

## CHAPTER 1

### INTRODUCTION: NUCLEAR ENERGY'S SECURITY STORY

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Governments have funded most of the nuclear industry's research and development, financed or guaranteed loans for its construction and export of nuclear plants, capped its liability for off-site damages in the case of nuclear accidents, and promoted its development internationally. Throughout, officials have insisted that the dangers of nuclear weapons proliferation attendant to the further spread of nuclear energy programs are manageable.

This view is fortified with a narrative. A sharp line is drawn between boiling water and making nuclear fuel. The nuclear weapons risks attendant to nuclear power are marginalized, whereas those related to making nuclear fuel are recognized. Nuclear supplier states, it is argued, though, should be able to persuade their nonweapons state customers not to make nuclear fuel because this activity is expensive and complex. Future nuclear plants also can be made more proliferation-resistant. The narrative then emphasizes the utility of International Atomic Energy Agency (IAEA) safeguards. These can be strengthened to deter and detect most of what matters, and what they cannot deter or detect, it is argued, can be countered. How? This can be accomplished with more timely intelligence to support covert national operations, which the United States and other like-minded states can be counted to take against Nuclear Nonproliferation Treaty (NPT) violators. Finally, although several more

countries are certain to acquire nuclear weapons, this will not matter, it is argued, since nuclear weapons are not militarily useful except to deter use, a mission that these weapons can easily accomplish.<sup>1</sup>

This is the complete proliferation narrative. Although not every nuclear proponent makes it, all of these arguments are now, in one fashion or another, made by industry, academics, and public officials. It is powerful and bolsters nuclear power's further expansion. Indeed, so far, no real counternarratives, only counterpoints (i.e., qualifications), have yet been offered to challenge this upbeat view. Some have noted that truly proliferation-resistant reactors and fuel cycles are not yet at hand, that what has been proposed is unlikely to work, and that nuclear power is currently too expensive to be practical.<sup>2</sup> Yet, the rejoinder to these counterpoints—that in time, affordable proliferation-resistant systems will be developed—has been easy to make. A true counternarrative would be more difficult to deflect. It would show how the truth is actually the opposite of each of the nuclear security points made herein. Again, such a counternarrative has not yet been offered.

This volume is designed to do so. It features research my center commissioned over a 2-year period to reassess the assumptions currently driving U.S. and international nonproliferation policies. It spotlights the analysis and insights of some of the world's top security scholars.

The first section, "Nuclear Proliferation Matters," features the work of François Heisbourg, chairman of the International Institute for Strategic Studies (IISS), Matthew Kroenig of Georgetown University and the Council on Foreign Relations, and Matthew Fuhrmann of Texas A&M University. They contend

that nuclear weapons proliferation is more likely to occur with the spread of civilian nuclear technology and that such nuclear proliferation constitutes a threat to international security – certainly if there is nuclear weapons use, but even if there is not.

The volume's second section, "Nuclear Power, Nuclear Weapons – Clarifying the Links," makes the case that civilian nuclear power programs actually afford a major leg up for any nation seeking development of a nuclear weapons option. It showcases four studies. The first, by former U.S. Nuclear Regulatory Commissioner and RAND Science Division director Victor Gilinsky, explains just how useful and quickly transformable power-reactor plutonium is to making a proliferator's first nuclear weapons. His analysis includes plutonium generated in the most proliferation resistant of power plants, the light water reactor. Susan Voss, formerly with Los Alamos National Laboratory, adds to this argument by detailing just how much intangible nuclear weapons material production-related technology and training is imparted along with any "peaceful" nuclear power program. Taken together, these studies more than suggest that nuclear power programs present nuclear weapons proliferation risks for any state but those we are certain to have forsworn making nuclear weapons and their key ingredients – highly enriched uranium and separated plutonium.

