Nuclear Testing Rocks the Sub-Continent: Can International Law Halt the Impending Nuclear Conflict between India and Pakistan

Grant Guthrie
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BY GRANT GUTHRIE*

I. Introduction

The 1998 nuclear tests by India and Pakistan have created concern that the historic conflict over Kashmir might suddenly boil over into a full scale war.1 The Kashmir conflict and the current effort by India and Pakistan to build nuclear arsenals are deeply intertwined.

Directly after the 1998 Indian nuclear tests, Indian Home Minister L.K. Avani admonished the Pakistani government to “roll back its anti-India policy with regard to Kashmir,” and that further Pakistani support for the Kashmiri militants would be “futile and costly” for Pakistan.2 “The long-standing and ever-unfolding conflict between India and Pakistan” over the fate of Kashmir “has consistently provided dangerous opportunities for violent engagement.”3 In light of the recent activation of each nations’ nuclear weapons program, an arms race could ensue and, even worse, a possible nuclear exchange could occur. Movement towards the resolution of this conflict is essential because it is the principle cause

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of hostility between India and Pakistan. Unfortunately, "the lengthy diplomatic record concerning Kashmir... has been... a record of failure." 

Pakistan is unlikely to scale down its nuclear efforts unless it has guarantees that India will do the same. "India claims that it must maintain and develop its nuclear capabilities to deter China," its other nuclear neighbor, from making territorial encroachments in Northern India. India further maintains that the anti-proliferation regime instituted by the international community is inequitable because it prohibits non-nuclear nations from attaining nuclear technology while allowing nuclear nations to retain their nuclear weapons. There is no easy solution to this pressing problem and something must be done before it's too late.

This note investigates the relationship between the testing and development of nuclear weapons with international law. Two aspects of international law that prohibit future testing and development of nuclear weapons are examined. First, this note determines if a prohibition against nuclear testing and development has been elevated into the corpus of customary international law through previous treaties and actions of the international community. Second, the implied prohibition against nuclear testing and development contained in traditional and recently created customary international environmental law is investigated and evaluated.

II. Historic Conflict in Kashmir

The fate of Kashmir has been in dispute since 1947. The conflict in Kashmir mainly involves issues of territorial aggrandizement. However, religion also plays an enormous role in shaping the conflict's dynamics. From 1858 until 1947, The Indian subcontinent was a colony of England. British India consisted of 9 provinces and 584 princely
states. The provinces were under the total control of the English Crown. The princely states retained their internal sovereignty, although their external affairs were governed by England.

When the British left, they Partitioned their former empire into the states of India and Pakistan. The arbitrary creation of separate countries out of what was historically one country caused great upheaval. Pakistan viewed this event as its chance to break away from the mainland. India viewed the same event as an unsubstantiated division of its territory. From that moment forward, India and Pakistan had irreconcilable political objectives.

The British plan for withdrawal did not determine the political or geographic dispositions of the semi-independent princely states. The princely states were granted total independence by England and allowed to determine their own future. India and Pakistan adopted different positions on the independence of the princely states. India thought that the princely states were falsely granted independence and desired to annex them. Pakistan thought that the states were correctly given independence, but also wanted to annex them. Most princely states could not survive on their own and eventually chose to become part of India or Pakistan. Only three important states managed to retain their autonomy. Kashmir was one of these states.

Three major religions were represented in Kashmir. There were Buddhists, Hindus and Muslims. The Muslims were the

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11. See id.
12. See id.
13. See id. at 505.
15. See Khan, supra note 9, at 505.
16. See id.
17. See id.
18. See id.
19. See id.
20. See id. at 505-06.
21. See id. at 496, 506.
22. See id.
23. See id. at 507.
24. See id.
25. See id.
26. See id. at 496.
27. See id.
majority. The population of Pakistan was predominantly Muslim. Based on Kashmir's dominant Muslim population, Pakistan asserted a religious claim to Kashmir's territory.

In August 1947, an invasion by Pakistani forces and an uprising among Kashmiri Muslims compelled Kashmir's ruler to seek the assistance of India. India agreed to fend off the hostile forces only if Kashmir surrendered its autonomy and became part of India. Kashmir agreed to India's terms with the condition that it could keep its own constitution. India then sent troops to engage the Pakistanis. The Indian troops were successful and the Pakistanis were driven back to the western third of Kashmir.

Subsequently, India and Pakistan fought three intense, but brief wars over control of Kashmir. The last war was fought in 1971 and an armistice followed. Nothing was resolved. The current situation in Kashmir continues to pose a serious threat to peace and security in the region. Indian and Pakistani troops exchange artillery fire in Kashmir on a daily basis, even despite the 1971 armistice agreement. The ongoing development of nuclear weapons and acquisition of ballistic missile technology add urgency to the resolution of the Kashmir conflict.

III. Nuclear Conflict: India & Pakistan

A. India's Nuclear Program

India first tested a nuclear device in 1974. It was a fission device and it measured 12 kilotons. The device relied on plutonium as its

28. See id.
29. See id.
30. See Gupta, supra note 14, at 111-14, 122-23.
31. See id. at 122.
32. See id.
33. See id. at 126.
34. See Khan, supra note 9, at 508-09.
35. See St. John, supra note 3, at 174.
36. See id.
37. See id.
38. See id.
39. See Ayesha Khan, Pakistan Joins the Club, BULL. ATOM. SCIENTISTS, July/Aug. 1998, at 34.
source of fuel and it was detonated underground. The Indian government described the test as a peaceful explosion. Some nations were outraged by India’s actions and either completely stopped the transfer of nuclear technologies to India or continued transferring technology only with special assurances. Since 1974, the Indian nuclear weapons program appeared to be dormant.

In May 1998, India surprised the international community by conducting five more underground nuclear tests. These tests were held at the Pokhran test range, a desert site located 350 miles southwest of New Delhi. The devices tested at Pokhran were a thermonuclear device with a yield of 43 kilotons and four fission devices with yields ranging between 12 and 0.2 kilotons. These devices used plutonium as their source of fuel.

Immediately after these tests, the Indian government announced to the world that the testing had achieved two goals. First, the tests showed that India was capable of creating a wide-range of nuclear weapons. Second, the tests allowed India to update their 1974 weapon design. The Indian government also announced to the world that it would place a moratorium on any further nuclear testing.

