

THE NUCLEAR SUPPLIER GROUP: PROBLEMS AND SOLUTIONS

Kyle Mathis

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INTRODUCTION

There is no reason to wonder why the world would want to control the spread of nuclear weapons. The detonation of nuclear weapons in Japan in 1945 showed the world a weapon that left all of its predecessors in the dust as to pure destructive capability. Since then, the world has seen the advent of a multitude of strategies to try to control this spread or “proliferation” of nuclear weapons. One of the byproducts of controlling this proliferation is closely controlling the spread of the beneficial civilian nuclear energy technologies that closely resemble nuclear weapons programs. However, the current and potential usefulness of nuclear energy is difficult to forget. Since the revelation that obtaining energy from nuclear reactions is possible, scientists and lay people alike have heralded it as the future for world energy. From a humanitarian perspective, nuclear energy has the potential to drastically help the development of underdeveloped nations while helping to curb the environmental problems created by the modern consumption of fossil fuels.

From a scientific perspective, the process to make fuel grade and weapons grade uranium is nearly identical, creating a multitude of dilemmas. Seemingly, the world would like to prevent the further spread of

nuclear weapons;¹ but how can or should this be done? The first thing to be looked into is how, since the advent of the nuclear bomb, the world has been attempting to control the further proliferation of nuclear weapons.

THE DUAL-USE PROBLEM

Before exploring the law and policy surrounding this situation, a quick look into the science at the root of these problems is necessary. The science behind this is complicated, but can be put into layman's terms. Uranium as it naturally occurs is not suitable for use in either civilian or military purposes.² However, it can be converted into a more usable form of the same element.³ Whether looking to make civilian or military use of the uranium, it must be converted to an isotope known as U-235, which is usually done using a centrifuge.⁴ The difference between the two uses is largely in how much of the uranium needs to be this isotope. For civilian purposes you need less than 20% of the fuel to be U235 concentrate, with most nuclear power reactors able to run on closer to 5% U235.⁵ Once the threshold of 20% enrichment is crossed, the sample becomes known as Highly Enriched Uranium (HEU).⁶ HEU does have notable medical uses;⁷ however, for use in nuclear weapons, 20% is still not enriched enough to make an effective weapon.⁸ HEU can produce a crude weapon with as little as 20% U235 enrichment for a low yield nuclear weapon.⁹ True 'weapons grade' U-235 uranium, used to create high yield nuclear weapons, requires 85% U235 enrichment.¹⁰ While the process to reach even 60% from the civilian-necessary 5% is expansive, the technology to reach this higher level of enrichment is identical to what it takes to reach the lower levels of enrichment.¹¹ The point that the uranium is enriched occurs when the technologies begin to separate; however, they do merge again at a later point.¹²

1. As well as chemical and biological, which are both classified with nuclear weapons as Weapons of Mass Destruction, or WMDs. JOSEPH CIRINCIONE ET AL., DEADLY ARSENALS: NUCLEAR, BIOLOGICAL, AND CHEMICAL THREATS 3 (2005).

2. JOSEPH CIRINCIONE ET AL., DEADLY ARSENALS: TRACKING WEAPONS OF MASS DESTRUCTION 38 (2002).

3. *Id.*

4. *Id.* at 38-39.

5. Daniel Joyner, INTERPRETING THE NUCLEAR NON-PROLIFERATION TREATY 4 (2011).

6. *Id.*

7. *Civilian Uses of HEU*, NTI (Nov. 15, 2012), <http://www.nti.org/analysis/articles/civilian-uses-heu/>.

8. See Joyner, *supra* note 5, at 4. Joyner notes that in order to be "weapon-grade" uranium, the enriched uranium must be at a purity of 85%. At only 20% purity, the uranium is "weapons usable," but it will produce only a "crude weapon." *Id.*

9. *Id.*

10. *Id.*

11. See *id.* at 5.

12. CIRINCIONE, *supra* note 2, at 40.

After uranium is used to produce civilian energy, it creates a waste by-product.¹³ Reprocessing of this waste can create fissionable materials for further use in civilian plants.¹⁴ However, it also results in Plutonium—specifically the weapons-grade Plutonium 239 and 240.¹⁵ This makes it possible for a country which has no visible HEU processing for weaponization purposes to use completely civilian processes to create Plutonium for the purposes of creating a nuclear weapon arsenal.

These two points of being able to use apparently civilian technologies to produce nuclear weapons are why these technologies are often referred to as dual-use. The dual-use nature of the technologies is the center of compromises within the treaty on the Non-Proliferation of Nuclear Weapons of 1970 and is the entire reason for the existence of other international groups and treaties. These groups and treaties would become outdated if an effective method of separating the technologies or limiting a nation's abilities to participate in these stages of the production process could be found.

