

STIMSON

The New Nuclear Agenda:
Prospects for US-Japan Cooperation

Edited by Yuki Tatsumi

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Stimson Center
1111 19th Street, NW, 12th Floor
Washington, DC 20036
Telephone: 202.223.5956
Fax: 202.238.9604
www.stimson.org

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Forward

I am pleased to present *The New Nuclear Agenda: Prospects for US-Japan Cooperation*, edited by Yuki Tatsumi, Stimson Senior Associate. This volume explores the complex and multi-faceted nuclear agenda, considering the range of security issues from nuclear energy and technology to proliferation, and considers how it could become a promising new priority for US-Japan cooperation.

The accident at the Fukushima Dai-ichi Nuclear Power Station demonstrated quite dramatically the national security risk that civil nuclear power stations can present, and has led to reflections in many countries around the world about the long-term prospects for investments in nuclear energy, and weighing the environmental, economic, and safety factors alongside the energy benefits.

The United States and Japan share a goal of eliminating the security challenges posed by the proliferation and/or mismanagement of nuclear materials. They bring complementary insights and perspectives: the United States, as one of the five nuclear weapon states under the Nuclear Nonproliferation Treaty (NPT) regime, leads various multinational efforts to prevent nuclear weapons, materials, and related technologies from falling into hostile hands. Japan, as the only country in the world that has been subjected to a nuclear weapons attack, represents the interests of advanced industrialized countries with robust civil nuclear energy programs that have renounced the possession of nuclear weapons.

This volume and its contributing authors from Japan and the United States see prospects for enhanced cooperation between Tokyo and Washington. The authors also believe that by pursuing nuclear issues with a more integrated approach, the United States and Japan will help shape the global nuclear future, and the difficult choices about nuclear energy, technology, and counter-proliferation efforts that many countries will have to address.

It is my hope that this volume will encourage discussion among the various stakeholders in the nuclear industry, in military and civilian policy circles, and among concerned citizens in the United States and Japan on how to build a safer and more secure future.

Ellen Laipson
President and CEO
The Stimson Center

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Yuki Tatsumi
Senior Associate
East Asia Program

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Acronyms

A2/AD	Anti-access and Area Denial
ABM	Anti-ballistic Missile
AFCI	Advanced Fuel Cycle Initiative
ASBM	Anti-ship Ballistic Missile
ASTOP	Asia Senior-level Talks on Nonproliferation
ASEAN	Association of Southeast Asian Nations
BMD	Ballistic Missile Defense
BRIC	Brazil, Russia, India, and China
BTRP	Biological Threat Reduction Program
BWR	Boiling Water Reactor
CBW	Chemical and Biological Weapon
CD	Conference on Disarmament
COPs	Conference of the Parties (to the UN Framework Convention on Climate Change)
CSI	Container Security Initiative
CTBT	Comprehensive Test Ban Treaty
CTR	Cooperative Threat Reduction
DOD	Department of Defense (United States)
DOE	Department of Energy (United States)
DOS	Department of State (United States)
DPJ	Democratic Party of Japan
DPRK	Democratic People's Republic of Korea (North Korea)
FMCT	Fissile Material Cutoff Treaty
G8GP	Global Partnership Against the Spread of Weapons and Materials of Mass Destruction

GIF	Generation IV International Forum
GNEP	Global Nuclear Energy Partnership
GOJ	Government of Japan
GPALS	Global Protection Against Limited Strikes
HLW	High Level Waste
IFNEC	International Framework for Nuclear Energy Cooperation
IHI	Ishikawajima-Harima Heavy Industries
ITER	International Thermonuclear Experimental Reactor
JAEA	Japan Atomic Energy Association
JAEC	Japan Atomic Energy Commission
JAERI	Japan Atomic Energy Research Institute
JICA	Japan International Cooperation Agency
JINED	Japan International Nuclear Energy Development
JNC	Japan Nuclear Cycle Development Institute
JNFL	Japan Nuclear Fuel Limited
JNES	Japan Nuclear Energy Safety Organization
(J)SDF	(Japan) Self-Defense Forces
MEXT	Ministry of Culture, Education, Sports, Science and Technology (Japan)
METI	Ministry of Economy, Trade, and Industry (Japan)
MNES	Mitsubishi Nuclear Energy Systems
MOD	Ministry of Defense (Japan)
MOFA	Ministry of Foreign Affairs (Japan)
MTCR	Missile Technology Control Regime
NATO	North Atlantic Treaty Organization
NDPG	National Defense Program Guidelines (Japan)
New START	New Strategic Arms Reduction Treaty
NFU	No First Use
NGO	Non-governmental Organization