Currently, India has many aircraft capable of carrying nuclear devices. India has a reliable intermediate-range ballistic missile and is developing a long-range ballistic missile. India is also developing

41. See David Albright & Mark Hibbs, India’s Silent Bomb, BULL. ATOM. SCIENTISTS, September 1992, at 2.
42. See Khan, supra note 39, at 35.
43. See Gary Milhollin, Stopping the Indian Bomb, 81 AM. J. INT’L L. 593, 596 (1987) (Canada completely suspended all nuclear cooperation with India as a result of the 1974 India nuclear test. The United States continued nuclear cooperation with India on the condition that India would only pursue “peaceful” uses of nuclear technology).
44. See Albright, supra note 40, at 21.
45. See id.
46. See id.
47. See id.
48. See id. at 22.
49. See id.
50. See id.
51. See id. at 21.
submarines and sea-to-surface missile technologies.\textsuperscript{54}  
India’s capacity to produce weapon-grade plutonium has been developed for over thirty-five years.\textsuperscript{55} Taking into account the fuel output of Indian reactors, some experts have estimated that India had 370 kilograms of weapon-grade plutonium in 1997.\textsuperscript{56} At five kilograms of plutonium per warhead, India could already possess up to seventy-four nuclear weapons.\textsuperscript{57}

\textbf{B. Pakistan’s Nuclear Program}

Despite admonishments from the international community, Pakistan responded to India’s nuclear tests with nuclear tests of its own. Eleven days after India’s tests, Pakistan detonated five nuclear devices.\textsuperscript{58} They were all underground explosions and were carried out in the southwestern region of Pakistan.\textsuperscript{59} The yield of the largest explosion was 30-35 kilotons and the other tests were a variety of small, low-yield explosions.\textsuperscript{60} The Pakistani government stated that all the devices were either fission devices or boosted fission devices.\textsuperscript{61} It further indicated that Pakistan could construct a thermonuclear device given the time and resources.\textsuperscript{62}

The Pakistani government stated that there were two objectives to its nuclear tests.\textsuperscript{63} First, the tests were meant to deter India from using military force against Pakistan.\textsuperscript{64} Second, the tests generated scientific data that will make Pakistani nuclear weapons more effective in the future.\textsuperscript{65}

Before the tests, Pakistan probably could only have produced a large, antiquated nuclear device and delivered it by attack aircraft. Now, Pakistan will be able to design a smaller nuclear device and deliver it on a missile.\textsuperscript{66} This innovation coincides with Pakistan’s

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\textsuperscript{54} See Norris & Arkin, supra note 52, at 71.
\textsuperscript{55} See Albright, supra note 40, at 24.
\textsuperscript{56} See id. at 34.
\textsuperscript{57} See id.
\textsuperscript{58} See David Albright, Pakistan: The Other Shoe Drops, BULL. ATOM. SCIENTISTS, July/Aug. 1998, at 24.
\textsuperscript{59} See id.
\textsuperscript{60} See id. at 24-25.
\textsuperscript{61} See id.
\textsuperscript{62} See id.
\textsuperscript{63} See id.
\textsuperscript{64} See id. at 24.
\textsuperscript{65} See id. at 25.
\textsuperscript{66} See id.
\end{flushleft}
recent unveiling of a reliable intermediate-range ballistic missile.\textsuperscript{67}

Considerable uncertainty surrounds how much weapon-grade uranium Pakistan possesses. Pakistan broke a 1991 nuclear fuel moratorium and restarted full-scale production of weapon-grade uranium shortly before its recent bout of testing.\textsuperscript{68} Experts have estimated that Pakistan is in possession of 335-400 kilograms of weapon-grade uranium.\textsuperscript{69} If Pakistan uses 20 kilograms of weapon-grade uranium per warhead, it could possess between 16-20 nuclear weapons.\textsuperscript{70}

C. Global Results of Continued Nuclear Testing

In light of Indian nuclear superiority, Pakistan may perceive an imbalance of power. Coupled with the seriousness of the Kashmir conflict, Pakistan may attempt to develop its nuclear program. Future nuclear testing will likely occur. India may increase its nuclear arsenal in an attempt to maintain its nuclear advantage over Pakistan and an arms race could result. An arms race will produce grave environmental harm and political instability in the region and throughout the world.

1. Environmental Effects of Nuclear Testing

It is well established that residual nuclear radiation is an inescapable side effect of nuclear tests.\textsuperscript{71} This radiation is very difficult to contain, even despite the most stringent of precautionary measures.\textsuperscript{72} At least 1,950 nuclear tests have been carried out since 1945.\textsuperscript{73} Testing can be carried out in space, in the air, on the earth’s surface, under water or underground. To date, it is reported that approximately 1,420 underground tests have been conducted in different parts of the world.\textsuperscript{74}

\textsuperscript{67} See Kotch & Sidhu, supra note 53, at 44.
\textsuperscript{68} See Albright, supra note 58, at 25.
\textsuperscript{69} See id.
\textsuperscript{70} See id.
\textsuperscript{71} For a discussion on the effects of nuclear explosions, see Legality of the Threat or Use of Nuclear Weapons, 35 I.L.M. 814, 886-95 (1996) (dissenting opinion of Judge Weeramantry); id. at 863-64 (dissenting opinion of Judge Shahabuddineen); id. at 928-30 (dissenting opinion of Judge Koroma) [hereinafter Nuclear Weapons Opinion].
\textsuperscript{73} See id.
\textsuperscript{74} See id.
After the initial detonation, underground tests entail the risk of instantaneous leaks of short-lived and long-lived radioactive isotopes to the ground, water and air. Underground tests also may cause long-term environmental harm if the test site is disturbed at a later date. For example, changes to the structural integrity of the ground, changes in temperature and stress are likely to increase the number and size of crevices in the rock or ground surrounding an underground test site. These crevices provide paths for meaningful exchanges of radioactive isotopes with the environment via ground water, rivers, oceans and the atmosphere. Given the dynamic nature of the Earth’s crust, radiation generated in underground tests must eventually escape into the ecosystem.

The most common long-term radioactive isotopes produced by testing are Caesium-137, Strontium-90, Plutonium-239 and Americium-241. Caesium-137 and Strontium-90 are known to be transported by water and to enter the food-chain. Plutonium-239 and Americium-241 escape into the atmosphere and can be inhaled. All of these isotopes are highly radioactive and have been proven to cause cancer and genetic mutation. In addition, isotopes from previous tests which had already settled or lodged in the rock can be released into the environment by subsequent nuclear testing.

There is no such thing as safe nuclear weapon testing. There is always a danger that future generations will be placed at risk through radiation from today’s tests.

2. Political Effects of Nuclear Testing

Nuclear testing creates political instability because it requires a substantial economic investment. One, small fission device typically costs five million U.S. dollars to manufacture. Pakistan’s economy is fragile already. Pakistan’s total budget for 1996-1997 was $12.5

75. See id.
76. See id.
77. See id.
78. See id.
79. See id.
80. See id.
81. See id.
82. See id.
83. See id.
84. See id.
85. See Khan, supra note 39, at 37.
billion, out of which 45 percent was spent on debt service and 24 percent on defense. If Pakistan begins increasing its defense budget there will be nothing left for its people. The spending effects of continued nuclear tests might bankrupt the Pakistani economy. One day, the Pakistani government might be forced to sell nuclear fuel, nuclear weapons or nuclear technology to generate capital. Uncontrollable nuclear proliferation could ensue and the world political regime might become destabilized.

There are strong political forces contending for control of Pakistan. Pakistan has been ruled on and off by the military for half of its history. In October of 1999, Pakistan's democratically elected government was overthrown and traded for a military regime. If Pakistan's political climate does not eventually stabilize, Pakistan may become divided and compartmentalized, like a warlord-ridden, nuclear Somalia. Each faction would control nuclear weapons and a nuclear civil war could ensue. The world could be at the mercy of a rogue nuclear state. The effect on the world could be incredibly destabilizing.

