake Lanoux,[85] the Tribunal, in finding for France,[86]interpreted the rights conferred by the Treaties in light of the "spirit" of international law at the time of their making,[87] and confined the rights to a balancing of economic interests.

The *Corfu Channel*[88] and the *I'm Alone*[89] cases reflect a different thrust from the two cases discussed above. In *Corfu*, British naval units engaged in a mine-sweeping operation in Albanian waters were destroyed by mines.[90] The International Court of Justice found Albania liable to the United Kingdom for the damages sustained because Albania breached its international duty to warn ships of impending danger.[91] The Court also found the United Kingdom to be in breach of its international obligation not to violate a state's territorial waters.[92] However, the court also found that the United Kingdom's declaration that such violation amounted to a breach was "in itself appropriate satisfaction"[93] for the moral injury suffered by Albania.[94] In *I'm Alone*, the United States Coast Guard intentionally sank a ship of Canadian registry while in hot pursuit of that vessel for alleged smuggling operations on the high seas.[95] A commission formed pursuant to a Smuggling Convention,[96] entered into by the United States and Canada, found that the United States had used force in excess of that permitted under the Convention. It held that no compensation had to be paid in respect of the ship or cargo loss, but that the United States had to apologize and pay Canada twenty-five thousand dollars as a mate-

84. Handl, *supra* note 62, at 180.
85. Spain v. France, 24 I.L.R. 101, 116 (Arbitral Trib. 1957).
86. *Id.* at 119.
87. *Id.* at 121.
88. United Kingdom v. Albania, [1949] I.C.J. 4.
89. Canada v. United States, 7 Ann. Dig. 203 (Claims Comm'n 1933).
90. [1949] I.C.J. 4, 22.
91. *Id.*
92. *Id.* at 36. Operation Retail, the mine sweeping operation which constituted a violation of Albanian sovereignty, took place after the operation that caused the damage for which Albania was responsible.
93. *Id.* at 35.
94. *Id.*
95. Canada v. United States, 7 Ann. Dig. 203, 205 (Claims Comm'n 1933).
96. *Id.*

rial amendment[97] for the moral injury inflicted upon the Canadian government. Thus, in distinction to the *Trail Smelter* and *Lake Lanoux* Arbitrations, abrogations of international obligations occuring *outside* the territory of the harming state were recognized.

These four cases provide a rough demarcation of the various situations to which either the balance or normative tests of reasonableness should apply. The balance test applies where a relatively local dispute occurs between neighboring countries as a result of one nation's use, lawful *per se*, of its own territory to the harm of its neighbor. The normative test applies where the harmful conduct is caused by an activity performed extraterritorially, and, by virtue of that factor, to the derogation of an international obligation. For example, in *Corfu*, instead of weighing the relative interests of Albania and the United Kingdom when determining Albania's claim that its sovereignty had been violated, the Court compared the United Kingdom's claim of "innocent" passage with the internationally recognized norms related to such passage.[98]

The shortcomings of the formulations of the aforementioned commentators[99] become apparent in contexts which vary from these cases. A new use of the high seas, such as FNP's, immediately will confront the collective expectations of the world community; yet, the lawfulness of such use is undefined. According to the above formulations, FNP's exhibit characteristics which would make them subject to both, or possibly to neither, reasonableness tests. Clearly, a new and more inclusive approach must be developed.

Most systems of law depend upon the voluntary compliance of their adherents. Compliance, in turn, depends on the adherents' faith that their legal systems will fairly administer their rights. Such faith is engendered by the adherents' ability to perceive the fair administration of justice. This perception is most often accomplished by relating a tangible standard to the abstract concept of justice. The reasonableness standard enjoys widespread appeal for this purpose.

The international legal system is more sensitive toward voluntary compliance than municipal legal systems, primarily because it lacks enforcement power. Yet, it maintains cohesiveness by the sanction of community expectations. If one state persists in pushing its individual purposes beyond those of the community, then it

97. *Id.* at 206.
98. [1949] I.C.J. 4, 33-36.
99. *See* text accompanying notes 62-68 *supra*.

must expect that other nations will do the same. Such a situation would undermine the world's ability to equitably share in the resources or securities that are made available by common consent. Yet, if the world community is too stringent on individual states, its authority will be usurped by self interest.[100] Thus, the degree to which the authority of international law is jeopardized should govern which test of reasonableness applies.[101]

In the four cases analyzed *supra*, whether an activity was labeled "lawful *per se*" was insignificant.[102] A more fundamental consideration was the degree of importance attached to the fashioning of world behavior. In both *Trail Smelter* and *Lake Lanoux* the impact of the respective offenses was more local than regional or international. The dispute settling process was largely dictated by convention between the adverse parties. Moreover, the allegedly harmful activities were carried out within the territories of the harming states, and the harm in each case was suffered by one country. Thus, threats to world community expectations were minimal.

On the other hand, both the location and nature of the activities in the *Corfu Channel Case* and the *I'm Alone Arbitration* were highly offensive. Thus, they were more likely to create apprehension within other nations that their ability to enjoy secure borders and high seas navigation likewise could be infringed.

Because FNP's will deleteriously affect the epitome of international community property—the ocean—their use will excite and jeopardize world expectations. Unquestionably, their effect upon marine biota will transcend local boundaries. Thus, in order to be considered a reasonable use of the high seas, they must meet international norms.

V. INTERNATIONAL NORMS PERTAINING TO FREEDOM OF THE HIGH SEAS

The expectations of the world community regarding the factors to be weighed when making a "reasonableness" determination may be gleaned by analyzing several representative "uses" and "freedoms."[103]

100. *See* Lauterpacht, *Sovereignty Over Submarine Areas*, [1950] BRIT. Y.B. INT'L L. 376, 408.

101. *See* United States v. California, 332 U.S. 19, 35 (1947).

102. *See contra*, Handl, *supra* note 62, at 162, 193.

103. It would be redundant to evaluate every exception to the "absolute freedom of the

A. Nuclear Weapons Testing on the High Seas

Nuclear weapons testing began in July, 1946, at the Bikini Atoll in the Pacific Ocean.[104] In December, 1947, the Atomic Energy Commission selected Eniwetok Atoll which was near Bikini, but in the Marshall Islands, as a site for subsequent testing activities.[105]

During the 1946 Bikini tests, mariners were warned that the waters in an area of approximately 180,000 square miles surrounding the Atoll were dangerous and should be avoided.[106] Mariners were also warned of a 30,000 square mile area surrounding Eniwetok, once testing commenced.[107] In May, 1953, the Eniwetok area was expanded to 50,000 square miles, and in March, 1954, in contemplation of a detonation, to 400,000 square miles.[108] Then, on May 21, 1954, just fifty-seven days later, all warning zones were cancelled.[109]

Because of a gross underestimation of the March 1, 1954 blast, twenty-eight United States citizens and eighty-two Marshallese sustained minor injuries outside of the warning zone.[110] Serious injuries and one death were suffered by the twenty-seven man crew of a Japanese fishing craft that was apparently fourteen miles outside of the warning zone at the time of the explosion.[111] The Japanese fishing industry was also damaged to the extent that a large quantity of fish was condemned.[112] The United States, therefore, tendered the sum of $2 million dollars, *ex gratia*, to Japan as compensation for the injuries and damages sustained.[113]

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high seas." Therefore, the author has limited his examination to those activities whose international acceptance is representative of the other exceptions. For an excellent overview of the genesis of other exceptions, including the right of "hot pursuit"; enforcement of health, neutrality and customs regulations; fishing, navigation, and cable-laying, *see* 4 M. WHITEMAN, DIGEST OF INTERNATIONAL LAW 633-739 (1965). For specific treatment of two controversial freedoms, *see* Schuster, *Nuclear Ship Pollution: National and International Regulation and Liability*, 5 ENVT'L L. 203 (1975); Vysotsky, *Freedom of Scientific Research in the World Ocean*, 6 GA. J. INT'L & COMP. L. 7 (1976).