THE INTERNATIONAL FRAMEWORK: THE NPT

The most lasting example of a combined effort to control nuclear proliferation is the Treaty on the Non-Proliferation of Nuclear Weapons of 1970 (also known as the NPT).¹⁶ This treaty is the modern groundwork establishment for the international attempt to control the proliferation of nuclear weapons.¹⁷ The NPT has been both praised and scorned as being a simple document in the way that it is constructed.¹⁸ The NPT categorizes nations into what can be considered the haves and the have-nots. The haves would be the Nuclear Weapon States (NWS), while the have-nots are referred to as Non-Nuclear Weapon States (NNWS).¹⁹ The NPT basically obliges NWS not to transfer any nuclear weapons or the capabilities to make those weapons to any NNWS. As it stands, there are 5 signatory NWS: China, United States, Russia, France, and the United Kingdom.²⁰

13. *Id.*

14. ANTHONY ANDREWS, CONGRESSIONAL RESEARCH SERVICE, RS22542, Nuclear Fuel Processing: U.S. Policy Development (2008), available at <http://www.fas.org/sgp/crs/nuke/RS22542.pdf>

15. Ciricione, *supra* note 2, at 40.

16. Treaty on the Non-Proliferation of Nuclear Weapons, opened for signature July 1, 1968, 21 U.S.T. 483, 729 U.N.T.S. 161.

17. Treaty on the Non-Proliferation of Nuclear Weapons (NPT), <http://www.un.org/disarmament/WMD/Nuclear/NPT.shtml> (last visited June 25, 2013).

18. Michael A. Levi, *Copenhagen's Inconvenient Truth: How to Salvage the Climate Conference*, FOREIGN AFFAIRS, Sept.-Oct. 2009, at 92, 100.

19. Treaty on the Non-Proliferation of Nuclear Weapons, *supra* note 16.

20. U.S. Delegation to the 2010 Nuclear Nonproliferation Treaty Review Conference, TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS n.1 (2010), <http://www.state.gov/documents/organization/141503.pdf>.

These five states, however, do not resemble the full range of states that hold nuclear weapons capability. Instead, it is only those who had tested a nuclear weapon by March of 1970 (the date when the treaty came into being).²¹ It is also worth noting that the five NWS are also the five countries that hold permanent seats on the United Nations Security Council;²² this may or may not be significant, but it could be viewed by some as the rich getting richer.

To date, the NPT stands as the main legal framework concerning the international proliferation of nuclear weapons. As earlier described, it classifies states into statuses as either NWS or NNWS. However, not only does the NPT classify states based on their nuclear status, but also it assigns them responsibilities based on their classifications. These responsibilities are best laid out one section at a time.

Article I of the NPT obliges all NWS not to transfer nuclear weapons or technologies to NNWS. Likewise Article II obliges NNWS not to receive nuclear weapons or acquire them by any other means.²³ Article III implements safeguards through the International Atomic Energy Agency (IAEA), which ideally will prevent civilian nuclear programs from becoming military.²⁴ Article IV affirms that nothing within the NPT is meant to prevent a compliant state from obtaining civilian nuclear technologies.²⁵ Article V obliges all states to share information which will help further civilian nuclear development, with the main objective of having NWS assist NNWS who desire civilian nuclear programs in developing those programs.²⁶ Article VI requires NWS to make good faith efforts toward eliminating their nuclear weapon stockpiles.²⁷ While further articles exist in the NPT, the first six compose the bulk of the bargain struck between NWS and NNWS in getting this international standard put into place.

THE NSG: BULLIES OR GUARDIANS?

“Shortly after entry into force of the NPT in 1970, multilateral consultations on nuclear export controls led to the establishment of two separate mechanisms for dealing with nuclear exports: the Zangger Committee in 1971 and what has become known as the Nuclear Suppliers Group in 1975.”²⁸ Founded as a response to the Indian Nuclear tests in 1974, the

21. *See id.*

22. *Current Members*, U.N. SEC. COUNCIL [SCOR], <http://www.un.org/en/sc/members/> (last visited Jun. 12, 2011).

23. Treaty on the Non-Proliferation of Nuclear Weapons, *supra* note 16, 21 U.S.T. at 487.

24. *Id.*

25. *Id.* at 489. Article 4 of the NPT has also been one of the biggest problems in the modern conflicts with Iran concerning its nuclear programs.

26. *Id.* at 490.

27. *Id.*

28. *Information Circular: Communication of 1 October 2009 received from the Resident Repre-*

Nuclear Suppliers Group (NSG)—much like the still-present Zangger Committee—serves as a prime example of a multilateral export regime.²⁹ This means that the NSG consists of a group of nations working in concert to control the export of certain materials from their country.³⁰ The NSG is one of the main ways that nations are prevented from obtaining nuclear technologies as well as dual-use technologies.

The basic structure of the NSG is based around a list of strictly controlled items that participating nations agree to closely monitor and control the movement of. According to their own website, the NSG guidelines “facilitate the development of trade in this area by providing the means whereby obligations to facilitate peaceful nuclear cooperation can be implemented in a manner consistent with international nuclear non-proliferation norms.”³¹ However, there are very few actual norms in place, as every country that participates as a part of the NSG is able to do so in its own way. The easiest example to use would be the United States.

The United States’ limitations on exports are two-pronged and were established in 1979 by the Export Administration Act (EAA).^{32,33} The EAA specifically looks to control the export of items that play a role in dual-use technologies. The EAA puts much of the export controls into the hands of the Department of Commerce’s Export Administration Regulations (EAR).³⁴ The EAR consist of a Commerce Control List of approximately 2400 dual-use items.³⁵ This list closely mirrors the list that can be found in the “guidelines” of the NSG.³⁶ In fact, most participating coun-

sentative of Hungary to the Agency on Behalf of the Participating Governments of the Nuclear Suppliers Group, Int’l Atomic Energy Agency [IAEA], IAEA Doc. INFCIRC/539/Rev.4 at 2 (Nov. 5, 2009), available at <http://www.nuclearsuppliersgroup.org/Leng/PDF/infirc539r4.pdf>.