3. Conclusion

Due to the detrimental environmental and potentially destabilizing effects of an arms race between India and Pakistan, further nuclear development must be prohibited. A nuclear arms race must be averted and nuclear testing must grind to a halt. There are legal strategies in international law that can be harnessed to achieve this goal.

IV. Current Status of International Law

It is undisputed that nuclear tests have the ability to cause vast environmental disruption and protracted illnesses. Further, nuclear

86. See id.
87. See id. ("One billion people live in India and Pakistan and 740 million of them lack elementary sewage facilities. Nevertheless, between 1990 and 1996, the two countries spent the equivalent of $70 million dollars on defense.").
88. Kotch & Sidhu, supra note 53, at 44.
90. See id.
weapons can destabilize the world political regime. The international community has done much to slow the proliferation of nuclear weapons and minimize the harm of nuclear testing. There are two important legal strategies that have been harnessed to bar non-nuclear nations from developing nuclear technology. First, the international community drafted and signed treaties intended to halt nuclear testing and development. Second, the international community recognized international customs that place restrictions on nuclear weapon testing.

A. Treaty

Treaties are considered one of the main sources of international law and, consequently, have significant precedential value. One of the most basic principles of international law is *pacta sunt servanda*, a nation must keep its promises. Treaties are formal records of these promises. A nation is bound by a treaty only if it agrees to abide by the treaty's provisions. Also, a nation may avoid being bound by all provisions in a treaty by making reservations to specific treaty provisions before signing. Reserved treaty provisions can not be enforced against the nation that reserved them.

Treaty obligations are enforced under the authority of a U.N. resolution or by a decision from the International Court of Justice (ICJ). Trade embargoes and military interventions are the most efficient methods of obtaining compliance with treaty obligations.


93. See CTBT, supra note 92; SAZT, supra note 92; AZT, supra note 92, at 704; SPZT, supra note 92.

94. See Statute of the International Court of Justice, June 26, 1945, ch. II, art. 38, 59 stat. 1031, U.S.T.S. 993. This provision lists four categories from which the ICJ can draw when determining what is international law.


96. See Vienna, supra note 95, art. 18.

97. See id., art. 21.

98. See id.
There are two categories of treaties that govern the role of nuclear weapons. First, there are treaties prohibiting the testing and development of nuclear weapons. Second, there are treaties establishing or recognizing international environmental obligations that prohibit the testing and development of nuclear weapons.

1. Treaties That Prohibit Testing and Development

There are treaties that limit the acquisition, manufacture and possession of nuclear weapons. Some treaties prohibit nations from deploying nuclear weapons in specific areas and other treaties forbid nations from testing nuclear weapons in certain locations. India and Pakistan are parties to only one of these treaties. India and Pakistan are both parties to the Treaty Banning Nuclear Weapons Tests in the Atmosphere in Outer Space and Under Water (LTBT).

Article I, section 2 of the LTBT prohibits nations from “causing, encouraging, or in any way participating in, the carrying out [of] any nuclear weapon test explosion” in the atmosphere, in outer space or underwater. On its face, the LTBT does not specifically prohibit underground nuclear tests. However, Article I, section (1)(b) of the LTBT prohibits tests that occur in “any... environment if such explosion causes radioactive debris to be present outside the territorial limits of the state.” The treaty further states that none of its provisions will bar any future prohibition on forms of nuclear testing, even underground nuclear explosions.

In 1963, when the LTBT was signed and concluded, scientific research had determined that underground nuclear tests were environmentally safe. Today, science thinks that underground

99. See generally CTBT, supra note 92, at 924706; SAZT, supra note 92, at 639; AZT, supra note 92, at 702; SPZT, supra note 92, at 1440; NPT, supra note 92, at 809; LTBT, supra note 92, at 43.

100. See generally SAZT, supra note 92, at 639; AZT, supra note 92, at 702; SPZT, supra note 92, at 1440; Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Seabed and Ocean Floor and in the Subsoil Thereof, Feb. 11, 1971, 23 U.S.T. 701, 10 I.L.M. 145 [hereinafter OFT].

101. See generally SAZT, supra note 92, at 639; AZT, supra note 92, at 702; SPZT, supra note 92, at 1440; LTBT, supra note 92, at 43; Antarctic Treaty, Dec. 1, 1959, 12 U.S.T. 794, 402 U.N.T.S. 72 [hereinafter Antarctica].

102. LTBT, supra note 92, art. I.

103. LTBT, supra note 92, art. I, sec. 2.

104. LTBT, supra note 92, art. I, sec. 1(b).

105. See id.
nuclear tests have a significant probability of releasing radioactive isotopes into the environment. Over the course of years, the effects of these radioactive isotopes cannot be kept confined within the territorial boundaries of any one nation. Therefore, if the LTBT were to take these new scientific discoveries into account, it would also prohibit underground nuclear explosions. However, the LTBT specifically omits underground nuclear explosions from its list of geographic prohibitions. For this reason, the international community may be unlikely to extend the prohibitions of the LTBT to underground nuclear tests.

Despite the great number of other treaties limiting nuclear weapons development, India and Pakistan have signed none of them. India has protested against the major nuclear weapons treaties. There is no controlling international agreement, other than the LTBT, that can be construed to specifically prohibit India and Pakistan from conducting underground nuclear tests.

2. Treaties Establishing International Environmental Obligations

There are many treaties whose provisions limit the legality of detonating nuclear weapons through international environmental law. However, India and Pakistan are only parties to two of them.

106. See WHO Report, supra note 72.
107. See id. at 12. (This report details new scientific discoveries regarding underground nuclear testing that may trigger nuclear testing prohibitions contained in the LTBT. Most specifically, that radioisotopes are necessarily released into the environment by underground nuclear tests and their effects cannot be contained within a nation's territorial boundaries. If this is truly the case, art. I, sec. 2 of the LTBT would completely bar even underground nuclear testing).
108. LTBT, supra note 92, art. I.
109. Albright & Hibbs, supra note 41, at 2; Haq, supra note 8, at 1.
110. See LTBT, supra note 92, at 43 (as evidenced by the treaty's title, which aims to "ban nuclear weapons testing in the atmosphere, outer space and underwater.").
112. Protocol Additional (No. I) to the Geneva Conventions of August 12, 1949,
The first is the 1977 Protocol I of the Geneva Convention (Protocol I).113 Article 35(3) prohibits the employment of "methods or means of warfare which are intended, or may be expected, to cause widespread, long-term damage to the natural environment."114 Article 55(1) similarly prohibits "widespread, long-term and severe damage to the environment."115

The second treaty is the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD).116 Article 1(1) of ENMOD prohibits the use of weapons having "widespread, long-lasting, or severe effects on the environment."117

India has signed and ratified ENMOD, but is not a party to Protocol I.118 Pakistan has signed and ratified both of these treaties.119 The provisions of ENMOD and Protocol I define clear environmental obligations for nations waging or preparing to wage war. However, the provisions of ENMOD have two shortcomings in regards to nuclear testing.