Optimism that we can easily persuade states to forswear making these nuclear fuels because of the cost and complexity doing so, moreover, is misplaced. Here, Richard Cleary of the American Enterprise Institute's account of previous American failures to get Iran, Brazil, South Korea, and Pakistan to stop making enriched uranium or separated plutonium is a cautionary tale. Compounding this sad historical record are the technical facts that nuclear fuel-making is not

as complex or daunting as generally portrayed. Victor Gilinsky makes this point in regard to quick and dirty plutonium reprocessing schemes, at least one that is available in the unclassified literature. As for uranium enrichment, Scott Kemp of MIT's nuclear engineering department documents how basic centrifuge uranium enrichment technology is good enough to make bombs and is actually a relatively easy and affordable hurdle for states to climb over. Worse, it is an activity that can be hidden relatively easily from IAEA inspections until a state chooses to break out quickly to acquire nuclear weapons.

This, then, brings us to the book's third section, "How Well Can We Safeguard the Peaceful Atom?" and the question of how well the IAEA and the United Nations (UN) are likely to do their job enforcing the NPT in the future. The short answer is mixed. The key concern here is how well these institutions will be able to cope with the likely spread of nuclear energy programs to new states. In his analysis, Patrick S. Roberts of Virginia Tech raises a number of worrisome questions. What are the risks associated with simply scaling up the IAEA's current inspection system even assuming it had the funds to do so? Would it tolerate the inevitable increase in false alarms that must come with more inspections or would it tune the system to filter out such alarms even further than it already has? What, moreover, should be the metrics for IAEA success or failure in conducting its inspections? Would we know when and if the IAEA was failing at its mission and be able to take timely corrective action?

We get worrisome, partial answers from the analyses of two of the IAEA's best known deputy directors general for safeguards, Olli Heinonen and Pierre Goldschmidt. Dr. Heinonen notes that the IAEA could

have the authority to conduct more special short-notice inspections and that it could do so without necessarily securing the unanimous consent of the agency's governing board. He argues that it would be most useful in the future for the IAEA's safeguards department to exercise such authority. It remains to be seen if it ever will.

Will there be clear consequences for those that violate the nuclear rules? Pierre Goldschmidt homes in on this question and recommends that the enforcement of safeguard agreements be made mandatory for any IAEA member and that they remain in force whether or not the country in question remains a member of the NPT. He also recommends that a set of country-neutral sanctions be agreed to by the UN Security Council in advance so that any country the IAEA finds in breach of its IAEA or NPT obligations will be certain to be sanctioned. The prospects for these recommendations' adoption are doubtful to unclear.

Until and unless they are adopted, whatever enforcement there might be will be taken by the major states relying on their own intelligence. But how much should we rely on such actions? This issue is examined in the book's fourth section, "Ignoring Nuclear Weapons Proliferation Intelligence."

Conventional wisdom presumes governments want to collect all the intelligence they can on proliferating states and that they are eager to act on this intelligence, especially if the proliferators are violating the rules. All that is lacking, according to this view, is sufficient, timely intelligence. With more situational awareness, it is argued, the United States and like-minded states can do much more to combat nuclear proliferation.

This supply side view of countering proliferation, however, ignores significant demand problems Washington and other states have for such timely proliferation information. Certainly, the United States sat on intelligence regarding A. Q. Khan in Pakistan and acted only very belatedly regarding intelligence concerning North Korea's uranium enrichment program. Such reticence, moreover, is hardly new.

Consider the case of Israel's acquisition of U.S. nuclear weapons material in the 1960s. Israel promised Presidents John Kennedy, Lyndon Johnson, and Richard Nixon that it would not acquire nuclear weapons. When intelligence emerged that Israel had illicitly acquired U.S. weapons-grade uranium and developed nuclear arms, Nixon and, to a lesser extent, Johnson glossed over or excused it. This sad history is detailed in Victor Gilinsky's history and backgrounder to the now famous meeting between Nixon and Golda Meir in 1969.

In yet another chapter, Leonard Weiss, formerly chief of staff of the Senate Governmental Affairs Committee, which had oversight of nuclear proliferation matters, details how the U.S. Government did all it could to deny the possibility that the Israelis, who ratified the Limited Test Ban Treaty, conducted a nuclear test off the coast of South Africa in 1979, even though the evidence clearly suggests they did.

Israel, however, was not the only country to receive such treatment. In his historical analysis, Robert Zarate of the Foreign Policy Initiative details how American policymakers either ignored or distorted proliferation intelligence on Iran's and North Korea's nuclear programs in order to avoid taking timely action against either state.