104. *See* McDougal and Schlei, *The Hydrogen Bomb Tests in Perspective: Lawful Measures for Security*, 64 YALE L.J. 648, 650 (1955).

105. *Id.* at 651.

106. *Id.*

107. *Id.*

108. *Id.*

109. *Id.* at 651-52.

110. *Id.* at 652.

111. *Id.*

112. *Id.*

113. *Id.* at 653.

The explosions were heavily criticized. One commentator, whose arguments fairly represented the anti-testing sentiment, believed that such testing violated the principle of freedom of the seas.[114] He reasoned that, aside from some very narrow exceptions, high seas freedoms are absolute.[115] The exceptions to high seas freedoms involve general and special police powers. General police powers were applied during peace time and were recognized by international custom. They included repression of piracy and hot pursuit. Special police powers, however, were binding only upon the signatories to a treaty[116] that created the special powers, and included fisheries control and submarine cable supervision. After examining examples of these two powers, the commentator concluded that neither could be found to justify the "fencing off from the maritime and air traffic of other nations hundreds of thousands of square miles of open sea and air space . . . ."[117] He found that, in addition to other infractions, the international law of fisheries had been violated by the cordon around the warning zones.[118]

There were others,[119] however, who defended United States nuclear testing on the high seas. They perceived that the public order of the high seas was a highly flexible decision-making process wherein the competing claims of individual states and world community interests would be weighed.[120] Essentially, the common order was maintained by "mutual tolerances . . . which create expectations that power will be restrained and exercised in certain uniformities of pattern."[121] The defenders, therefore, contended that the "ubiquitous" standard of reasonableness, rather than hardened rules, governed the analysis of nuclear testing.[122]

In order to isolate the historical factors that would justify nuclear testing, the commentators found parallel trends in the importance of fishing and navigation rights as they relate to community needs and the right of individual states to protect themselves.[123] They then analogized the security and safety functions of air de-

114. Margolis, *The Hydrogen Bomb Experiments and International Law*, 64 YALE L.J. 629, 635 (1955).
115. *Id.* at 634.
116. *Id.*
117. *Id.* at 635.
118. *Id.* at 640.
119. *See* McDougal, *supra* note 104.
120. *Id.* at 656.
121. *Id.* at 657.
122. *Id.* at 660.
123. *Id.* at 676.

fense zones[124] and sea room for defense maneuvers,[125] with the security and safety functions of nuclear testing and warning zones.[126] They further pointed out that, although primarily benefiting the defending nation, self defense aids the international community by ensuring world order.[127]

The factors which the commentators felt were most important in supporting the reasonableness of nuclear testing in the Pacific were that: 1) it was for the much honored world prescription of security; 2) by devising warning areas rather than enforcement zones, the United States asserted the least possible degree of authority; 3) the activity was limited, both in area and duration, to the minimum consistent with its purpose; 4) the area affected was of slight importance to international trade and fishing; and 5) the activity was performed within a crisis context.[128]

That the international community sanctioned United States nuclear high seas testing is evidenced by two events. The International Law Commission (ILC), in 1955, although not expressly proposing the freedom to undertake nuclear weapons tests, made that freedom subject to the condition that "[s]tates are bound to refrain from any acts which might adversely affect the use of the high seas by nationals of other states."[129] In effect, the ILC believed that such testing was permissible if substantial harm could be prevented. The second event occurred during the First United Nations Conference on the Law of the Sea. A proposal to include a new article prohibiting nuclear testing on the high seas, to follow article 27 of the 1956 ILC draft, was put forward by Czechoslovakia, Poland, the Soviet Union, and Yugoslavia.[130] An Indian proposal that the four-power proposal not be put to a vote was adopted by fifty-two votes to eight, with three absentions.[131] Based upon the factors enumerated above, it seems reasonable to infer that nuclear weapons testing was internationally sanctioned as a reasonable activity.[132]

The dispute over nuclear testing on the high seas has recently

124. *Id.* at 677.
125. *Id.* at 678.
126. *Id.*
127. *Id.* at 687.
128. *Id.* at 686.
129. [1956] 2 Y.B. INT'L L. COMM'N. 278.
130. 4 M. WHITEMAN, *supra* note 103, at 545.
131. *Id.*
132. *See* text accompanying note 146 *infra*.

been revived as a result of the *Nuclear Tests Cases*[133] concerning the legality of French detonations in the Pacific Ocean. Australia, as part of the basis of its claim, sought a declaration that French testing of nuclear weapons breached its right to be free from the violation of its territorial waters and air space by radioactive contaminants, and to the preservation of the regional environment from unjustified artificial radioactive contamination.[134] The International Court of Justice skirted these issues by finding that the primary purpose of the actions to prevent further atmospheric testing by France was mooted by French diplomatic signals indicating that such testing would cease.[135] Thus, the question of the legality of such testing was never addressed.

However, one commentator has argued that changes in the world milieu since the mid-1950's would be conducive to a finding of illegality.[136] Specifically, he points to growing environmental awareness and concern for radiological pollution as evidenced by various conventions and municipal enactments.[137] He suggests that the permissible water resource uses for recreation, aesthetics, public consumption, agriculture, industry, and navigation define what is or is not a "reasonable use."[138] Further, the advent and subsequent adoption by 106 states of the 1963 Nuclear Test Ban Treaty[139] indicates that such testing violates the thrust of customary international law.[140] Thus, he concludes that, with the current world's international perspective, nuclear testing is an unreasonable use of the high seas.[141]

B. The Cuban Blockade

In October 1962, the United States, believing the presence of nuclear missiles in Cuba posed a threat to its security, established a quarantine around the island to prevent the continued flow of such armaments into the area.[142] Commentators on the quarantine's le-

133. Australia v. France [1973] I.C.J. 99; Australia v. France, [1974] I.C.J. 253; New Zealand v. France [1974] I.C.J. 457.

134. *See* Australia v. France, [1974] I.C.J. 253, 427 (Barwick, J., dissenting).

135. *Id.* at 270-72.

136. Tiewul, *International Law and Nuclear Test Explosions on the High Seas*, 8 CORNELL INT'L L.J. 45 (1974).

137. *Id.* at 46, 49-55.

138. *Id.* at 48.

139. *Done* Aug. 5, 1963, 14 U.S.T. 1313, T.I.A.S. No. 5433, 480 U.N.T.S. 43.

140. Tiewul, *supra* note 136, at 56.

141. *Id.* at 68-69.