First, "Environment" is not defined in either document and this renders their provisions vague.120 There has been no litigation to define this term and no move by the international community to clarify its meaning. The treaty's scope remains uncertain. This oversight may pose a difficult obstacle in the enforcement of the treaties.

Second, more importantly, the context of the prohibitions in both treaties refer to the use of weapons in warfare. The Protocol I was proposed for the specific purpose of codifying the laws of war.121 ENMOD was instituted for the sole purpose of prohibiting nations from permanently altering the environment as a strategy of war.122

113. See generally Protocol I, supra note 112.
114. Id.
115. Id.
116. Cf. generally ENMOD, supra note 112.
117. Id.
118. See generally Protocol I, supra note 112; ENMOD, supra note 112.
119. Cf. generally ENMOD, supra note 112; Protocol I, supra note 112.
120. See generally Protocol I, supra note 112; ENMOD, supra note 112.
121. See generally Protocol I, supra note 112.
122. See generally ENMOD, supra note 112.
Environmental conduct in times of peace has not been addressed in either of these documents. Neither of these treaties provide controlling authority for the peacetime development or testing of nuclear weapons.

India and Pakistan engaged in nuclear testing only during times of peace with one another.\textsuperscript{123} Despite the unrest in Kashmir, India and Pakistan have signed an armistice and, even though the fighting continues, it is considered valid under international law.\textsuperscript{124} Neither nation is considered to be engaged in war. Further, the nuclear tests were not directly used in warfare and were even deemed as "peaceful" by the Indian and Pakistani governments. The aforementioned treaties specifically apply to use of weapons on a battlefield, in times of warfare.\textsuperscript{125} For that reason, these treaties are not controlling in this situation.

\textbf{B. Custom}

Customary international law refers to the body of uncodified law creating legal obligations between nations. No single organization exists to create, interpret or enforce customary international law.\textsuperscript{126} Customary international law is created and governed in four ways: (1) by international conventions, (2) behavior of nations, (3) general principles of law recognized by nations, (4) and judicial decisions/scholarly writings.\textsuperscript{127} Customary international law is relied on when there is no written construction of law.

\textit{1. How Custom is Created}

Traditional behavior between nations may develop into customary international law. Behavior between nations must be extensive and virtually uniform to become part of custom, but it does not have to be unanimous.\textsuperscript{128} There are traditionally four elements that are examined when determining if a traditional behavior is custom: (1) there must be a concordant behavior by a number of nations, (2) there must be a repetition of this behavior over a

\textsuperscript{123}. See Khan, \textit{supra} note 9, at 491.
\textsuperscript{124}. See id.
\textsuperscript{125}. See generally Protocol I, \textit{supra} note 112; ENMOD, \textit{supra} note 112.
\textsuperscript{126}. B. Weston, R. Falk, & A. D'Amato, \textit{International Law and World Order: A Problem Oriented Coursebook} 79 (2d ed. 1990) [hereinafter World Order].
\textsuperscript{127}. See id.
\textsuperscript{128}. See id.
considerable period of time, (3) the behavior must be viewed as being legally binding and (4) there must be a general acquiescence in the behavior by other nations. The last two elements are often referred to as "opinio juris."  

A provision of a convention or a treaty may attain universal acceptance as customary law even if only a few nations were a part of it. When a provision of custom is incorporated into a convention or a treaty, it cannot be invalidated if a party objects or withdraws from the convention or treaty. However, if a nation expressly objects to a behavior before it is recognized as becoming custom, the nation will not be bound by this custom. This is called the "persistent objector" exception.

Although India and Pakistan are not parties to the majority of treaties that prohibit nuclear testing or development and cannot be legally bound to them, the Vienna Convention states that nothing precludes a treaty from eventually becoming custom. The prohibition against nuclear testing and development included in many prior treaties could now be considered custom. If so, the nuclear tests carried out by India and Pakistan controverted international customary law.

There are two ways that a prohibition against nuclear testing and development might exist in international custom. First, the magnitude and unanimity of nations ratifying treaties that prohibit nuclear testing and development might have elevated the prohibition to custom. Second, general principles of customary international environmental law may prohibit nuclear testing and development.

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129. See id.
130. Id.
131. See Vienna, supra note 95, art. 38 (arguing that nothing in articles 34 and 37 stop a rule in a treaty from evolving into customary international law).
134. Id. at 1642.
135. See generally CTBT, supra note 92; SAZT, supra note 92; AZT, supra note 92; SPZT, supra note 92; NPT, supra note 92.
136. Vienna, supra note 95, art. 38.
137. Sheldon, supra note 132, at 244-46.
138. See id.
139. Timothy J. Heverin, Legality of the Threat or Use of Nuclear Weapons: Environmental and Humanitarian Limits on Self-Defense, 72 NOTRE DAME L. REV.
2. Treaty Prohibitions on Nuclear Testing and Development as Custom

The cumulative effect of treaties addressing nuclear issues might establish a customary rule prohibiting the use of nuclear weapons. There are treaties that restrict and prohibit nuclear tests, call for eventual nuclear disarmament and provide for the non-proliferation of nuclear technology. Together these treaties arguably represent the international community's dedication to complete nuclear disarmament. These treaties can be taken as evidence of the international community's attempt to eliminate nuclear weapons. There are four main treaties that illustrate the scope of the international community's efforts to eliminate nuclear weapons.

a. Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water

The LTBT was concluded in 1963. More than 120 states were party to the agreement. Article I, section 2 prohibits nations from "causing, encouraging, or in any way participating in [a] nuclear weapon test explosion, or any other nuclear explosion" in the atmosphere, in outer space or underwater. Article I, section (1)(b) explains the policy behind this limitation by stating that the LTBT will not "prejudice... the conclusion of a [future] treaty resulting in the banning of all nuclear test explosions, including underground explosions."

The large number of nations that ratified the LTBT indicates that the international community desired to prohibit certain nuclear testing methods and prevent their environmental effects. Through Article I, section (1)(b), the international community signaled its desire to eventually achieve a complete prohibition on all forms of nuclear testing.

1277, 1296 (1997).
140. See generally CTBT, supra note 92; SAZT, supra note 92; AZT, supra note 92; SPZT, supra note 92; NPT, supra note 92; LTBT, supra note 92.
141. See id.
142. See generally LTBT, supra note 92.
143. See id.
144. LTBT, supra note 92, art. 1, § 2.
145. LTBT, supra note 92, art. 1, § 1(b).
b. Treaty on the Non-Proliferation of Nuclear Weapons

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) represents the first important step in eliminating the spread of nuclear technology. The NPT was signed by 95 countries in 1968 and first entered into force in 1970. The NPT utilizes the International Atomic Energy Agency (IAEA) to safeguard the transfer of nuclear materials and promote the peaceful use of nuclear research. The NPT requires non-nuclear nations to comply with IAEA safeguards to receive the benefits of nuclear research for peaceful purposes. The NPT also requires the nuclear nations to pursue negotiations for complete nuclear disarmament in good faith.