Finally, there is the problem with how we interpret the intelligence we get. Today, most officials would like to believe that there is still time to prevent Iran from developing nuclear weapons. This has encouraged the view that Iran is still far from getting its first bomb. Gregory Jones, Nonproliferation Policy Education Center's (NPEC) senior researcher, though, details how, in fact, Iran's nuclear weapons capability is so advanced that it no longer is a problem to be solved so much as a fact with which to be reckoned. That many intelligence officials cannot bring themselves to agree to this in public suggests how uncertain relying on their intelligence findings would be to assure timely counterproliferation actions to manage nuclear weapons proliferation.

How, then, are we to prevent more Irans? Mr. Jones suggests that we tighten the nuclear rules. This, then, brings us to the most important part of this volume's offerings: the nonproliferation principles and steps recommended in "Serious Rules for Nuclear Power without Proliferation." Victor Gilinsky and I developed this chapter initially as a thought exercise. What would a proper set of nonproliferation rules look like if one did not put nuclear power sales and promotion first, but instead emphasized security?

As we see it, this question has only been seriously tackled twice before: in 1946 with the Acheson-Lilienthal Report on the international control of nuclear power, and in 1976 with the Ford-Carter executive branch decisions to defer the use and production of commercial plutonium-based nuclear fuels. The Acheson-Lilienthal proposals were rejected by the Soviets. Shortly thereafter, the Dwight Eisenhower administration decided to share U.S. civilian nuclear energy internationally in the hopes that the control

issues raised in the Acheson-Lilienthal Report could be solved later. This gave rise to the Atoms for Peace program, the creation of a loose set of nuclear controls administered by the IAEA, and the wholesale export of nuclear technology internationally. Atoms for Peace remained U.S. policy until 1974, when this approach was literally blown away by India's "peaceful" nuclear explosion of a bomb made of plutonium that was produced using "peaceful" U.S. and Canadian civilian nuclear assistance. Shortly thereafter, the London Suppliers Group secretly agreed to restrict the export of nuclear fuel-making technologies to nonweapons states, and Presidents Gerald Ford and Jimmy Carter announced U.S. efforts to defer the commercial use of plutonium-based fuels both domestically and abroad.

That was over 40 years ago. Now, after Iraq, Iran, North Korea, Libya, A. Q. Khan, and Syria, there is cause to review the bidding once again. Certainly, the experience of the last 3 and a half decades has challenged the assumptions that drove the nuclear policies of Presidents Ford and Carter. These policies presumed that we could detect nuclear fuel-making. Uranium enrichment centrifuges, which are relatively easy to hide, were not yet readily available then, nor had much thought been given to just how small one could make a dedicated, covert reprocessing plant. It also was presumed that if illicit nuclear activities were detected, swift, effective international enforcement would follow. Our experience with Iran and North Korea, though, has jilted many of these notions. In fact, the United States and others now find it challenging just to maintain existing nuclear nonproliferation controls, much less to tighten them.

Much of this nonproliferation defensiveness is reflected in how the United States and others view the

NPT. This view is encapsulated in a diplomatic formulation known as “the three-pillars of the NPT.” According to this view, the NPT and the nuclear non-proliferation regime rest on three objectives that must be balanced against one another. The first is nonproliferation (as manifested by Articles I, II, and III of the NPT). This roughly translates into IAEA safeguards and UN Security Council enforcement measures against NPT violators. The second is nuclear disarmament (as manifested by Article VI of the NPT). It focuses on reducing the NPT nuclear weapons states’ atomic arsenals (almost exclusively the United States and Russia). The third is sharing “peaceful” nuclear technology (as manifested by Article IV of the NPT). This can range, depending on who is defining “peaceful,” from the sharing of benign medical isotopes to transferring proliferation-prone nuclear fuel-making technologies.

Putting aside how little of the NPT’s diplomatic history actually supports this popular diplomatic interpretation,<sup>3</sup> the key problem with this three-pillar formulation is how intellectually self-defeating it is. First, if the nuclear-armed states are judged not to have sufficiently disarmed their nuclear stockpiles, why or how should this be used as the pretext for promoting **less** nonproliferation? Would not backing off necessary nonproliferation controls only increase the prospects for more proliferation and, therefore, increase demands for **more** nuclear armament?