142. 47 DEP'T STATE BULL. 450 (1962).

gality have emphasized that the action was "a collective claim for a temporary and special use of limited areas of the high seas," since the Organization of American States agreed to help enforce and support the operation.[143] Further, they indicated that in the area of security there are many examples of "community acceptance" that one general customary principle of international law may limit the application of another.[144] Thus, they concluded that a restriction on the free use of the high seas is a "reasonable use" if grounded on valid peace, security, and self-defense bases, and is necessary and proportional to the threat.[145]

C. Deepwater Ports

These ports, which will be situated on the high seas, will be used primarily for cargo loading and unloading.[146] They may interfere directly with navigation because of the nature of their location, or indirectly because the coastal state will regulate the shipping traffic in the areas surrounding the facility.[147] Moreover, the possibility of oil pollution resulting from increased traffic or collision between ships and ports may also interfere indirectly with navigation. A United States official emphasized that both a restrained regulatory approach and the strong probability that a properly located facility would "enhance" navigation, would allow deepwater ports to gain international recognition as a "reasonable use" of the high seas.[148]

D. The Freedom of Fishing

Fishing rights have paralleled closely the historic permutations of the freedom of the seas. Thus, it is both appropriate and necessary to observe how the two have interacted in order to understand what the freedom to fish currently means. Most important, however, is that such an examination will help to determine whether FNP interference with fishing rights is unreasonable according to international law. It is submitted that rights regarding freedom of

143. Christol and Davis, *Maritime Quarantine: The Naval Interdiction of Offensive Weapons and Associated Materiél to Cuba, 1962*, 57 AM. J. INT'L L. 525, 528-30 (1963).

144. *Id.* at 540.

145. *Id.*

146. *Offshore Ports and Terminals: Hearings on H.R. 5091 Before the House Comm. on Merchant Marine and Fisheries*, 93d Cong., 1st Sess. 1-3 (1973) (opening remarks by Chairman).

147. *Id.* at 71 (statement of John Morton Moore).

148. *Id.* at 70.

the seas have had an economic underpinning throughout history. In its present-day form, this economic logic instills an affirmative duty on coastal states to preserve fisheries for the benefit of the world community.

The freedom of the seas doctrine developed at a time when international competition for fisheries was minimal.[149] During the second century, Roman thought established that free sea use was common to all mankind.[150] This "common property" concept was codified in the Digest of Justinian during the Sixth Century.[151] Medieval Europe, however, witnessed an increasing supply and demand for fish.[152] Higher rates of fish consumption increased international contact among fishing fleets.[153] Fuedal law caused the transfer of common property rights to the king. Because some nations had a comparative advantage over others in both exploiting and enforcing rules pertaining to varying expanses of water off their coasts, the advantaged nations began to exclude other nations from fishing in those waters.[154]

During the late sixteenth and early seventeenth centuries, technological conditions lowered the cost of searching for and obtaining ocean resources. In addition, the trend toward closing territorial seas to foreign use was enhanced both by technological accomplishments and by the fact that such closure stimulated shipbuilding industries.[155] Nations began to justify such territorial seas on proprietary grounds. Apologists for King James I, for example, scoured historical documents and concluded that, based on a proclamation of Edward II dated 1299, the King could exercise feudal rights in the sea.[156] Likewise Spain and Portugal made grandiose claims to a monopoly over navigation and commerce within the oceans leading to the New World and East Indies on the pretext that they were the first to chart, discover, and occupy the pathways to those regions.[157]

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149. Clarkson, *International Law, U.S. Seabeds Policy and Ocean Resource Development*, 17 J. L. & ECON. 117, 119 (1974).

150. P. FENN, THE ORIGINS OF THE RIGHT OF FISHERY IN TERRITORIAL WATERS 3 (1926).

151. *Id.* at 6.

152. T. FULTON, THE SOVEREIGNTY OF THE SEA 57-60 (1977).

153. Clarkson, *supra* note 149, at 119.

154. *Id.* at 120.

155. *Id.*

156. O'Connell, *The Juridical Nature of the Territorial Sea*, [1971] BRIT. Y.B. INT'L L. 303, 305-06.

157. FULTON, *supra* note 152, at 338-39.

In response to these claims, Hugo Grotius promulgated his treatise, *Mare Liberum*.[158] His argument was essentially premised on property rights. Because the ocean was like the sun or air, and not subject to physical possession or ownership, it was a gift from God to all mankind.[159] One of the essential attributes of this type of common property, according to Grotius, was that, although it could serve one person, still it would suffice for the common use of all other persons.[160] In this sense, the sea was distinguishable from wild animals or fish, both of which could be subject to possession. Yet, in accordance with this natural law reference frame, Grotius argued that "fencing off with stakes an inlet of the sea [to] make a fish pond . . ."[161] could be justified because the enclosed inlet would be within a nation's boundaries. He further stated, however, that to establish such a claim outside of an inlet could not be justified, "for then the common use of the sea might be hindered."[162] As a result of these arguments, the doctrine of *res nullius* became the law of the day with respect to all but narrow strips of territorial waters.[163]

Implicit in Grotius' arguments were two important assumptions. The first suggested that the rewards, to his Dutch homeland in particular and to the world in general, of exclusive rights were insufficient to offset the costs of obtaining and enforcing those rights.[164] The second assumption embraced the notion that the wealth of the ocean was inexhaustible and, thus, unlike property which was exhaustible unless carefully managed, not subject to national claims.[165]

The underlying logic of Grotius' first assumption caused many nineteenth century maritime nations, including Spain and Great Britain, to become the new exponents of *mare liberum*.[166] Yet, this same philosophy, accompanied by advancing technology, created conditions which undercut his second notion that the seas' resources were inexhaustible. The many conflicts which arose over fishing rights to previously plentiful, but now overfished, fishing

158. H. GROTIUS, THE FREEDOM OF THE SEAS (R. Magoffin trans. 1916).
159. *Id.* at 7-10, 22-44.
160. *Id.*
161. *Id.*
162. *Id.*
163. Clarkson, *supra* note 149, at 122. The doctrine of *res nullius* refers to property without ownership subject to possession by appropriation.
164. *Id.*
165. F. CHRISTY, THE COMMON WEALTH IN OCEAN FISHERIES 179 (1965).
166. Clarkson, *supra* note 149, at 122.

grounds caused nations both to call once again for expanded territorial seas and to enter multilateral agreements addressing these conflicts.[167]

In 1945, President Truman ushered in a new era of ocean policy with his Proclamation establishing a conservation zone in areas contiguous to the United States coast.[168] This was done to protect fisheries which were being rapidly and indiscriminately depleted by technologically sophisticated fishing methods.[169] This zone was to extend twelve miles off the coast, which was nine miles into the high seas.[170] The Proclamation, however, was carefully drafted to safeguard other states' interests in the regulated fisheries.[171] This clearly manifested the United States intention to exercise jurisdiction with respect to fishing by its nationals for the purpose of conservation, without affecting the freedom of the nationals of the other fishing nations within the conservation zone.[172]

It is important to note that the ILC justified this approach by adopting draft articles relating to the conservation of the living resources of the high seas.[173] The preamble declared that

> [t]he primary objective of conservation . . . is to obtain the optimum sustainable yield so as to obtain a maximum supply of food and other marine products in a form useful to mankind . . . .[174]

Several commentators supported the extension of jurisdiction by defining it as a conservation rather than a monopoly measure.[175] Such measures were seen to be reasonable in light of the "requirements of economic life and scientific progress."[176]

The Proclamation, and accompanying international sanction, raised the inference that when a state seeks to protect the economic[177]and health interests of its people from a tangible evil, it

167. *Id. See also* FULTON, *supra* note 152, at 566-69, 604-49, 693-740.