29. The key difference between these seemingly identical organizations lies in the Zangger Committee being limited to only those members who have signed on to the NPT, as well as the NSG’s decision to restrict export of dual-use technologies in the 1990’s. *See id.* at 3–5.

30. There were forty-six members of the NSG as of 2009, with China being the most recent addition in 2004. *Who are the Current NSG Participants?*, NUCLEAR SUPPLIERS GROUP, <http://www.nuclearsuppliersgroup.org/Leng/03-member.htm> (last visited Jun. 12, 2011).

The European Commission participates as an observer, and as early as 2010, both the United States and France have voiced support for the addition of India as a member of the NSG, as well as several other international organizations in “a phased manner.” *Obama Seeks Expanded US-India Trade*, ALJAZEERA, Nov. 7, 2010, <http://english.aljazeera.net/news/asia/2010/11/2010116132349390763.html>; *India and France Hold Key Nuclear Talks* BBC NEWS: SOUTH ASIA (Dec. 6, 2010), <http://www.bbc.co.uk/news/world-south-asia-11924016>.

31. *What are the Guidelines?*, NUCLEAR SUPPLIERS GROUP, <http://www.nuclearsuppliersgroup.org/Leng/02-guide.htm> (last visited Jun. 11, 2011).

32. DANIEL H. JOYNER, INTERNATIONAL LAW AND THE PROLIFERATION OF WEAPONS OF MASS DESTRUCTION 126–27 (2009).

33. DANIEL H. JOYNER, INTERNATIONAL LAW AND THE PROLIFERATION OF WEAPONS OF MASS DESTRUCTION 126–27 (2009).

34. *Id.*

35. *Id.*

36. *See Information Circular: Communication Received from Certain Member States Regarding Guidelines for Transfers of Nuclear-related Dual-use Equipment, Material, Software and Related Technology*, IAEA, IAEA Doc. INFCIRC/254/Rev.8/Part2, at i [hereinafter IAEA], available at:

tries use the exact list provided by the NSG or one that is very similar to it in substance when determining what items are controlled.³⁷ In the United States, every item on the Commerce Control List has an Export Control Classification Number (ECCN), which corresponds to a chart that displays which countries are allowed to receive items based on the item's ECCN.³⁸

Thus, when contemplating the export of a good or technology item, a U.S. individual or business must first classify the commodity to be exported . . . and thereby determine the commodity's Export Control Classification Number. From there, the individual . . . must examine the country charts...and find the country to which its item is destined . . . [and] determine whether or not a license must be first obtained from BIS before the item can in fact be exported. This process, while time consuming and complex, does provide a fairly systematic and predictable method for . . . classification.³⁹

It does hold true that this provides a level of predictability to a problem that is plagued with underlying difficulties. However, the benefits of a structure like this depend on the members of the multilateral regime to uphold it. A starting point is that there is no model list of countries in the NSG "guidelines" the way there is for the technologies.⁴⁰ Instead, it would appear that this is one of the more discretionary elements of the NSG, which would then seem to make it possible for different countries to implement different understandings of which nations are and are not potential nuclear threats. Additionally, the qualifications for membership into the NSG are less than clear.⁴¹ There are non-member nations, such as India, which have nuclear weapons that are completely usable, while most member states such as Italy and Japan do not possess nuclear weapons capabilities.⁴² While it is understandable that it is technically the control of nuclear and dual-use technologies that highlight the NSG's purpose, it would seem that the control of technologies would be best served if all nations that possessed nuclear weapons and were willing to join did so.⁴³ What then

<http://www.nuclearsuppliersgroup.org/Leng/PDF/infirc254r8p2.pdf>.

37. See *Commerce Control List Overview and the Country Chart*, BUREAU OF INDUS. & SEC. (July 23, 2012), http://www.bis.doc.gov/policiesandregulations/ear/738_supp1.pdf.

38. *Id.*

39. JOYNER, *supra* note 33, at 127.

40. See *What are the Guidelines?*, *supra* note 31.

41. See *Who are the Current NSG Participants?*, *supra* note 30.

42. However, both Italy and Japan do possess civilian nuclear programs.

43. These frustrations concerning India present one of the key difficulties of the NSG that will be examined in the next section through a contemporary case study of the exemption waiver granted to India in 2008 by the NSG.

allows a nation to participate in the NSG? According to the NSG website include such elements as:

- The ability to supply items;
- adherence to the NSG guidelines;
- enforcement of domestic guidelines;
- adherence to the NPT⁴⁴; and
- support of international efforts towards non-proliferation of nuclear weapons.⁴⁵

Participation requirements reflect a feeling within the NSG of sticking to the status quo. This adherence to the status quo by the NSG as an organization is best demonstrated by the fact that the group was almost completely inactive for thirteen years, making no changes to the NSG item trigger list or even meeting between 1978 and the early 1990s.⁴⁶ “[T]he major cause of the group’s inactivity was the unwillingness of some NSG suppliers to move beyond the conditions for nuclear exports established in 1977. The motive behind this unwillingness was commercial interest.”⁴⁷ Beginning with thirteen years of silence directly following its creation and moving into the decisions it has made more recently, it is definitely a colorable argument that this was not the first or last decision made by the NSG with commercial interest in mind.