NISA	Nuclear and Industrial Safety Agency (Japan)
NMD	National Missile Defense
NNSA	National Nuclear Security Administration (United States)
NPG	Nuclear Planning Group
NPDI	Nonproliferation and Disarmament Initiative
NPP	Nuclear Power Plant
NPR	Nuclear Posture Review
NPT	Nuclear Nonproliferation Treaty
NRC	Nuclear Regulatory Commission (United States)
NREA	National Resources Energy Agency (Japan)
NSC	Nuclear Safety Commission (Japan)
NSG	Nuclear Supplies Group
NSS	National Security Strategy
NWPA	Nuclear Waste Policy Act
NWFZ	Nuclear Weapon Free Zone
NWSS	Nuclear Weapon Storage Security Program
ODA	Official Development Assistance
PCAST	President's Council of Advisors on Science and Technology
PGS	Prompt Global Strike
PSI	Proliferation Security Initiative
PWR	Pressurized Water Reactor
R&D	Research and Development
SCC	Security Consultative Committee
SCM	Supply Chain Management
SDI	Strategic Defense Initiative
SOAE	Strategic Offensive Arms Elimination Program
SORT	Strategic Offensive Reduction Treaty
STA	Science and Technology Agency (Japan, merged with Ministry of Education in 2001 to become MEXT)

START II	Second Strategic Arms Reduction Treaty
TLAM/N	Nuclear-equipped Sea-launched Cruise Missile
TMD	Theater Missile Defense
TNW	Tactical Nuclear Weapon
UNGA	United Nations General Assembly
UNSC	United Nations Security Council
UNSCR	United Nations Security Council Resolution
US	United States
USAID	United States Agency for International Development
WMD	Weapons of Mass Destruction
WMD-PPI	Weapons of Mass Destruction-Proliferation Prevention Initiative

Introduction

Yuki Tatsumi

If the atomic bomb were merely another, though more devastating, military weapon to be assimilated into our pattern of international relations, it would be one thing. We would then follow the old custom of secrecy and nationalistic military superiority relying on international caution to prescribe the future use of the weapon as we did with gas. But I think the bomb instead constitutes merely a first step in a new control by man over the forces of nature too revolutionary and dangerous to fit into old concepts.

Henry L. Stimson, Secretary of War, September 11, 1945¹

Today, nuclear security challenges have grown increasingly multi-dimensional and complex. This is a direct result of globalization, population growth, global warming, rising energy demands, regional competition, and a host of other, seemingly unrelated trends. Addressing the formidable new challenges presented by the greater availability of nuclear weapons and related technologies, as well as increased proliferation and vertically expanding arsenals among certain nuclear weapons states, necessitates a more nuanced toolkit that draws upon a wider and more coordinated breadth of policy instruments. This initiative, *Bridging Nuclear Ideals with Reality*, was launched based upon the observation that existing national strategies fail to manage the full range of nuclear issues in an integrated way.

The United States and Japan share a complex history with regard to nuclear weapons, as well as a mutual understanding of the civilian use of nuclear power. When the United States dropped two atomic bombs on Hiroshima and Nagasaki in August 1945, thus ending the Second World War, few would have reasoned that it would help create a bilateral alliance by 1951—an alliance that would prove pivotal in the context of the strategic competition between the United States and the Soviet Union. Since then, US extended nuclear deterrence (the so-called “nuclear umbrella”) has been an integral part of the US-Japan security alliance. It is the authors’ belief that the common concerns of Washington and Tokyo not only provide unique opportunities to work together, but also that by pursuing a balanced and comprehensive approach that utilizes all of their national resources, the United States and Japan ultimately can help shape our global nuclear future. In doing so, it is imperative that Washington and Tokyo closely coordinate the various dimensions of their nuclear policy, both internally and bilaterally. The collection of essays in this volume is a first step toward reevaluating the nuclear enterprise in both countries, and proposes novel approaches to bridging the gap between ideal outcomes and the complicated realities that plague us: proliferation, deterrence, and energy insecurity.