168. Proclamation No. 2667, Policy of the United States with Respect to Coastal Fisheries in Certain Areas of the High Seas, 59 Stat. 1945; 3 C.F.R. 67 (1948).

169. II Foreign Rel. U.S. 1496-99 (1945).

170. *Id.*

171. *Id. See also* Proclamation No. 2667, *Policy of the United States with Respect to Coastal Fisheries in Certain Areas of the High Seas*, 59 Stat. 1945; 3 C.F.R. 67 (1948).

172. *See* Lauterpacht, *supra* note 100, at 407-08.

173. [1956] 2 Y.B. INT'L L. COMM'N 286.

174. *Id.* at 287.

175. *See* U.N. Secretariat, Regime of the High Seas, U.N. Doc. No. A/CN.4/32, at 36078 (1950).

176. *See* Lauterpacht, *supra* note 100, at 403.

177. A state's right to interfere with high seas navigation and fishing, based upon its economic necessities, was bolstered by the *Fisheries Jurisdiction Case* (United Kingdom v.

can interfere with the absolute free use of the seas if its approach is commensurate with the evil perceived;[178] if it will serve the needs of the world community; and if it will not constitute an act of sovereignty. Moreover, the Proclamation marked the point at which fisheries conservation became an integral part of oceans policy.[179]

Both the 1958 High Seas Convention[180] and the Convention on Fishing and the Conservation of the Living Resources of the High Seas[181] increased coastal states' hegemony over their territorial seas and contiguous waters. However, the sovereign rights conferred over the fisheries resources of the territorial seas could not be exercised as easily as resources on the land. F.V. Garcia-Amador was one of the first commentators to describe the problem. He recognized that, except for those resources under or connected to the sea's bottom, living resources could migrate outside of the territorial sea. Thus, he urged that, whenever such migration occurred, the concept of ownership ceased to apply and the resources would be governed by the regime of the high seas.[182]

The question today has become whether such resources, while within the nation's territorial or internal waters, can be considered high seas resources. The Negotiating Text,[183] which contains the working provisions of the Third United Nations Conference on the Law of the Sea, is an excellent indicator of customary international law.

Article 2 of the Negotiating Text provides that "sovereignty over the territorial sea is exercised subject to the present Convention and to *other rules of international law*."[184] Textually this article is very similar to article 2 in the 1958 Convention on the Territorial Sea and Contiguous Zone.[185] The International Law Commission, in its 1956 Commentary on the draft of this article, indicated that

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Iceland) [1974] I.C.J. 3, 34 (where Iceland was granted preferential fishing rights in a 12-mile to 50-mile zone seaward of its coast, because of its special economic dependance on the zone's fisheries).

178. *See* McDougal, *supra* note 104, at 670. Discussion indicates that the international community, although not commenting on the Proclamation, took exception to claims which were not proportional to the needs of the claiming nations.

179. Clarkson, *supra* note 149, at 124.

180. *See* High Seas Convention, *supra* note 51.

181. *Done* Apr. 29, 1958, 17 U.S.T. 138, T.I.A.S. No. 5969, 559 U.N.T.S. 285 [hereinafter cited as Living Resources Convention].

182. F. GARCIA-AMADOR, THE EXPLOITATION AND CONSERVATION OF THE RESOURCES OF THE SEA 22-24 (1959).

183. Negotiating Text, *supra* note 53, at 21.

184. Negotiating Text, *supra* note 53, at 21 (emphasis added).

185. *Done* Apr. 29, 1958, 15 U.S.T. 1606, T.I.A.S. No. 5639, 516 U.N.T.S. 205.

the sovereign rights of a coastal state over its territorial sea were tantamount to those rights the state could exercise over other parts of its territory.[186] Thus, it is arguable that a customary principle has developed holding that rules of international law that apply to or limit a coastal state's exercise of authority over its territorial sea are equally applicable to a state's exercise of authority over its land and internal waters.

It has been argued that the "freedom to fish" has been significantly curtailed by the advent of the 200-mile exclusive economic zone (EEC) concept.[187] Article 56 (1)(a) of the Negotiating Text provides that in the EEZ, the coastal state has "sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living. . . ."[188] Fisheries are included as living natural resources over which coastal states have sovereignty.[189] Furthermore, the Negotiating Text seems to exclude fishing from its list of rights and duties of other states in the EEZ.[190] Article 87, which lists freedoms of the high seas, includes the freedom to fish.[191] However, article 86, to which article 87 is subject, provides that all of the high seas articles do not apply to parts of the sea within the EEZ.[192]Nevertheless, article 58 does al-

186. [1956] 2 Y.B. INT'L L. COMM'N 265.

187. *See* Clingan, *Emerging Law of the Sea: The Economic Zone Dilemma*, 14 SAN DIEGO L. REV. 530, 539-40, 542 (1977).

188. Negotiating Text, *supra* note 53, at 41.

189. *Id.*

190. Article 58(1) provides:

> In the exclusive economic zone, all States, whether coastal or land-locked, enjoy, subject to the relevant provisions of the present Convention, the freedoms referred to in article 87 of navigation and overflight and of the laying of submarine cables and pipelines, and other internationally lawful uses of the sea related to these freedoms such as those associated with the operation of ships, aircraft and submarine cables and pipelines and compatible with the other provisions of the present Convention.

Id. at 42.

191. Article 87 provides:

> The high seas are open to all States, whether coastal or land-locked. Freedom of the high seas is exercised under the conditions laid down by the present Convention and by other rules of international law. It comprises, *inter alia*, both for coastal and land-locked States:
>
> . . . .
>
> (e) Freedom of fishing, subject to the conditions laid down in section 2.

Id. at 56.

192. Article 86 provides:

> The provisions of this Part apply to all parts of the sea that are not included in the exclusive economic zone, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State. This article does not entail any abridgement of the freedoms enjoyed by all States in the exclusive economic zone in accordance with article 58.

Id.

low international lawful use of the sea related to the freedom of navigation, associated with the operation of ships, and "compatible with other provisions of the present convention."[193] Fishing, of course, could be included within those qualifications.[194] Furthermore, article 62(2) obligates coastal states to give other states access to the surplus of allowable catch which the former cannot harvest.[195] Article 69 gives land-locked nations the right to exploit the living resources of the EEZ of adjoining coastal states on an equitable basis.[196] These explicit provisions support the contention that at least limited fishing rights exist within the EEZ.