The catalyst that ended this thirteen-year silence also is what has ultimately caused the decision that clouds the NSG with so much controversy. The discovery of a clandestine nuclear facility in Iraq, a party to the NPT, encouraged the participants of the NSG to come back together in an attempt to prevent a repeat of what happened in Iraq.⁴⁸ Iraq had been able to construct their facilities largely without purchasing any item that would trigger the NSG export control’s trigger list.⁴⁹ Instead, they had been purchasing dual-use technologies, often openly from legitimate western businesses, and at other times through covert, indirect acquisition.⁵⁰ Iraq had been using the dual-use technologies that it obtained to self-fabricate the

44. Not entirely accurate as France was a part of the NSG upon its inception but did not accede to the NPT until 1992. See *The Nuclear Information Project: Treaty on the Non-Proliferation of Nuclear Weapons (NPT)*, FED’N OF AM. SCIENTISTS [FAS], <http://www.fas.org/nuke/control/npt/> (last visited July 10, 2011).

45. *Who are the Current NSG Participants?*, *supra* note 30.

46. Tadeusz Strulak, *The Nuclear Suppliers Group*, 1 THE NONPROLIFERATION REVIEW, no. 1, 1993, at 1, 3.

47. *Id.* at 3.

48. See Daniel H. Joyner, *The Proliferation Security Initiative: Nonproliferation, Counterproliferation, and International Law*, 30 YALE J. INT’L L. 507, 516 (2005).

49. Strulak, *supra* note 45, at 4

50. See *id.*

nuclear technologies it desired and would likely have been unable to get directly due to export regime guidelines from groups such as the NSG.⁵¹

This incident brought into public view the potential threat caused by dual-use technologies. Based on this revelation, the NSG decided at its March 1991 meeting at the Hague to bring the NSG trigger list up to date. The trigger list was updated by adding those technologies that had been added to the consistently updated Zangger Committee list during the NSG's thirteen-year period of inactivity.⁵² However, this was not the biggest decision of the Hague meeting. The biggest accomplishment was a decision to "create a supplementary regime within the NSG framework to control exports of nuclear related dual-use materials and technology."⁵³ What is now referred to as NSG Part II consists of guidelines concerning the transfer of all dual-use nuclear technologies as well as a list of items that notably includes dual-use technology and equipment.⁵⁴ It is this more recent list that is at the heart of many concerns in circles of both policy and law.

WHAT TYPE OF PROLIFERATION TO CONTROL

The term proliferation can actually be separated into three distinct categories.⁵⁵ First is vertical proliferation.⁵⁶ This can generally be described as internal proliferation, or one nation's attempt to increase its nuclear programs and stockpiles once these programs and stockpiles are already in existence.⁵⁷ Many fears can come from this type of proliferation. During the Cold War, it became a race for countries with nuclear weapons (namely the United States and Soviet Union) to stockpile as many nuclear weapons as possible.⁵⁸ In a contemporary sense, we usually see this from a framework of convincing those states that have already amassed a stockpile to dismantle what is already in place. However, more alarming for this type of proliferation is the ability for those nations that have begun research on seemingly innocent civilian nuclear programs to decide to take the few necessary steps

51. See Christopher Clary, *A.Q. Khan and the Limits of the Non-Proliferation Regime*, 4 DISARMAMENT FORUM 33, 33–42 (2004).

52. See Strulak, *supra* note 45, at 4.

53. JOYNER, *supra* note 33, at 31.

54. See IAEA *supra* note 36, *passim*.

55. See Gabriella Venturini, *Control and Verification of Multilateral Treaties on Disarmament and Non-Proliferation of Weapons of Mass Destruction*, 17 U.C. DAVIS J. INT'L L. & POL'Y 345, 347 (2011).

56. See David A. Kaplow, *Parsing Good Faith: Has the United States Violated Article VI of the Nuclear Non-Proliferation Treaty?*, 1993 WIS. L. REV. 301, 313–14 (1993) (defining vertical proliferation as "the intensification—the qualitative improvement and the quantitative growth—of the nuclear arsenals of the [nuclear weapon state]").

57. See Helen M. Cousineau, *The Nuclear Non-Proliferation Treaty and Global Non-Proliferation Regime: A U.S. Policy Agenda*, 12 B.U. INT'L L. J. 407, 410 (1994).

58. See Venturini, *supra* note 55, at 347.

to weaponize these programs. The best contemporary example of this would be the struggles we see with Iran.

The alternative to vertical proliferation and second category of proliferation is no surprise: horizontal proliferation.⁵⁹ This constitutes the spread of nuclear weapons and programs to countries that did not already possess them.⁶⁰ Control of both has been a legitimate concern since the advent of the nuclear weapon. However, it is fear of horizontal proliferation to unstable countries that has prompted the harsh restrictions of the NPT and NSG when it comes to supporting the nuclear advancement of NNWS.