Similarly, how is supplying nonweapons states with ever more “peaceful” nuclear technology a prerequisite for securing more or tighter nonproliferation controls? If the technology in question is truly peaceful and benign, by definition, it ought to be safe to share without any apprehensions that it might be diverted

easily in order to make bombs. Also, if it could not be used to make bombs, nuclear supplier states would hardly need a nonproliferation incentive to share it. If, on the other hand, a specific civilian nuclear technology was particularly proliferation-prone and therefore not clearly safe to share, why would any state wanting to promote nonproliferation believe it was under an NPT obligation to transfer it?

Again, does not the promotion of nonproliferation presume the sharing of only truly “peaceful” nuclear goods and technology and the general encouragement of nuclear restraint? Why would any state want to bargain away achieving the goal of nonproliferation with its presumed benefits? How much sense does any of this make? The short answer is: not much. At the very least, sounder thought ought to drive our nonproliferation policies.

To pursue any sound undertaking to promote nuclear power without proliferation, Victor and I suggest five guiding principles:

1. **Locking down the NPT.** It is not consistent with the NPT’s purpose for members to exercise the withdrawal provision after gaining technology of relevance to weapons – whether by importing it or developing it domestically – as this was done under the assumption by other members that it was for peaceful uses. Treaty members cannot exercise the withdrawal clause without squaring accounts. As a practical matter, this would mean membership in the Treaty was essentially permanent. Under this interpretation, North Korea’s 2003 announcement of “withdrawal” while in noncompliance of IAEA inspection requirements left that country in a state of Treaty violation.

2. **Assuring a technological margin of safety.** The Treaty cannot be a vehicle for a state to legally come

overly close to a weapons capability. There has to be a technological safety margin between genuinely peaceful and potentially military applications. As a consequence, the “inalienable right” language in the Treaty has to be interpreted in terms of the Treaty’s overriding objective, and thus there have to be restrictions on the kinds of technology that are acceptable for nonmilitary use. Nuclear power needs to develop in a way that does not provide easy access to nuclear explosives. Where to draw the line is now coming to a head in the context of Iran’s nuclear program.

**3. Adjusting nuclear sovereignty for greater security.** Countries involved with nuclear energy must accept that the inherent international security dangers such involvement implies require them to relinquish a considerable degree of sovereignty to international security organizations, in particular the IAEA inspectorate. In view of the concerns about clandestine facilities, both with respect to enrichment and reprocessing, countries have to agree to essentially unlimited inspection rights for international inspectors if the circumstances warrant. The Additional Protocol is a good start toward expanding inspectors’ rights, but this unfortunately goes along with a reduction in the frequency of normal inspections.

**4. Getting serious about enforcement.** The NPT needs an established enforcement mechanism to deal with Treaty violations in a predictable way. The foregoing rules for operating nuclear power plants in a manner that is consistent with international security are not self-enforcing. There has to be agreement among the Treaty parties concerning reasonably predictable responses to particular violations, and most particularly any effort by a state to withdraw from the Treaty, so as to remove the notion that violators can escape with impunity.

**5. Applying nuclear limitations and reductions to all nuclear weapons states.** All nuclear weapons states have to participate in weapons reductions. This is essential for gaining the cooperation of the other NPT members in restrictive measures. In the first instance, this includes Britain, France, and China, which up to now have not participated in the reduction process that has involved the United States and Russia. But it also has to include India, Israel, Pakistan, and North Korea. With 190 nations adhering to the NPT, its obligations should be regarded as universal, thus applying to all countries whether or not they formally joined the Treaty. From this point of view, North Korea and the three countries that never joined would be regarded as members who are out of compliance. But by participating in a suitably monitored weapons reduction process, they could be viewed as members in the process of coming into compliance.

Of course, pushing these principles in policy is sure to create considerable friction. Some have argued that it simply is impractical to push such policies. In the end, this sadly may be the case. But if so, it suggests the urgency of curbing our own enthusiasm and that of other nuclear supplier states for the international spread of nuclear energy programs where they currently do not exist. At the very least, until governments have tougher nonproliferation controls in place, they ought not be spending more to promote the export of this technology.