In 1995, the NPT was extended indefinitely by the Review Conference of States Parties and signed by 170 nations. The principles and objectives identified by the conference include universal adherence to the NPT, establishment of further nuclear-free zones, strengthening nuclear safeguards and taking more steps toward nuclear disarmament.

Non-proliferation of nuclear capabilities to non-nuclear states is an important priority for many nations. This concern is no better evident than through the creation and reinstatement of the NPT. The support behind the NPT shows that nuclear proliferation is a growing matter of global concern and that the international community concertedly desires to prohibit it.

c. Nuclear-Free Zone Treaties

The Nuclear-Free Zone Treaties (NFZT) are designed to establish prohibitions on the testing or stationing of nuclear weapons

148. NPT, supra note 92, art. I.
149. See Meise, supra note 146, at 541.
151. See id.
152. See NPT, supra note 92, art. I (this is evidenced by the fact that 100 nations participated in the original agreement).
153. See id. (The NPT was reenacted by 75 more nations than had initially enacted it).
154. See Haq, supra note 8, at 1.
inside certain regions. NFZTs have been used to establish systems
of nuclear safeguards that reach an even greater number of activities
than the NPT. Since 1964, over 15 of the NFZTs have entered into
force. NFZTs build on the NPT and serve to tighten the ever
closing nuclear testing window.

The promulgation of the NFZTs have covered a significant area
of the world and incorporate nations that were not a part of previous
nuclear development treaties. The NFZTs build on the provisions
of the NPT and signal the international community's growing desire to
foreclose the ability of nations to develop nuclear weapons.

d. Comprehensive Test Ban Treaty

The Comprehensive Test Ban Treaty (CTBT) opened for
signature on September 20, 1996. It is the most far-reaching
attempt to impede the testing and development of nuclear weapons.
Article I of the CTBT, building on provisions taken directly from the
NPT and LTBT, asks:

[E]ach State Party... (1) not to carry out any nuclear weapon test
explosion or any other nuclear explosion; (2) to prohibit and
prevent any nuclear explosions at any place under its jurisdiction
and control; and (3) to refrain from causing, encouraging or, in any
way participating in the carrying out of any nuclear weapon test
explosion or any other nuclear explosion.

The CTBT establishes a global monitoring organization to
achieve the object and the purpose of the treaty. The CTBT also
establishes a new, more stringent verification regime than the NPT.

155. See Mark E. Rosen, Nuclear Weapons Free Zones: Time for a Fresh Look, 8
156. See id. at 34.
157. See generally SAZT, supra note 92, at 639; AZT, supra note 92, at 702; SPZT,
 supra note 92, at 1440; OFT, supra note 100, art. I; Treaty for the Prohibition of
Governing the Activities of States in the Exploration and Use of Outer Space,
Including the Moon and Other Celestial Bodies, Jan. 27, 1967, art. IV, 18 U.S.T. 2410,
480 U.N.T.S. 45; Antarctica, supra note 101, art. V & VI.
158. NPT, supra note 92, art. VII ("Nothing in this treaty effects the rights of any
group of States to conclude regional treaties in order to assure the total absence
of nuclear weapons in their respective territories.").
159. CTBT, supra note 92, art I.
160. CTBT, supra note 92, art. I; NPT, supra note 92, art. I; LTBT, supra note 92,
art. I.
161. CTBT, supra note 92, art. IV.
162. See Youngblood, supra note 147, at 554.
It consists of an international monitoring system and provides for on-site, nuclear facility inspections. The CTBT allows violations to be redressed before the ICJ. Lastly, the CTBT reiterates the NPT regime’s goal of total disarmament.

The CTBT represents the culmination of the process of prohibiting nuclear weapons development because it attempts to stop all nuclear testing. The CTBT is uncanny among treaties because it does not allow nations to make reservations to any of its provisions. If a nation signs it, the nation must comply with it in whole. A nation is necessarily bound to every sentence of the treaty. This shows the international community’s serious commitment to prohibit all nuclear testing, once and for all.

After signature, a nation can only opt out of the CTBT’s provisions if it enacts the “supreme interest” clause. This clause can only be invoked if the very existence of a nation is threatened and the nation can only use its nuclear weapons in self-defense. Six months notice must be given for the request to take effect under the treaty. The notice requirement is not very practical if a nation is faced with a rapid need to engage in self-defense. The concept of self-defense is sacred in international law. It is found in nearly every international treaty on the law of war. Placing a limitation on the application of self-defense shows that the international community strongly desires to deter a nation from developing nuclear weapons.

Finally, the provision prohibiting one nation from “encouraging” others to develop nuclear weapons is extended to effects occurring in other states. For example, this provision prohibits country X from testing a nuclear device if country Z will test a nuclear device in response. This provision makes starting an arms race contrary to international law. It shows that the international community is not only affirming prior steps to curtail nuclear weapons development,

163. See id.
164. See id.
165. CTBT, supra note 92, preamble.
166. See id. at art. XV.
167. Id. at art. IX, para. 2.
168. See id.
169. See id. at art. IX, para. 3.
170. See U.N. Charter art. 51; IRP. supra note 111, at 5; PUNT, supra note 111, at 4.
171. See U.N. Charter art. 52; IRP, supra note 111, at 5; PUNT, supra note 111, at 4.
172. CTBT, supra note 92, art. I, para. 2.
but it is also instituting efforts to limit their undesirable economic and political effects.

**e. The Elements of Custom Applied**

**Behavior**

Behavior is the first issue to examine in determining whether these treaties have been elevated to custom.\(^{173}\) Behavior must be concordant and repetitive over a long period of time.\(^{174}\)

There is no doubt that the international community engaged in a concordant behavior. Many nations voted with one another to limit the proliferation of nuclear technology and eventually ban all types of nuclear testing.\(^{175}\) Further, every treaty expressed the eventual goal of complete nuclear disarmament.\(^{176}\) The smallest ratifying vote for a nuclear development treaty was 95 nations.\(^{177}\) Even this amount represents a significant share of the entire international community.

The behavior was repetitive because of the number of treaties involved. There has been a long history of international opposition to the testing, maintenance, proliferation and use of nuclear weapons.\(^{178}\) This is evidenced by many UN General Assembly resolutions and international agreements between 1974 and 1995 that were aimed at reducing the threat from nuclear weapons and eliminating nuclear testing.\(^{179}\) The NPT conference reiterated the importance of the link between a moratorium on further nuclear testing and non-proliferation by mandating that nations exercise the "utmost restraint" on nuclear testing until the CTBT was completed.\(^{180}\) Other

The effort to prohibit nuclear development and testing through treaties has continued over the better part of 45 years.\footnote{181. See Nuclear Weapons Opinion, supra note 71, at 809; Nuclear Test Case (New Zealand v. France), 1995 I.C.J. 288 [hereinafter Nuclear Test Case].} Although 45 years is not very long in terms of world history, nuclear weapons were only invented 55 years ago. In comparison, negotiations to halt nuclear testing began at nearly the same time nuclear weapons were invented. These negotiations should be viewed in light of the date nuclear testing began. Also, 45 years is a long time for the international community to remain united in the pursuit of a single goal. There are few other international concerns that have garnered so much attention and held it for so long. For these reasons, nuclear development treaties satisfy the behavioral component of custom.