There is a third type of proliferation, non-state actor proliferation.⁶¹ Non-state actor proliferation constitutes the spread of nuclear technologies and weapons to non-state actors.⁶² This problem—one which has emerged post-Cold War—mainly concerns nuclear, chemical, and biological weapons falling into the hands of terrorist organizations.⁶³ What makes this type of proliferation so troubling is that standard international checks on the movement of nuclear materials which rely on pressuring states into acting in conformity with laws are largely ineffective on non-state actors which do not have the same standard concerns as would a state actor. Dealing with potential proliferation to non-state actors is one of the newest and most urgent problems the world faces today. While this type of proliferation may have the potential to be the most dangerous, it is also the hardest to control and possibly the least immediate threat. To date, the instances of Weapons of Mass Destruction (WMD) being used as a part of terrorist attacks remain few and far between, with no nuclear weapons used in terrorist attacks to date. While one attack would no doubt completely shift this mindset, it remains that for now other concerns can be more easily addressed.

Between horizontal and vertical proliferation, the media seems more focused on the one that we cannot really do anything substantial about. Once a country has been brought into the circle via horizontal proliferation and begins internal expansion through vertical proliferation, stopping the process becomes much harder. Our main nuclear concerns today seem to be North Korea and Iran, but some experts would say that we are too late on these fronts and should move our sights forward to problems that we can actually stop:

Since it is likely too late to reverse the nuclear ambitions of North Korea and Iran, the United States and its partners should also stop

59. *Id.*

60. *Id.*

61. *See id.* at 347–51.

62. *Id.* at 351, 376.

63. *Id.*

fixating on negotiations with them. Instead, they should concentrate on containing the regional effects of these states' nuclear programs while creating the conditions for rolling them back should future leaders prove more responsive to inducements and pressure.⁶⁴

The contentions of Mr. Schulte here seem sound. It is in reality too late to effectively stop Iran from possessing a nuclear weapon, should that be their actual goal. As for North Korea, all signs show that they are already in possession of this weapon,⁶⁵ so trying to prevent them from growing internally would seem to be little more than a waste of time. Instead, our concern should be horizontal proliferation that may result from these nations' possession of nuclear weapons.⁶⁶

BLEMISHES: THE U.S.-INDIA CIVIL NUCLEAR AGREEMENT AND THE A.Q. KHAN PROLIFERATION RING

Even with thirteen years of inactivity, the NSG has managed some to find itself involved in some less-than-appealing situations of late involving India and Pakistan.

Since India first tested a nuclear weapon in 1974 there has been much tension in South Asia. This tension has occurred specifically between constant rivals India and Pakistan, prompting President Bill Clinton in 1999 to dub this area "the most dangerous place on Earth."⁶⁷ However, even with such a moniker, it is difficult to ignore the fact that an enormous portion of the world's population exists in India alone. With such a large population comes the potential for staggering energy needs. India, however, has not to date signed on to the NPT, even though India remains to date one of the few countries in the world with nuclear weapon technologies.⁶⁸

64. Gregory L. Schulte, *Stopping Proliferation Before It Starts: How to Prevent the Next Nuclear Wave*, FOREIGN AFFAIRS, July–August 2010, at 85, 86.

65. North Korea recently conducted its third test of a miniaturized nuclear weapon on February 12, 2013. Gloria Riviera, *North Korea Says it Has Successfully Conducted a Nuclear Test*, ABC NEWS (Feb. 12, 2013), <http://abcnews.go.com/International/north-korea-says-successfully-conducted-nuclear-test/story?id=18444191>.

66. Some may even be willing to contend that the very problems we are having with nations such as Iran are due to inefficiencies in selectively allowing nations to possess nuclear weapons, Israel being a prime example. Similarly, some may contend that Israel's possession of advanced military technologies, including nuclear technologies, coupled with their past showings of willingness to attack other nation's nuclear facilities may be enough to deter Iran from possessing a nuclear weapon. See Dalia Dassa Kaye & Frederic Wehrey, *Containing Iran?: Avoiding a Two-Dimensional Strategy in a Four-Dimensional Region*, THE WASHINGTON QUARTERLY, July 2009, at 37, 49.

67. NATHAN E. BUSCH, NO END IN SIGHT: THE CONTINUING MENACE OF NUCLEAR PROLIFERATION 175 (2004). The author stresses that having two neighboring, contentious, and unstable countries in possession of nuclear weapons has made for a delicate political situation in South Asia. *Id.*

68. India is part of a group with Israel, Pakistan and North Korea that possess nuclear weapons but

Beginning in 2005, leadership of the United States and India began talks by which India would agree to separate their civilian nuclear facilities and weapon nuclear facilities and place the civilian facilities under full International Atomic Energy Agency (IAEA) safeguard.⁶⁹ In exchange, the United States agreed to work toward full nuclear cooperation with India.⁷⁰ Such action required approval from the IAEA as well as a waiver from the NSG for the United States to be able to legally provide India with these technologies under NSG protocols.⁷¹ In 2008 in an unprecedented step, the NSG approved the waiver for India even though India had not signed on to the NPT.⁷²

This action on the parts of both the United States as an individual state and the NSG as a group has been criticized heavily over the past few years. One major criticism has come based on the knowledge that this cooperation with India on the part of the United States came directly in the wake of China being given participant status in the NSG.⁷³

Beginning in the late 1990s, a discovery began coming to light that shocked the international community and made multilateral export regimes such as the NSG look inept. Dr. Abdul Qadeer Khan, who served as director of the Pakistani Kahuta Research Laboratories from 1976 to 2001 and is known as the father of Pakistan's uranium enrichment program, was alleged to have been exporting Pakistani nuclear technologies to places such as Iraq, North Korea, Iran, and Libya.⁷⁴ While allegations concerning Iraq began as early as 1998, it took an internal investigation by the Pakistani government to get Khan to confess publicly that he had been running a proliferation ring.⁷⁵

"The most disturbing aspect of the international nuclear smuggling network headed by [Khan], widely viewed as the father of Pakistan's nuclear weapons, is how poorly the nuclear nonproliferation regime fared in

are currently not in the NPT, with North Korea dropping out in 2003 and the other three countries never signing on.