Several rules of international law respecting fisheries conservation have evolved which limit coastal state sovereignty over fisheries within the EEZ. One is that the world's fisheries should be harvested in such a manner as to promote the optimum exploitation of fisheries resources.[197] The optimum exploitation of fisheries amounts to establishing a conservation scheme that will ensure the ocean's capacity to produce the maximum sustainable yield of fisheries resources.[198] The maximum sustainable yield concept developed in response to the "tendency of a common property resource, such as a fishery, to become depleted . . ."[199] in the absence of any economic restraints on fishing efforts. The maximum sustainable yield concept essentially provides that when levels of fish-

193. *Id.* at 42.

194. Clingan, *supra* note 187, at 543.

195. Article 62(2) provides:

> 2. The coastal State shall determine its capacity to harvest the living resources of the exclusive economic zone. Where the coastal State does not have the capacity to harvest the entire allowable catch, it shall, through agreements or other arrangements and pursuant to the terms, conditions and regulations referred to in paragraph 4, give other States access to the surplus of the allowable catch.

Negotiating Text, *supra* note 53, at 45.

196. Article 69 provides:

> 1. Land-locked States shall have the right to participate in the exploitation of the living resources of the exclusive economic zones of adjoining coastal States on an equitable basis, taking into account the relevant economic and geographical circumstances of all the States concerned. The terms and conditions of such participation shall be determined by the States concerned through bilateral, subregional or regional agreements. Developed land-locked States shall, however, be entitled to exercise their rights only within the exclusive economic zones of adjoining developed coastal States.
>
> 2. This article is subject to the provisions of articles 61 and 62.
>
> 3. Paragraph 1 is without prejudice to arrangements agreed upon in regions where the coastal States may grant to land-locked States of the same region equal or preferential rights for the exploitation of the living resources in the exclusive economic zones.

Id. at 48.

197. Living Resources Convention, *supra* note 181, art. 2.

198. *Id. See also* Negotiating Text, *supra* note 53, art. 61, at 44.

199. CHRISTY, *supra* note 165, at 9.

ing effort are low the catch will be low, while the population, reproduction, and natural mortality will be high. For higher levels of effort, there will be higher sustainable yields and lower populations until a population reaches the point at which the sustainable yield is at a maximum.[200] Individual users of a common property resource usually are in competition with one another to appropriate as large a share of the resource as possible. They will not unilaterally restrain their efforts because that would put them at a competitive disadvantage. Because there has been no limit on the number of countries or persons exploiting the world's fisheries, producers have entered and will continue to enter the fishing industry until it becomes unprofitable to do so. The unprofitability point is reached when the total cost of producing the fish becomes greater than the total product of the fishing effort. This point is reached when fish are being caught at higher levels than can support the maximum sustainable yield.[201] Born out of a fear of fishery depletion, the maximum sustainable yield concept has conditioned the world's expectations of fisheries conservation.

The trend toward attaining maximum sustainable yield sparked the development of legal regimes designed to provide conservation incentives to both the coastal states and the international community. In the process, the world has readopted a property rights approach toward establishing ocean rights. However, these rights are founded neither on a country's first claim to certain ocean space, nor on the arbitrary and haphazard establishment of territorial seas at varying distances. Rather, the world is recognizing, and thereby conferring, property rights in coastal states that allow them the "first-crack" at the fisheries within their territorial seas and proposed 200-mile EEZ's.[202] This will give the coastal state the incentive to conserve such fisheries.[203] The international community, on the other hand, is given residuary rights to the fish which the coastal states cannot harvest.[204] These residuary rights are in ex-

200. *Id.* at 8.

201. *Id.* at 7-8.

202. *See* Negotiating Text, *supra* note 53, arts. 56(1)(a) & 61(1), at 41, 44.

203. *See* CHRISTY, *supra* note 165, at 183-84.

204. *See* Negotiating Text, *supra* note 53, arts. 56(2), at 41, 61(3), at 44 & 62(1), at 44. Article 56(2) provides that "the coastal State shall have due regard to the rights and duties of other States . . ." when exercising its rights within the EEZ. *Id.; see also* art. 62(2), *supra* note 195.

The term "exclusive economic zone" should not be construed literally. The Negotiating Text specifically provides for the aid of other states in preserving the marine environment within the coastal state's EEZ, and the right to utilize those resources which are beyond the

change for the world community's agreement to forego using the ocean's resources as community property. In that sense, the world's present approach is one that is consistent with the Abstention Doctrine.

The Abstention Doctrine asserts that states which have invested time, effort, and money, and have restrained production of fisheries stocks for the purpose of increasing their populations and insuring their existence, should have the exclusive use of those stocks to the extent that they are fully utilized.[205] Implicit in this full utilization qualification is that stocks, which are not so utilized, can be used to benefit the abstaining nations.

The Bering Sea Fur Seal Convention[206] exemplified both the abstention principle and the residuary rights which flow to the abstainers. Under this convention, Russia and the United States were managers of the resource and operated as agents for the convention's parties. Fur seals could be captured only on their breeding islands, and not on the high seas where capture was inefficient. The United States and Russia invested only the effort necessary to effect the maximum sustainable yield from the herds. The returns, then, were split with other signatory nations who were, in a sense, being compensated for giving up their right to take the seals in international waters.[207]

The requirement that the coastal state conserve fish in the proposed EEZ and negotiate with other fishing states for the rights to the fish which the coastal state will not harvest,[208] indicates the present acceptability of the Abstention Doctrine. Yet, it also reaffirms the coastal state's duty regarding fishery conservation for the world community. Without the reasonable expectation that they will share in the bounty made available by conservation efforts, the world's fishing nations will not abstain from exploiting high seas fisheries.

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coastal state's capacity to harvest. *Id.* art. 62(2)(3), at 45. Additionally, the International Court of Justice in the *Fisheries Jurisdiction* case seems to have affirmed the right of other states to exploit the resources of a zone which has been denominated "exclusive" by the coastal state. *See* United Kingdom of Great Britain and Northern Ireland v. Iceland, [1974] I.C.J. 3, 29; *examined in* Fleisher, *The Right to a 200-mile Exclusive Economic Zone or a Special Fishery Zone*, 14 SAN DIEGO L. REV. 548, 575 (1977). The United States position is that with the establishment of an EEZ, prior rights of other states in the zone are to be recognized. Clarkson, *supra* note 149, at 127.

205. *See* CHRISTY, *supra* note 165, at 173, 187.

206. Bering Sea Fur Convention, *signed* July 7, 1911, 37 Stat. 1542, T.S. No. 564.

207. CHRISTY, *supra* note 165, at 158.

208. Art. 62(2), *supra* note 195.

That coastal states have an affirmative duty to preserve and conserve fisheries for the international community under international law has been expressed in the Living Resources Convention[209] and the Negotiating Text.[210]

The Living Resources Convention states that "[a]ll States have the *duty* to adopt, or to cooperate with other States in adopting, such measures . . . necessary for the conservation of the living resources of the high seas."[211] The Negotiating Text requires that states "shall" agree upon conservation and development measures for fishing stocks within the EEZ's of two or more nations, or in a nation's EEZ and an adjacent area beyond that zone where other nations fish.[212] Thus, there is international recognition of a duty of coastal states to conserve rather than deplete the stocks of fish in which other nations have an interest. The Negotiating Text further requires coastal states, and states whose nationals fish highly migratory species, to ensure the conservation and optimum utilization of such stocks both within and beyond the EEZ.[213] Moreover, coastal states are required to conserve anadromous and catadromous species[214] with an interest toward minimizing economic dislocations within other states that harvest such fish.[215] The coastal state or

209. Living Resources Convention, *supra* note 181, art. 1(1)(2).

210. *See* Negotiating Text, *supra* note 53, art. 61(1)-(5), at 44.