Managing nuclear issues was simple and straightforward during the Cold War, in contrast to today’s threat portfolio. With the possession of nuclear weapons and their technologies limited to the five declared nuclear states (the United States, Soviet Union, England, France,

1 Henry L. Stimson. *Letter to President Harry S. Truman*. September 11, 1945. <http://www.spartacus.schoolnet.co.uk/2WWatom.htm> (Accessed December 4, 2011).

and China), it was relatively easy to make the distinction between nuclear weapon “haves” and “have nots.” By the same token, the number of countries that could afford civilian nuclear power as a source of energy was also limited. Limited access to technology and the financial wherewithal to ensure the safe and effective operation of a nuclear reactor greatly restricted commercial nuclear ownership. As such, the existing global nonproliferation regime—defined by the Nuclear Nonproliferation Treaty (NPT)—was established on the premise that nuclear-related technologies and materials would be controlled by a small number of countries, while the declared states would also work toward eliminating their nuclear capability.

The basic assumptions of the NPT-defined global nuclear nonproliferation regime began to be questioned after the Cold War. On the one hand, the Cold War provided incentive for the declared nuclear weapon states (particularly the United States and Soviet Union) to reduce their own nuclear weapons. But at the same time, the world grappled with the challenge of preventing those involved in the post-Soviet states’ nuclear weapons complex from selling their weapons, technologies, and expertise to states and other entities amidst a rapidly degenerating security and economic environment. Next, advances in science and technology—including the invention of the Internet, expedited transportation technologies, the democratization of dual-use technologies around the globe, and instant communications—began to make the transfer and sharing of information around the globe much easier. In the words of one observer, the world became “flat.”²

This flattening helped eliminate the barriers of national borders. Its positive effects made goods and knowledge much more accessible to a wider population, yielding unprecedented advances for the worldwide economy and to global economic development. On the other hand, it has intensified the risk of goods, technology, and knowledge being abused by nation-states and non-state actors (including individuals) with questionable intentions. In the context of nuclear power, globalization has heightened the risk of nuclear-related information, materials, and technologies made accessible to nation-states and hostile non-state actors alike. Furthermore, the growing recognition of nuclear power as a viable and affordable source of energy has led to a greater number of countries seeking civilian nuclear power plants. All of these developments have resulted in an increased number of stakeholders in the nuclear sphere, which has made the nuclear issue more multi-faceted and complicated for the world to address.

For example, nuclear proliferation in South Asia—symbolized by the emergence of India and Pakistan as bona fide nuclear powers after the tests in 1998—was the first indicator of a greater number of countries trying to realize their nuclear aspirations. Nuclear programs in North Korea and Iran have further aggravated concerns. In short, these events pose serious questions as to whether the global nuclear nonproliferation regime—established based on the assumption that only a small number of countries have access to nuclear weapons and related technologies—can effectively address nuclear challenges today.

2 Thomas L. Friedman. *The World Is Flat: A Brief History of Twenty-first Century* (Sarrar, Straus and Giroux, 2005)..

Over the years, the United States and Japan have closely cooperated on nuclear disarmament and nonproliferation not only through regular bilateral consultations but also in many of the multinational initiatives led by the United States. As the unpredictability of North Korea intensifies and the Chinese military buildup continues, Japan most likely will continue to rely on US-extended nuclear deterrence. It will also work with the United States to improve conventional military capabilities, as well as the operational relationship between the US military and Japan Self-Defense Forces (JSDF).³

With regard to civil nuclear power, the Great Eastern Japan Earthquake on March 11, 2011, and the nuclear accidents at Fukushima Dai-ichi Nuclear Power Station brought public attention to the issue of nuclear safety. These events reminded us that, regardless of the cause, an accident at a nuclear power plant could create a national crisis, with its after-effects lingering long after the initial accident. Given its devastating impact, a nuclear accident, whether it is caused by a natural disaster (like Fukushima), human error, or hostile action, is a homeland security concern. Finally, as more countries—especially emerging economies—move to pursue nuclear power as an alternative source of energy, there is a greater need to ensure that the proliferation of civilian nuclear power and its related technologies does not lead to the proliferation of nuclear weapon programs. In other words, the civil nuclear energy sector, which used to be relatively insulated from national security policy (particularly in Japan), is increasingly becoming a part of the security policy discussion in both the United States and Japan.