69. Press Release, Office of the Press Secretary, Joint Statement Between President George W. Bush and Prime Minister Manmohan Singh (July 18, 2005), available at: <http://georgewbush-whitehouse.archives.gov/news/releases/2005/07/20050718-6.html>.

70. Maria Sultan & Mian Behzad Adil, *The Henry J. Hyde Act and the 123 Agreement: An Assessment*, SOUTH ASIAN STRATEGIC STABILITY INSTITUTE, (September 2008), available at <http://www.sassu.org.uk/pdfs/The%20123%20Agreement%20and%20Hyde%20Act.pdf>.

71. See Kate Heinzelman, Note, *Towards Common Interests and Responsibilities: The U.S.-India Civil Nuclear Deal and the International Non-Proliferation Regime*, 33 YALE J. INT'L L. 447, 450-51 (2008).

72. See *id.* at 451.

73. See Mark Hibbs, *The Breach*, FOREIGN POLICY (June 4, 2010), http://www.foreignpolicy.com/articles/2010/06/04/the_breach. This is especially remarkable considering the deal that China had recently cemented with Pakistan to supply them with nuclear reactors.

74. See David Albright & Corey Hinderstein, *Unraveling the A.Q. Khan and Future Proliferation Networks*, THE WASHINGTON QUARTERLY, Spring 2005, at 111, 111.

75. *Id.* at 116.

exposing and stopping the network's operation."⁷⁶ It is speculated that without the assistance of Khan, countries such as Iran would not have been able to enrich uranium using gas centrifuges.⁷⁷ Khan was able to succeed by exploiting the holes in export control systems, even recruiting smugglers from countries that were participants in the NSG.⁷⁸ The main customers of Khan's proliferation ring were countries that were unsatisfied with the way the NSG controlled the market and thus were driven to violate the NPT.⁷⁹ Some of these same countries are still threats of continuing trends of horizontal proliferation through smuggling to those countries whose relationship with the NSG is less than sparkling.

COUNTER-PROLIFERATION

In contemporary society, methods of preventing the spread of nuclear weapons and pushing back what is already in place are referred to as counter-proliferation.⁸⁰ Counter-proliferation methods include techniques such as containment, deterrence, border controls, economic sanctions, and preemptive military strikes.⁸¹ Each of these tactics has been attempted in the past and will be attempted in the future; however, on a larger scale it would seem that no matter the techniques used, countries are still able to obtain nuclear technologies should they so desire.⁸²

Questions about the legality of counter-proliferation, on an international level, fall into the category of International Use of Force Law (*Jus ad bellum*), the main source of which can be found in the charter of the United Nations.⁸³ One example of counter-proliferation policy that has come under scrutiny as to its legality under International Use of Force Law is the Proliferation Security Initiative (PSI).⁸⁴ The main goal of the PSI was to attempt to intercept nuclear materials when they are most vul-

76. *Id.* at 111.

77. *See id.*

78. *Id.* at 120.

79. *See id.* at 112.

80. *See Joyner, supra* note 48, at 520.

81. Different counter-proliferation techniques demonstrate different levels of aggressiveness and likewise different levels of past effectiveness. While it is widely accepted that containment and deterrence are ineffective in preventing horizontal proliferation, recent history has shown the others; border controls through the Counter security initiative, Economic Sanctions in the UN's dealings with Iran, and Pre-emptive military strikes in Israel's bombing of facilities in Iraq and Syria as well as the invasion of Iraq in 2003. James R. Holmes & Andrew C. Winner, *The Proliferation Security Initiative*, in *COMBATING WEAPONS OF MASS DESTRUCTION: THE FUTURE OF INTERNATIONAL NONPROLIFERATION POLICY* 139-55 (Nathan E. Bush and Daniel H. Joyner, eds., 2009); *see also* M. Elaine Bunn, *Force, Preemption, and WMD Proliferation*, in *COMBATING WEAPONS OF MASS DESTRUCTION: THE FUTURE OF INTERNATIONAL NONPROLIFERATION POLICY* 156-74 (Nathan E. Busch and Daniel H. Joyner, eds. 2009).

82. The key example has been the ability of Iran and North Korea to advance their nuclear programs, although some may classify these as rogue states that cannot be effectively deterred.

83. U.N. Charter Ch. VII.

84. Holmes & Winner, *supra* note 81, at 139.

nerable, during transport.⁸⁵ The logic goes that, as it is difficult to get to technologies that are being hidden and stored, the easiest way to prevent their illegal spread is by intercepting them while in transit, whether said transit is by land, air, or sea. The PSI is not a part of any existing treaty or international organization, but is instead the effort of coordinating adherents trying to interdict WMD materials.

Efforts such as the PSI resemble an alternative of sorts to the NSG. While NSG countries such as the United States often are key implementers of these counter-proliferation methods.⁸⁶

WHAT IS THE PROBLEM?