211. Living Resources Convention, *supra* note 181, art. 1(2) (emphasis added).

212. Article 63 provides:

1. Where the same stock or stocks of associated species occur within the exclusive economic zones of two or more coastal States, these States shall seek either directly or through appropriate subregional or regional organizations to agree upon the measures necessary to co-ordinate and ensure the conservation and development of such stocks without prejudice to the other provisions of this part.

2. Where the same stock or stocks of associated species occur both within the exclusive zone and in an area beyond and adjacent to the zone, the coastal State and the States fishing for such stocks in the adjacent area shall seek either directly or through appropriate subregional or regional organizations to agree upon the measures necessary for the conservation of these stocks in the adjacent area.

Negotiating Text, *supra* note 53, at 46.

213. This requirement is contained in art. 64(1) which provides:

1. The coastal State and other States whose nationals fish in the region for the highly migratory species listed in annex I shall co-operate directly or through appropriate international organizations with a view to ensuring conservation and promoting the objective of optimum utilization of such species throughout the region, both within and beyond the exclusive economic zone. In regions where no appropriate international organization exists, the coastal State and other States whose nationals harvest these species in the region shall co-operate to establish such an organization and participate in its work.

Id.

214. *See* notes 56 and 57 *supra* . Both of these species reside within the internal waters of coastal states during certain periods.

215. Article 66 provides:

1. States in whose rivers anadromous stocks originate shall have the primary interest in and responsibility for such stocks.

state of origin also is required to consult with other nations fishing the stocks before it establishes fishing regulations, and to ensure the ingress and egress of migrating fish.[216] Likewise, the coastal state is required to consider fishing patterns when establishing conservation measures.[217] Lastly, "[s]tates have an *obligation* to protect and

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2. The State of origin of anadromous stocks shall ensure their conservation by the establishment of appropriate regulatory measures for fishing in all waters landwards of the outer limits of its exclusive economic zone and for fishing provided for in subparagraph (b) of paragraph 3. The State of origin may, after consultation with other States fishing these stocks, establish total allowable catches for stocks originating in its rivers.

3. (a) Fisheries for anadromous stocks shall be conducted only in the waters landwards of the outer limits of exclusive economic zones, except in cases where this provision would result in economic dislocation for a State other than the State of origin.

(b) The State of origin shall co-operate in minimizing economic dislocation in such other States fishing these stocks, taking into account the normal catch and the mode of operations of such States, and all the areas in which such fishing has occurred.

(c) States referred to in subparagraph (b), participating by agreement with the State of origin in measures to renew anadromous stocks, particularly by expenditures for that purpose, shall be given special consideration by the State of origin in the harvesting of stocks originating in its rivers.

(d) Enforcement of regulations regarding anadromous stocks beyond the exclusive economic zone shall be by agreement between the State of origin and the other States concerned.

4. In cases where anadromous stocks migrate into or through the waters landwards of the outer limits of the exclusive economic zone of a State other than the State of origin, such State shall co-operate with the State of origin with regard to the conservation and management of such stocks.

5. The State of origin of anadromous stocks and other States fishing these stocks shall make arrangements for the implementation of the provisions of this article, where appropriate, through regional organizations.

Article 67 provides:

1. A coastal State in whose waters catadromous species spend the greater part of their life cycle shall have responsibility for the management of these species and shall ensure the ingress and egress of migrating fish.

2. Harvesting of catadromous species shall be conducted only in waters in respect of which the State mentioned in paragraph 1 exercises sovereign rights over the living resources and, when conducted in the exclusive economic zone, shall be subject to the provisions of the present Convention concerning fishing in the zone.

3. In cases where catadromous fish migrate through the waters of another State or States, whether as juvenile or maturing fish, the management, including harvesting, of such fish shall be regulated by agreement between the State mentioned in paragraph 1 and the State or States concerned. Such agreement shall ensure the rational management of the species and take into account the responsibilities of the State mentioned in paragraph 1 for the maintenance of these species.

Negotiating Text, *supra* note 53, at 47-48.

216. *Id.*

217. 3. Such measures shall also be designed to maintain or restore populations of harvested species at levels which can produce the maximum sustainable yield, as qualified by relevant environmental and economic factors, including the economic needs of coastal fishing communities and the special requirements of developing countries, and taking into account fishing patterns, the interdependence of stocks and any generally recommended subregional, regional or global minimum standards.

Id. art. 61(3), at 44.

preserve the marine environment."[218] States must take all necessary measures to prevent, reduce, and control marine pollution damage both to other states and to areas beyond those over which they exercise sovereign rights.[219] Pollution of the marine environment is defined as

> [t]he introduction by man, directly or indirectly of substances or *energy* into the marine environment (*including estuaries*) which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, *including fishing* and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities.[220]

Thus, an international obligation exists for the purpose of protecting the freedom to fish from the interference of marine pollution.

The world has consistently defined the freedom to fish in terms of its ability to harvest a continuing supply of fisheries resources. Yet, because it is presently possible for various nations to enforce territorial claims over vast expanses of ocean space, and because fisheries stocks are no longer considered inexhaustible, a *mare clausum*[221] world is conceivable. However, since such expansion will effectively deny the land-locked, geographically disadvantaged, non-fishing, and other fishing nations access to fisheries resources, the international community is seeking to diminish such broadening claims.[222] A further international goal is to ensure a replenishing supply of such resources to reach the goal of optimum utilization of the fisheries.[223] The goal of optimum utilization can be realized in two ways; either directly through fishing efforts, or

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218. *Id.* art. 193, at 107 (emphasis added).

219. 1. States shall take all necessary measures consistent with the present Convention to prevent, reduce and control pollution of the marine environment from any source using for this purpose the best practicable means at their disposal and in accordance with their capabilities, individually or jointly as appropriate, and they shall endeavour to harmonize their policies in this connexion.

2. States shall take all necessary measures to ensure that activities under their jurisdiction or control are so conducted that they do not cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with the present Convention.

3. The measures taken pursuant to this Chapter shall deal with all sources of pollution of the marine environment. . . .

Id. art. 195(1)(2).

220. *Id.* art. I, 1 (4), at 20 (emphasis added).

221. *Mare Clausum* stands for the argument posited by John Selden in 1635 that the sea was capable of being privately appropriated. FULTON, *supra* note 152, at 370-74.

222. Fleischer, *supra* note 204, at 553-55.

223. *Id.* at 557-58.

indirectly through the negotiation for harvested and processed fish nutrients. To this extent and in this context, the freedom of fishing persists. The indirect method is contingent upon successful negotiations. Yet, if a nation's nutritional and/or economic needs cannot be met through negotiation, especially where the unsatisfied nation had previously depended upon harvesting fish in the EEZ, its only recourse may be to fish once again in that area. Consequently, the world has been spinning an increasingly complex web of both conventional and customary international law that has created incentives, rights, duties, and expectations for all nations.