Opinio Juris

The second element of custom is opinio juris.\footnote{182. See Sheldon, supra note 132, at 227 (Negotiations to limit nuclear weapon production began shortly after the end of WWII).} Nuclear development treaties need to be viewed as legally binding agreements and generally followed by the international community to meet this element.\footnote{183. See World Order, supra note 126, at 80.}

Many nuclear treaty's resoundingly indicate a desire to eventually prohibit the testing of nuclear weapons entirely. During the years after the LTBT was signed, the five nuclear nations continued to test nuclear weapons. Yet, none of the five nuclear nations tested nuclear weapons above ground. This behavior shows that the nuclear weapons nations thought that the LTBT was binding.

Many nuclear weapon treaties expressly attempted to halt nuclear development. During the years after the NPT was signed, China proliferated nuclear technology to many non-nuclear nations, most notably to Pakistan.\footnote{184. See id.} Many non-nuclear nations acquired

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\footnote{185. See Albright, supra note 58, at 25.}
nuclear technology during this period and often with the help of nuclear nations.\textsuperscript{186} This shows that China, among others, did not particularly consider the NPT to be legally binding.\textsuperscript{187} Even so, proliferation is not an activity that is inconsistent with the testing limitations placed on the international community by the LTBT. Aiding proliferation efforts in contravention to an international treaty shows that a nation did not believe prohibitions against development to be binding.

Before and after the CTBT was negotiated and signed, nuclear nations engaged in arms races and even threatened to use nuclear weapons against each other. These actions are not consistent with the provisions of the CTBT and do not show a belief that prohibitions on nuclear development were binding.

For these reasons, the international community did not act with opinio juris in regard to nuclear development. In contrast, the international community engaged in actions that would support the theory that opinio juris existed in relation to a ban on nuclear testing. The international prohibition against nuclear testing obtained the force of law.

Persistent Objector

Even if the current prohibitions against nuclear testing are considered custom, the rule of the persistent objector may nullify their applicability to India and Pakistan.\textsuperscript{188} There are two elements to the rule of the persistent objector.\textsuperscript{189} The first is that a nation must make an objection to an emerging custom. An objection is necessary to put a nation's neighbors on notice of its views.\textsuperscript{190} The second is that the objection must be persistent, consistent and made before the custom is formed.\textsuperscript{191} The objection must be made through an action exercising a legal right or through a statement declaring the existence of a legal right.\textsuperscript{192}

India and Pakistan's 1998 nuclear tests qualify as actions exercising legal rights. Many nations argue that the mere existence of treaties prohibiting nuclear testing proves that testing is a legal

\begin{itemize}
  \item \textsuperscript{186} See id.
  \item \textsuperscript{187} See id.
  \item \textsuperscript{188} See Steinfeld, supra note 133, at 1642.
  \item \textsuperscript{189} See id.
  \item \textsuperscript{190} See id.
  \item \textsuperscript{191} See id. at 1643.
  \item \textsuperscript{192} See id.
\end{itemize}
right.  If nuclear testing was not a legal right, there would be no need to have treaties prohibiting it. Exploding a nuclear device is simply an exercise of this legal right.

If nuclear testing is not naturally a legal right, India and Pakistan have declared the existence of their right to test nuclear weapons. The CTBT will not enter into force until all 44 states listed in the Conference on Disarmament ratify it. India and Pakistan are included in the 44 nations needed for ratification and they will not sign on to the treaty. India has protested openly against the CTBT. India has issued statements saying that they will never sign the CTBT and that it will never enter into force. Pakistan opposes the CTBT because India will not sign on to the treaty. Pakistan has also publicly decried the CTBT as being unfair and stated that it will never sign it. Both nations have vociferously opposed the CTBT both in the UN General Assembly and in the world’s press.

India and Pakistan may have exercised a legal right but, their objection was not persistent and consistent. The requirements of persistence and consistency are not met through India and Pakistan’s long-standing nuclear development programs. India tested its first nuclear device in 1974 and then announced a moratorium on further testing. Pakistan prepared its nuclear test site and started manufacturing weapon grade nuclear fuel sometime in the 1970s. These actions were permitted under existing international law. They were not objections to nuclear testing treaties. India and Pakistan’s nuclear tests in 1998 were not persistent and consistent. These tests only occurred once. Then India even declared a moratorium on further testing.

India’s and Pakistan’s objections did not come before the custom against all nuclear testing was created. India and Pakistan’s tests were conducted during the existence of previous treaties banning

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193. See id. at 1655.
194. See id.
195. See CTBT, supra note 92, at annex 2.
196. See Haq, supra note 8, at 1.
197. See id.
198. See id. ("India will never sign this unequal treaty, not now, not later, this treaty will never enter into force" said Ambassador Arundhati Ghose).
199. See id.
200. See id.
201. See Albright, supra note 58, at 22.
202. Id. at 24.
nuclear development and after the signature date of the CTBT. If the custom against nuclear testing is viewed as being formed at the ratification of any treaty, it should be grounded here.

\[ f. \text{ Conclusion} \]

Although the international community has long attempted to put an end to nuclear development, its behavior has been contradictory. Many nations have stated that they support a total ban on nuclear development, yet continued to conduct nuclear research and build up enormous nuclear arsenals. Some of these nations even proliferated nuclear technologies to others. Further, India and Pakistan have always made it clear that they were attempting to develop nuclear weapons. India even went so far as to test its own nuclear weapons in 1974. This international double-standard, coupled with the argument of the persistent objector, states a strong case against the prohibition on nuclear development becoming customary international law.

In addition to its efforts to halt nuclear development, the international community has attempted to end nuclear testing. Initially, it banned all nuclear tests above the ground. The international community complied with that prohibition completely. Most recently, the international community has attempted to ban all forms of nuclear tests through the CTBT.

India and Pakistan signed the LTBT. They tested nuclear weapons underground. This behavior complies with the prohibition contained in the LTBT. They have not previously objected to the total ban on nuclear testing. India’s recent nuclear tests occurred only once and long after the CTBT was signed. The sheer number of nations combined under the CTBT elevated the prohibition on nuclear testing and development into custom.

\[ 3. \text{ Customary International Environmental Law} \]

The detrimental environmental effects of nuclear testing violates existing and forming rules of international environmental law. The indiscriminate and uncontrollable nature of radioactive fallout

\[ 203. \text{ See CTBT, supra note 92, at annex 2.} \]
\[ 204. \text{ See id., art. I.} \]
\[ 205. \text{ See Steinfeld, supra note 133, at 1649.} \]
violates customary international environmental law as it relates to the
obligations of the state.\textsuperscript{206} Such a widespread threat to human health
and natural resources violates firmly entrenched customs that
specifically prohibit environmental damage and impact principles of
territorial integrity and discrimination.\textsuperscript{207} Also, the ICJ has recently
recognized many newly forming principles of international
environmental law as attaining the status of custom.\textsuperscript{208} Nuclear testing
violates these newer principles as well.