Much of the world could and should benefit from the existence of nuclear power plants within their own borders. Nuclear energy promises energy that is cheap and efficient when compared to the contemporary alternatives. However, starting up a new nuclear program in a country and moving forward with it requires the blessing of the membership of the NSG. For those countries with the ability to bring something to the table this is fine, but many nations are left at the whim of those who have more power.⁸⁷ This policy of allowing countries to pick and choose those that are allowed to receive the benefits of nuclear power is in direct conflict with modern international law as established by the NPT.⁸⁸ Article IV of the NPT states that “[n]othing in this Treaty shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination .”⁸⁹ This does not seem to be the world’s present course of action under the modern non-proliferation regime. The desire of all states to prevent the spread of nuclear weapons is more than understandable; however, this cannot be done at the peril of the spread and development of civilian nuclear programs. A key modern example that can again be brought up is that of Iran. Iran makes claims that are absolutely within its rights under the NPT—that as a nation it is seeking to produce civilian nuclear energy.

85. Lee Michael Katz, *Counterproliferation Program Gains Traction, But Results Remain a Mystery*, NTI (Dec. 10, 2010), <http://www.nti.org/gsn/article/counterproliferation-program-gains-traction-but-results-remain-a-mystery/>.

86. It was the United States that was most active in trying to find evidence against Khan and eventually was directly involved in the interception of nuclear supplies bound for Libya in October of 2003. Albright & Hinderstein, *supra* note 74, at 111.

87. For example, India was able to clear NSG hurdles with more efficiency despite its track record because of a beneficial relationship with the United States. Sultan and Adil.

88. This of course relies on a view that international law exists and that a realist view of international law and politics is incorrect.

89. Treaty on the Non-Proliferation of Nuclear Weapons, *supra* note 18, 21 U.S.T. at 489.

While Iran's rights are clear in its being allowed to have civilian nuclear technologies, it has also been less than open about its attempts to develop these technologies. However, with the constant knowledge that countries which have no real duties to you are breathing down your neck, as an independent nation, it is difficult to believe that Iran would desire being completely forthcoming about the situation. It is tangled messes like the one in Iran that drive a need to find a more efficient method for controlling the movement of nuclear weapons.

FINDING SOLUTIONS IN FUEL BANKS

Contemporary society has seen the emergence of states that have chosen to produce their own nuclear energy without possessing the capability to enrich Uranium domestically.⁹⁰ Instead, these nations have turned to purchasing their nuclear fuel rods either from nations which already possess the necessary technologies, or from private fuel banks such as URENCO.⁹¹ In addition to URENCO, there has been a more recent emergence of an attempt to have a fuel bank controlled directly by the IAEA.⁹²

While labeled as private, URENCO is actually owned in equal parts by subsidiaries of the Dutch, British, and German governments.⁹³ This tie to the governments of nations that are typically classified as among the leaders of the world does not help the reputation of a company like URENCO, which many nations already oppose for various reasons.⁹⁴ While this solution does provide a potentially game-changing alternative to the current problem of states potentially using enrichment facilities to produce Highly Enriched Uranium, it does not solve the issue of sovereignty, which is often the cause of a nation's desiring such plants. Privatization of production is not always desirable by all involved. So then, what if an IO got involved?

90. Cole J. Harvey, *From Theory to Reality: The Evolution of Multilateral Assurance of Nuclear Fuel*, NTI (March 24, 2011), <http://www.nti.org/analysis/articles/evolution-multilateral-assurance-nuclear-fuel/>.

91. See *About URENCO*, URENCO, <http://www.urengo.com/page/2/About-URENCO.aspx> (last visited June 26, 2013). Several countries currently possess nuclear energy reactors without the domestic capability to enrich Uranium. *Id.*

92. See Press Release, IAEA, IAEA Seeks Guarantees of Nuclear Fuel (Sep. 15, 2006), available at <http://www.iaea.org/newscenter/pressreleases/2006/prn200615.html>.

93. The three parts are: Ultra-Centrifuge Nederland (owned by the Dutch Government); Uranit GmbH (owned by German energy companies); and Enrichment Holdings Ltd. (owned by the British government). *Government's £16bn Sale of Assets*, BBC NEWS (Oct. 11, 2009), http://news.bbc.co.uk/2/hi/uk_news/politics/8301787.stm.

94. The main public opponents of fuel banks such as URENCO tend to be outspoken members of the Non-Aligned Movement, or NAM, which will be discussed in its own right in the next section. *The Non-Aligned Movement: Description and History*, NON-ALIGNED MOVEMENT, <http://www.nam.gov.za/background/history.htm> (last visited June 26, 2013).

In December of 2010, the IAEA Board of Governors voted to establish a “global nuclear fuel bank aimed at providing an alternative to countries seeking producing [sic] their own nuclear fuel.”⁹⁵ This movement is younger but is backed by both private and government investors in an attempt to better control the spread of nation’s fuel enrichment technologies.⁹⁶ The structure of this fuel bank would seemingly be similar to the private fuel banks run by the likes of URENCO; however, it would be in the hands of a multilateral international organization and not a private company.