The willingness of fishing states to abstain from fishing certain species for the purpose of providing an incentive to coastal states to conserve those species is tied intricately to the expectation that benefits will flow from the conservation effort. These expected benefits, or residual rights, create a duty in coastal states to ensure, to their greatest ability, that certain species remain available for the international community. Thus, highly migratory, anadromous and catadromous species must be considered "high seas" resources, even when located in territorial or international waters. Indeed, the language of the Negotiating Text permits no other conclusion.[224]

These expectations and duties take on a particular complexion when evaluated in terms of the international obligations of all states to preserve the marine environment.[225] The fishing rights of all nations must be considered before nations can introduce pollution substances or energy into the marine environment, including estuaries (which are internal waters). Thus, the reasonableness of a pollution source, such as FNP's, must be gauged with reference to this intricate network of international expectations that are precariously seeking to prevent the division of the ocean into totally exclusive territorial blocks. These international expectations are both linked together and reinforced by the logic of private property rights and the goal of optimum exploitation of the world's fisheries resources.

224. *See* text accompanying notes 212-220 *supra*. The fact that the United States has limited its exclusive fishery management authority over highly migratory species further supports the contention that they are high seas resources according to the principles of customary international law. *See* The Fishery Conservation and Management Act of 1976, Pub. L. No. 94-265, §§ 2, 103, 90 Stat. 331 (1976) (to be codified in 16 U.S.C. § 1801, § 1813).

225. *See* High Seas Convention, *supra* note 51, arts. 24 & 25; United Nations Conference on Human Environment, held at Stockholm, 27 U.N. GAOR (2112th plen. mtg.) 21, U.N. Doc. A/PV. 2112 (1972) *as cited in* J. BARROS & D. JOHNSTON, THE INTERNATIONAL LAW OF POLLUTION 31 (1974); Negotiating Text, *supra* note 53, arts. 193-238.

VI. FNP's AND INTERNATIONAL NORMS

FNP exploitation of high seas fisheries resources cuts against the grain of present world fisheries conservation expectations. Essentially, a distinction between fisheries and nonfisheries "uses" has been engendered by the world community's expectation that it share in those fisheries resources that coastal states cannot harvest. Because FNP's constitute a "use" of resources for non-fisheries purposes, the incentive structure of present customary and conventional law will be undermined by the effects of FNP's on fisheries. Moreover, because the pollution effects of FNP's will interfere with the fishing rights of other nations, a state's utilization of FNP's will abrogate the international obligation to prevent, reduce, and control such interference. The regulatory approach by the Nuclear Regulatory Commission epitomizes the lack of attention given to this international obligation.

In assessing the environmental effects of FNP's, the Nuclear Regulatory Commission analyzed the effects of individual plants at eight potential locations throughout the United States.[226] Yet, nowhere in its analysis did it attempt to ascertain the cumulative effects that FNP pollution would have when compounded by the known effects caused by other pollution sources. More importantly, the Commission failed to consider what effects FNP pollution might have on the international fishing industry.

The duties to conserve fish with the aim of optimizing world exploitation and to permit the ingress and egress of high seas resources, such as anadromous, catadromous, and highly migratory species, would be hindered by FNP construction and operation just as greatly as if fishing nets and barricades were implanted some distance from a coastal state. Yet, it is obvious that certain ocean activities which have deleterious effects on fisheries stocks will be considered reasonable. Thus, the extent to which international expectations will be jeopardized must be evaluated in light of other normative factors.

A. Security

FNP's can aid indirectly the United States defensive and security posture by decreasing American dependence on foreign energy products which are necessary for munitions production and functioning. Likewise, they could prevent the possibility of political

226. G.E.S., *supra* note 3, at xii.

blackmail by the oil exporting nations, in addition to maintaining the United States economy. Arguably, the world community could reap technological benefits, in addition to the advantages it could gain from a more secure and economically healthy America.

Alternatively, the current need for FNP's is not as great as the need was for a strong United States military capability during the Cold War years. Nuclear testing on the high seas was necessary for the United States because, unlike the Soviet Union, there were no large unpopulated land masses on which to test. Today, however, reasonable energy alternatives to FNP's, from conservation through geothermal energy systems, exist.

Yet, as fisheries resources decline and the world's demand for food increases, competition for such dwindling resources enhances the opportunities for conflict. The exploitation of such resources for purposes other than as a food source will come under increasing verbal, and possibly physical, attack. Moreover, as the fear of over-exploitation and diminishing fisheries stocks increases, nations will tend to advance unilateral claims to greater expanses of ocean space; a tendency which also increases the chances of conflict. It is doubtful that, in the long run, the FNP concept will offer any great security advantage to the world community. It is more likely that they will undermine the present world thrust toward maintaining regimes that emphasize conservation efforts in order to impede the very conflicts that the FNP's engender.

B. Duration and Qualitative Use

Although the pollution effects of nuclear testing on the high seas were incalcuable, it was widely felt that the danger to human life, both from entering into and eating the fish harvested from the testing areas, was minimal within a matter of three to four months. Likewise, the interference with high seas fishing by the Cuban Blockade was tolerated by the world, partially because the appropriation of ocean space was limited in time to several weeks. Yet FNP's are expected to operate for the lifespan of the plants, approximately forty years. Thus, FNP's will constitute a long-term, if not permanent,[227] direct pollution source affecting the high seas resources. The radiological pollution alone, notwithstanding the length of time the plants are actually in operation, may perma-

227. The permanency of FNP's will depend upon the ability to safely decommission them.

nently affect fisheries species' ability to procreate or to serve as an edible food source both to human beings and other life forms that depend on the ocean for sustenance. The ultimate damage to the sensitive and sophisticated world food chain is not presently calculable.

The qualitative effects of FNP use are also distinguishable from those attributed to the Truman Proclamation and deep water ports. The Proclamation was sanctioned by the international community as a conservation measure, primarily because it posed no threat to ocean space appropriation or resource destruction. Deepwater port operation is expected to improve navigation, with only a slight limitation on the use of ocean space by other nations. Resource destruction is expected to be minimal and only as the *indirect* result of increased shipping quantities attracted by the ports. Yet FNP's will constitute not only a spatial appropriation, however reasonable, but an appropriation of resources through *direct* and long-term pollution effects.

FNP's, in contrast to other uses of the high seas, will interfere with fishing freedoms for a far greater length of time. Furthermore, FNP's will detrimentally affect fishing rights to an extent beyond that tolerated by other permanent uses. Therefore, when measured against the durational and qualitative effects of other uses of the high seas on international fishing rights, FNP's must be considered unreasonable according to international law.