There are four ways nuclear testing violates customary
international environmental law. The testing of nuclear weapons
violates the concept of transboundary harm, the precautionary
principle, the principle of intergenerational equity and violates
principles of customary international environmental law that are
regarded as jus cogens.

\textit{a. The Concept of Transboundary Harm}

There is a newly introduced norm of customary international law
not to cause transboundary harm.\textsuperscript{209} Recently, the ICJ was asked to
draft a general advisory opinion on the use of nuclear weapons.\textsuperscript{210}
Article 29 of the majority opinion found that the concept of
transboundary harm has ascended to become "part of the corpus of
international law relating to the environment."\textsuperscript{211} This norm was first
enumerated in the \textit{Trail Smelter Arbitration}.\textsuperscript{212}

In \textit{Trail Smelter}, a special arbitral tribunal determined that
Canada was liable for damage to U.S. crops caused through sulfur
dioxide fume emissions originating in Canada.\textsuperscript{213} The tribunal decided
that, under international law, no nation is allowed to use or permit
the use of its territory to cause injury to another nation's territory or
people therein.\textsuperscript{214} \textit{Trail Smelter} is not binding precedent and its
decision was limited to the U.S. and Canada.\textsuperscript{215} However, it greatly

\begin{itemize}
\item \textsuperscript{206} \textit{See id.} at 1651.
\item \textsuperscript{207} \textit{See id.}
\item \textsuperscript{208} \textit{See Nuclear Weapons Opinion, supra note 71, at 821.}
\item \textsuperscript{209} \textit{See Heverin, supra note 139, at 1296.}
\item \textsuperscript{210} \textit{See generally Nuclear Weapons Opinion, supra note 71, at 809.}
\item \textsuperscript{211} \textit{Id.} at 821.
\item \textsuperscript{212} \textit{See} \textit{Trail Smelter Arbitration (U.S. v. Can.), 3 R.I.A.A. 1905 (1941), reprinted in 35 AM. J. INT'L L. 684, (1941).}
\item \textsuperscript{213} \textit{Id.}
\item \textsuperscript{214} \textit{See id.}
\item \textsuperscript{215} \textit{Id.}
\end{itemize}
influenced the UN Conference on the Human Environment at Stockholm.\footnote{216}{See Stockholm, supra note 111, at 1416.}

The Stockholm Convention used the \textit{Trail Smelter} decision to illustrate the international norm to avoid transboundary harm.\footnote{217}{See id.} Principle 21 of the Stockholm Declaration states:

\begin{quote}
[Nations] have, in accordance with the Charter of the [UN] and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their own jurisdiction and control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.\footnote{218}{Id. at principle 21.}
\end{quote}

Stockholm 21 is usually applied to peacetime, transboundary pollution.\footnote{219}{See Heverin, supra note 139, at 1297-98.} The content of Stockholm 21 has been recognized in treaties such as the Law of the Sea Convention, the ASEAN Convention on the Conservation of Nature and Natural Resources, and the 1979 Geneva Convention on Long-Range Transboundary Air Pollution.\footnote{220}{See id.} The principle of transboundary harm was also recently adopted in the Rio Declaration.\footnote{221}{See Rio, supra note 111, at 876.}

Nuclear weapons are capable of damaging the environment in unprecedentedly enormous ways. Nuclear weapons can destroy the entire eco-system of the Earth. There are already enough nuclear weapons to destroy the world many times over.\footnote{222}{See Nuclear Weapons Opinion, supra note 71, at 891.}

The fallout from even one above-ground, nuclear detonation cannot be confined within national boundaries.\footnote{223}{See id. at 891.} WHO studies indicate that the fall-out would extend for hundreds of miles downwind.\footnote{224}{See id. at 891.} The gamma-rays emitted from the explosion could reach across national boundaries through radioactivity deposited in the ground, inhalation from the air, consumption of contaminated food, and from consumption of suspended radioactivity.\footnote{225}{See id.}

All nations are in agreement that extremely elaborate protections are necessary to prevent underground nuclear explosions.
from contaminating the environment. Even now, nuclear powers accept that underground nuclear explosions are so deleterious to health and the environment that they should be banned.

For example, the geological structure of an aquifer can be impaired by underground nuclear testing and its contents irradiated. Many aquifers span the distance between national boundaries and their contents can be shared by many countries. Water in liquid state is mainly groundwater, representing 22.4 percent of all fresh water. The effects of underground nuclear tests are far-reaching and unpredictable. Contamination of groundwater within an aquifer can spread through many different countries and even go unnoticed for many years. Underground nuclear explosions are capable of silently poisoning entire populations of other nations.

The environment, the common habitat of all member states of the UN, cannot be damaged by one or more members to the detriment of all others. The principles of environmental protection have become so deeply rooted in the conscience of mankind that they have become particularly essential rules of international law. The testing of nuclear weapons violates these principles and is unacceptable.

b. The Precautionary Principle

The precautionary principle provides that "where there are threats of serious or irreversible damage (to the environment), lack of full scientific certainty (about whether damage will be caused) should not be used as a reason for postponing measures to prevent environmental degradation." This principle has been expressed in seven international treaties and it has gained broad acceptance on the international level.

A corollary to the the precautionary principle is the requirement to make an Environmental Impact Assessment (EIA)
before a nation is able to undertake an action that is likely to significantly effect the environment.\textsuperscript{224} The Noumea Convention incorporates this mechanism by containing an explicit obligation to conduct an EIA before beginning any project which might effect the marine environment.\textsuperscript{235}

Underground nuclear testing is always subject to the possibility of harmful radiation escaping into the environment.\textsuperscript{236} There is no possible way to insure that the radiation will remain trapped underground for the duration of the test, much less for the time it will take for the radioactive remnants to become inert. A significant amount of radioactive material will persist for thousands of years before it begins to noticeably decay.\textsuperscript{237} There is no known process to reverse the effects of a nuclear explosion. By its very nature, nuclear testing is at odds with the prescriptions of customary international environmental law and cannot satisfy its demands. For this reason, nuclear testing violates international law and should be prohibited.

c. The Principle of Intergenerational Equity

Intergenerational equity is a concept of customary international environmental law that places a responsibility on nations to "protect and improve the environment for present and future generations."\textsuperscript{238} Although a nation has sovereignty over its own territory, intergenerational equity limits this sovereignty to uses of territorial resources that do not destroy resources for future generations.\textsuperscript{239} To satisfy this principle, a nation must be able to prevent or repair environmental damage caused by its use of the environment.\textsuperscript{240} Otherwise, the nation is automatically prohibited from engaging in that particular use of the environment.\textsuperscript{241}