The involvement of the IAEA may provide one of the clearer solutions to the international problem. If faced with the possible middle ground solution of having an equal share with every other country in the IAEA in the products of the IAEA’s fuel banks, nations may be more receptive to the idea of obtaining enriched uranium for energy purposes from a common fuel bank. As this is a fairly new initiative, little has been written, but it would seem that if this idea catches steam, the IAEA could potentially locate facilities in multiple nations, alleviating the concerns of one nation being able to take over the facilities at will. While this is not the only possible solution, it may serve as a good one.

THE VIEWS OF THE NON-ALIGNED MOVEMENT

The Non-Aligned Movement (NAM) is a group of nations who, by their own definition, are not aligned formally with or against any of the major world power blocs.⁹⁷ This is interesting as most of the world’s countries are either members or enjoy observer status as a part of the Non-Aligned Movement.⁹⁸ NAM can also be summed up in part as those who have not been the traditional powers of the 20th century.

The NAM is understandably not a supporter of many of the actions of the NSG, nor have they shown much support for the idea of fuel banks.⁹⁹ This same frustration can be seen in the way NAM countries view the NSG as a whole. Since the inception of the NSG, “[t]he measures brought about protest and suspicions of non-aligned States not represented in the Group.”¹⁰⁰

95. *IAEA Approves Global Nuclear Fuel Bank*, WORLD NUCLEAR NEWS (Dec. 6, 2010), http://www.world-nuclear-news.org/ENF-IAEA_approves_global_nuclear_fuel_bank-0612105.html.

96. Notable investors include the US based Nuclear Threat Initiative, the EU, Kuwait, and Billionaire Warren Buffet. *Id.*

97. *The Non-Aligned Movement: Description and History*, *supra* note 92.

98. This notably includes almost all of Africa, South America, the Middle East and South/East Asia. *The Non-Aligned Movement: Member States*, NON-ALIGNED MOVEMENT, <http://www.nam.gov.za/background/members.htm> (last visited June 23, 2011).

99. See Thomas Lorenz & Joanna Kidd, *An Uncertain Future for International Fuel Banks*, BULL. OF THE ATOMIC SCIENTISTS, May 2010, at 44, 45-46.

100. CLAUDIA KISSLING, CIVIL SOCIETY AND NUCLEAR NON-PROLIFERATION: HOW DO STATES

A COMPLETE BAN

A stricter take on the issue supports a complete ban of the sale of enrichment and process materials. One author goes so far as to label the NSG a cartel that continues to allow the sale and spread of dual-use nuclear technologies out of a desire to expand their own profits.¹⁰¹ The first thing that is noteworthy in such an approach is that the NSG has no authority to completely ban the spread of civilian nuclear technologies according to the NPT. Under Article IV of the NPT, all countries have a right to civilian nuclear programs as long as they do not attempt to produce weapons programs.¹⁰² Given such, a complete ban on the sale or spread of nuclear enrichment and processing materials is simply not a viable legal possibility.

However, what if it were? Questions concerning amending the NPT have been circling since its inception. In fact, the very text of the treaty calls for a meeting every five years after its signing to discuss whether the treaty should in fact be altered.¹⁰³ This shows that those who drafted it were more than aware of the reality that a changing national landscape would necessitate updating of the document. However, as it stands, the NPT seems to speak loudly on this issue, and therefore—from a legal standpoint—there is no means for a complete ban on the proliferation of nuclear technologies or dual-use technologies.

WHERE IS THIS GOING?

A realist looking at the issue would say that nothing is going to change, and at points they are probably correct. The non-proliferation regime under the NPT effectively creates a group of haves and a group of have-nots. As usual in such situations, the haves also control the reigns. International law, much like domestic, is created by those in control. This means that, just as those in control have seen and fixed legal injustices in their own systems, it may in fact be time to see those with the true power step up internationally and make moves towards balancing the playing field with concern to the movement of dual-use nuclear technologies.¹⁰⁴

One of the better solutions out there to the bilateral system created by the NSG is what is currently being presented by the IAEA. A fuel bank

RESPOND? 34–35 (2008).

101. One pair of authors goes so far as to reference the NSG as a cartel. Frank Procida & Peter Huessy, Letter to the Editor, *Unclear Nuclear Logic?*, FOREIGN AFFAIRS, March–April 2009, at 170.

102. Treaty on the Non-Proliferation of Nuclear Weapons, *supra* note 16, at 21 U.S.T. 489.

103. *Id.* at 492.

104. However, as the nations with power are in reality the NWS, it is about as likely that we will see them give up these reigns as it is that we will see these same five nations give up their permanent security council seats in the United Nations.

run by an international organization may help alleviate some of the non-aligned movements' tension over the private fuel banks.

If a solution such as this does not work, the ultimate need may be more transparency on the part of those nations in the world we consider the "haves" when dealing with the "have-nots" on matters of nuclear imports. Keeping a nation from having the nuclear energy access it desires is clearly in violation of the NPT. Therefore, the real obligation of the NSG needs to be finding a way to conform the nuclear power wants and needs of emerging states to the valid concerns of those states creating nuclear weapons. Ideally, this transparency would come with an opening of the doors of the NSG to be more all-encompassing. Perhaps even a better collaboration of the head-butting forces of the NSG and NAM, although this is unlikely. Unfortunately, all of this is just speculation into international law and politics, and a realist perspective would inform anyone that as long as the "haves" of the world remain in power, then the status quo is unlikely to change.