VII. CONCLUSION

The primary problem in determining the "reasonableness" of floating nuclear plants is the paucity of documented information concerning the effects of pollution on fishing stocks. For this reason, the Nuclear Regulatory Commission did not try to ascertain what the cumulative effects of FNP's and other contributing sources of pollution would have on fish distribution. Nor was the effect of FNP pollution upon the international fishing industry considered.[228] This lack of scientific information, along with the anticipated pollution effects of FNP's, has led to this article's assumption that fish stocks, in which the international community has an interest, will be affected adversely by FNP operation. Yet the demand for fisheries is increasing, and the rate at which fisheries are being harvested suggests that the use of the ocean's resources by FNP

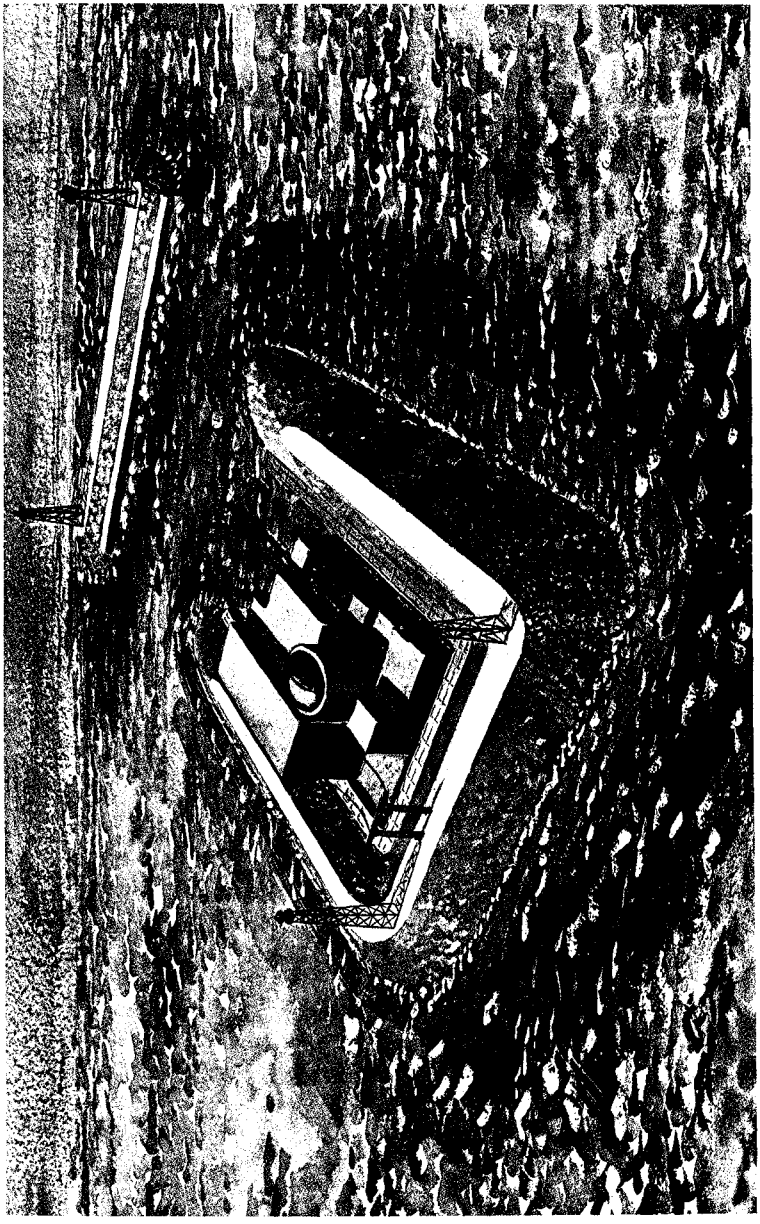
228. *See* G.E.S., *supra* note 3, at 6-20, 6-26.

operation would be unreasonable because of that lack of information.

The necessity of ensuring a continuing food supply from the ocean, world security, and the life of the world's oceans, which, incidentally, supply nearly seventy percent of the earth's oxygen, has been the underlying impetus for the movement towards international conservation. This movement has generated a rationalized scheme of attributing private property rights to areas of the ocean. The theory of an inexhaustible ocean no longer conforms to fact. For the United Nations Conference on the Law of the Sea to produce a new treaty, the international community must realize that the oceans are precariously finite. Notwithstanding this outcome, it is essential, not only for the enhancement of the quality of life for the world's citizens, but also for the survival of humankind, that the test of reasonableness embodied in the High Seas Convention, and the other customary legal concepts discussed in this article, be expanded to meet such environmental dangers as those presented by the floating nuclear power plant concept.

APPENDIX "A"

Illustrations from 1 Public Service and Electric Gas Company, Offshore Nuclear Generating Station Preliminary Concept and Site Description (1971).



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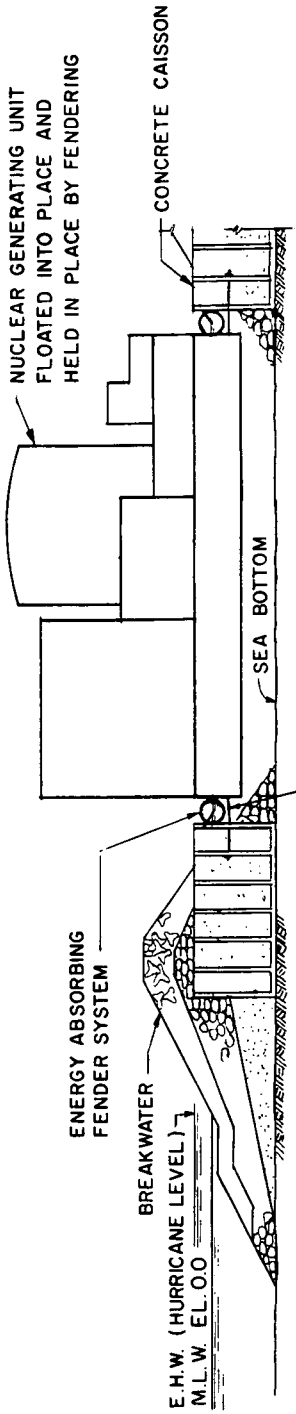
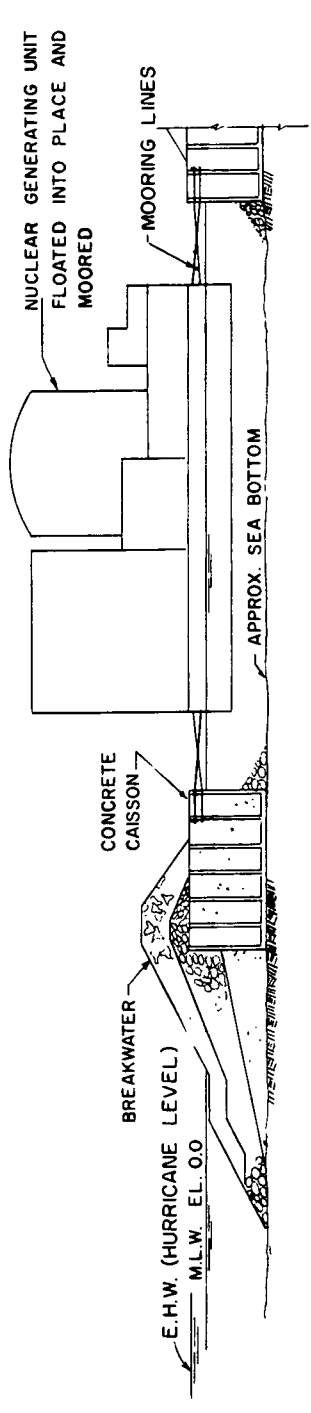


FNPP CROSS SECTION DISPLAYING ENERGY ABSORBING FENDER SYSTEM (ABOVE) AND MOORING LINE CONCEPT (BELOW).



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