## **ENDNOTES - CHAPTER 1**

1. See, e.g., Steven Kidd, "Nuclear Proliferation Risk—Is It Vastly Overrated?" *Nuclear Engineering International*, July 23, 2010, available from [www.neimagazine.com/story.asp?storyCode=2056931](http://www.neimagazine.com/story.asp?storyCode=2056931).

2. See, e.g., Richard Lester, "New Nukes," *Issues in Science and Technology*, Summer 2006, available from [www.issues.org/22.4/lester.html](http://www.issues.org/22.4/lester.html); Jungmin Kang, Frank von Hippel, "Limited Proliferation-Resistance Benefits from Recycling Unseparated Transuranics and Lanthanides from Light-Water Reactor Spent Fuel," *Science and Global Security*, No. 3, 2005, pp. 169-181; James M. Aton, "The Myth of Proliferation-Resistant Technology," *The Bulletin of Atomic Scientists*, November/December 2009, available from [cybercemetery.unt.edu/archive/brc/20120621022618/http://brc.gov/sites/default/files/meetings/presentations/james\\_m\\_acton-the\\_myth\\_of\\_proliferation-resistant\\_technology.pdf](http://cybercemetery.unt.edu/archive/brc/20120621022618/http://brc.gov/sites/default/files/meetings/presentations/james_m_acton-the_myth_of_proliferation-resistant_technology.pdf); Jerry Taylor, "Nuclear Energy: Risky Business," *Reason*, October 22, 2008, available from [www.cato.org/publications/commentary/nuclear-energy-risky-business](http://www.cato.org/publications/commentary/nuclear-energy-risky-business); "Nuclear Power: Fracked Off," *The Economist*, June 1, 2013, available from [www.economist.com/news/united-states/21578690-thanks-cheap-natural-gas-americas-nuclear-renaissance-hold-fracked](http://www.economist.com/news/united-states/21578690-thanks-cheap-natural-gas-americas-nuclear-renaissance-hold-fracked); and Mycle Schneider and Anthony Froggett, *The World Nuclear Industry Status Report 2013*, Paris, France/London, UK: July 11, 2013, available from [www.worldnuclearreport.org/IMG/pdf/20130716msc-worldnuclearreport2013-lrv4.pdf](http://www.worldnuclearreport.org/IMG/pdf/20130716msc-worldnuclearreport2013-lrv4.pdf).

3. On reading the NPT, see Albert Wohlstetter, "Spreading the Bomb without Quite Breaking the Rules," *Foreign Policy*, No. 25, Winter 1976-77, pp. 88-96, 145-179; Arthur Steiner, "Article IV and the 'Straightforward Bargain,'" PAN Heuristics Paper 78-832-08, in Albert Wohlstetter *et al.*, *Towards a New Consensus on Nuclear Technology*, Vol. II, Supporting Papers, ACDA Report No. PH-78-04-832-33, Marina del Rey, CA: PAN Heuristics, 1978, pp. 1-8; Eldon V.C. Greenberg, *The NPT and Plutonium: Application of NPT Prohibitions to "Civilian" Nuclear Equipment, Technology and Materials Associated with Reprocessing and Plutonium Use*, Washington, DC: The Nuclear Control Institute, 1993, available from [www.npolicy.org/article.php?aid=292](http://www.npolicy.org/article.php?aid=292); Henry Sokolski, "The Nuclear Nonproliferation Treaty and Peaceful Nuclear Energy," Testimony before "Assessing 'Rights' under the Nuclear Nonproliferation Treaty," a hearing of the U.S. House of Representatives, Committee on International Relations, Subcommittee on International Terrorism and Nonproliferation, March 2, 2006, available from [www.npolicy.org/article.php?aid=392&rtid=8](http://www.npolicy.org/article.php?aid=392&rtid=8); Robert Zarate, "The Three Qualifications of Article IV's 'Inalienable Right,'" and Christopher Ford, "Nuclear Technology Rights and Wrongs: The

NPT, Article IV, and Nonproliferation," in Henry Sokolski, ed., *Reviewing the NPT*, Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2010, pp. 219-384, available from [www.npolicy.org/thebook.php?bid=2](http://www.npolicy.org/thebook.php?bid=2).