The principle of intergenerational equity has woven itself into customary international environmental law through major treaties, judicial opinions, and general principles of law recognized by civilized

\begin{itemize}
\item \textsuperscript{224} Nuclear Test Case, \textit{supra} note 181, at 343.
\item \textsuperscript{235} Noumea Convention for the Protection of the Natural Resources and Environment in the South Pacific Region, Nov. 25, 1986, 26 I.L.M. 38 (1987).
\item \textsuperscript{236} See WHO Report, \textit{supra} note 72.
\item \textsuperscript{237} See id.
\item \textsuperscript{238} Nuclear Test Case, \textit{supra} 181, at 342 (quoting the Stockholm Declaration on the Human Environment, principle 1).
\item \textsuperscript{239} See Tokarz, \textit{supra} note 232, at 752.
\item \textsuperscript{240} See id. at 752.
\item \textsuperscript{241} See id.
\end{itemize}
nations. The 1979 London Ocean Dumping Convention, the 1973 Convention on International Trade in Endangered Species, and the 1972 Convention Concerning the Protection of the world Cultural and Natural Heritage are all treaties that mention intergenerational equity.\textsuperscript{242} There are several major scholarly works of great renown that examine the concept of intergenerational equity.\textsuperscript{243} There are a multiplicity of traditional legal systems across the globe that recognize this principle.\textsuperscript{244} There have been a series of major international declarations commencing with the 1972 Stockholm Declaration on the Human Environment.\textsuperscript{245} Finally, the UN Charter specifically states that it is dedicated to social progress and better standards of life for "succeeding generations."\textsuperscript{246}

The effects of underground nuclear testing extend beyond the limits of all foreseeable historical time.\textsuperscript{247} One by-product of nuclear testing, plutonium 239, has a half-life over 20,000 years.\textsuperscript{248} This means that the environmentally hazardous, residual radiation generated by nuclear testing will remain embedded in the Earth for hundreds of thousands of years. Over this period of time, there is no doubt that natural changes in the Earth's geology will allow the trapped radiation to escape and interact with ground water or the atmosphere. The effects on the world's eco-system could be catastrophic. No one generation is allowed under the law to inflict such damage on future generations.\textsuperscript{249}

d. Environmental Law as Jus Cogens

Jus cogens refers to general principles of international law that are so fundamental they cannot be disobeyed.\textsuperscript{250} Jus cogens receives its strongest support from the 1969 Vienna Convention on the Law of Treaties.\textsuperscript{251} Article 53 states that "a treaty is void if, at the time of its

\begin{itemize}
\item \textsuperscript{242} See Nuclear Weapons Opinion, \textit{supra} note 71, at 888.
\item \textsuperscript{243} See id.
\item \textsuperscript{244} See id.
\item \textsuperscript{245} See Rio, \textit{supra} note 111, at principle 3; Stockholm, \textit{supra} note 111, at principle 1.
\item \textsuperscript{246} U.N. Charter, \textit{supra} note 170, at preamble.
\item \textsuperscript{247} See Nuclear Weapons Opinion, \textit{supra} note 71, at 890.
\item \textsuperscript{248} See id.
\item \textsuperscript{249} See id. at 888.
\item \textsuperscript{250} See Steinfeld, \textit{supra} note 133, at 1648.
\item \textsuperscript{251} See id.
\end{itemize}
A peremptory norm is defined as "a norm accepted and recognized by the international community of States as a whole as a norm from which no derogation is permitted." This definition of peremptory norm is equivalent to the concept of jus cogens. General principles that are considered jus cogens are absolutely binding. There is no mechanism to escape their legal power.

Jus cogens is based in the essential rules necessary to maintain human society. For example, principles defending peace and security, principles against the use of force and principles prohibiting crimes against humanity are all fundamental norms in international law. The concept of universal norms is expanding to address issues that threaten the global environment. Threats such as ozone depletion and ocean pollution endanger the global environment and world population, demanding a set of laws that establish global controls.

While customary international environmental law is not traditionally viewed as jus cogens, significant evidence exists that there is a growing belief in environmental protection as a human right crucial enough to give rise to its own custom. This belief is contained in many recent UN resolutions, international conventions and treaties.

e. Conclusion

Many principles of customary international environmental law can be seen as prohibiting the testing of nuclear weapons. However, none have been particularly directed towards nuclear weapons and the ICJ has not officially decided whether these mechanisms extend to prohibit nuclear testing. The ICJ was provided with the opportunity to examine this question in the French nuclear test case of 1995, but declined to do so on procedural grounds and did not

252. Id.
253. Id.
254. See id.
255. See id.
256. See World Order, supra note 126 at 127 as cited in J. Starke, An Introduction to International Law at 53-54.
257. See id.
258. See Steinfeld, supra note 185, at 1649.
259. See id.
260. See id.
consider the merits of the argument.261

The concept of the protection of the environment is definitely fundamental to the continued existence of humanity. It is such an important concept that many newly arising environmental concepts are rapidly being incorporated into the corpus of international custom. These principles are jus cogens. Nuclear testing violates many of these principles and directly contradicts international law.

VI. Conclusion

Nuclear testing and the development of nuclear weapons have cataclysmic effects on the world's political structure and environment. Further nuclear testing and development should be averted at all costs. Although alone, nuclear and environmental treaties currently in force do not prohibit non-parties from testing and developing nuclear weapons. Considered as a whole, these treaties have created a new international custom against nuclear testing.

The international community has made many efforts over the course of the years to limit nuclear development. However, due to the efforts of many nations to develop and proliferate nuclear technology, there are strong arguments against the creation of a custom prohibiting nuclear development. Obviously, countries that proliferated nuclear technology did not believe that treaties prohibiting nuclear development were binding. Acts of proliferation contrary to treaty provisions undermine the idea that nuclear treaties created a customary prohibition against nuclear development.

On the other hand, the international community has also made many efforts to limit nuclear testing. Every nation that signed a nuclear test ban treaty respected its provisions. The international community believed prohibitions on nuclear testing to be binding. Even when India and Pakistan tested nuclear weapons, they tested them underground and in compliance with their obligations under international law. In that sense, neither country previously objected to any aspect of international law governing nuclear testing. The culmination of the international community's efforts to prohibit nuclear testing occurred at the closing of the CTBT in 1996. At the closing of the CTBT, more nations than ever before simultaneously denounced nuclear weapons testing. A customary prohibition against nuclear testing was created at this time. Pakistan never tested

261. See Nuclear Test Case, supra note 181, at 420.
weapons before this date. India tested one nuclear device. Neither of these acts can be considered to constitute “persistent behavior.” As a result, the exemption of the persistent objector is not available to India and Pakistan. It is irrefutable that nuclear testing violates traditional and newly arising international environmental customs. The ICJ has yet to specifically hold that nuclear testing is prohibited. The ICJ has held that transboundary harm, the precautionary principle and the principle of intergenerational equity are custom. The effects of nuclear testing clearly violate these customs. For this reason, nuclear testing clearly violates international law.

The world is poised on the brink of an unprecedented nuclear era. Many nations will be attaining nuclear technology in the near future and many underground test explosions may occur. Great damage to the environment could ensue unless the international community takes action. There are many nations in the world that are less politically stable than the current nuclear weapons nations and future nuclear conflicts or dissemination of nuclear weapons to radical political groups could result. In this destabilized world future, one thing is certain, the time is ripe for nuclear testing and development to be prohibited completely.