Over the years, the United States and Japan have developed a long list of stakeholders in nuclear policy that reaches far beyond traditional national security agencies. Among these diversified stakeholders, four policy “villages” have emerged on nuclear issues.

3 The two governments have launched a bilateral dialogue on extended deterrence, which is now held twice a year.

Four Policy “Villages” on Nuclear Issues

Policy village	Primary policy goal	Main US stakeholders	Main Japanese stakeholders ⁴
Nuclear Disarmament/ Nonproliferation	Ultimate elimination of nuclear weapons; prevention of nuclear proliferation to undesirable parties	National Security Council (NSC); Department of Defense (DOD); Department of State (DOS); Department of Energy (DOE)/ NSAA ⁵	Ministry of Foreign Affairs (MOFA); Ministry of Economy, Trade and Industry (METI); Ministry of Defense (MOD)
National Security	Maintenance of effective and credible US (nuclear) extended deterrence	NSC DOS DOD DOE/NSAA	MOFA MOD
Civil Nuclear Energy	Manage civil nuclear energy cooperation	DOE/NSAA NRC	METI/Nuclear Industry Safety Agency (NISA); ⁶ Natural Resources Energy Agency (NREA); ⁷ Ministry of Culture, Education, Sports, Science and Technology (MEXT); Atomic Energy Commission of Japan (JAEC)
International Development Assistance	Manage economic assistance and capacity-building assistance to empower developing countries	DOS USAID	MOFA JICA

4 In Japan, in addition to the above stakeholders, the Minister for the Restoration from and Prevention of Nuclear Accident and the Minister of State for the Corporation in support of Compensation for Nuclear Damage—the position created in the aftermath of the Fukushima Dai-ichi accident—entered the nuclear policy arena as new players.

5 NSAA is a quasi-autonomous agency within DOE.

6 Prior to the accident at Fukushima Dai-ichi, NISA was housed within METI.

7 NREA is housed within METI.

Among these four policy “villages,” members of the international development assistance policy village have the potential to emerge as the new and critical stakeholders in nuclear policy. As a greater number of countries, particularly those in the developing world, pursue the acquisition of a civil nuclear power industry as a tool for economic development, the entities that manage official development assistance (ODA), such as the US Agency for International Development (USAID) and the Japan International Cooperation Agency (JICA), are becoming the facilitators in transferring the relevant technologies, as well as ensuring that the recipient of such technology will have sufficient capacity to prevent its illegitimate transfer. This has pitted nonproliferation advocates who seek to control the spread of sensitive nuclear, biological, chemical, and missile technologies against the economic development community that views the spread of innovative capacities, including high technology goods and services, as critical to success in the new global economy. USAID and JICA, who are engaged in various aspects of capacity-building in the developing world, as well as international development non-governmental organizations (NGOs) are active participants in the discourse within this fourth policy village.

To date, these villages have largely operated in isolation. Each has its own priorities that it would pursue with little consideration for the potential impact on the others. This compartmentalized approach was never optimal, but sufficed at a time when nuclear issues were sublimated under the overriding security concerns of the Cold War. However, it has become increasingly problematic in recent years. Progress in science and technology (particularly information technology), information about nuclear weapons, nuclear energy, and related technology has become more accessible to a wider number of people via the Internet. This has raised the risk of non-state actors considerably—such as international terrorist organizations—abusing publicly available knowledge on nuclear technology, as well as accessing physical technologies, to threaten global security. Increased affordability of nuclear technology also has increased the risk of developing countries acquiring it before they establish effective measures to prevent illegitimate transfers of such technologies. Moreover, as nuclear disarmament discussions are pushed into mainstream dialogue, greater complications have arisen regarding the US deterrent and extended deterrent postures. In short, the time is ripe for the United States and Japan to overcome the traditional compartmentalized approach to nuclear issues.

Each chapter in this volume addresses the various dimensions of nuclear issues and is closely linked to one of the four policy villages described above.⁸ In chapter one, Brian Finlay and Yuki Tatsumi provide the conceptual framework and context for this volume. The chapter traces the evolution of global nuclear challenges, with a particular focus on the United States and Japan. After introducing the ongoing cooperative efforts between Washington and Tokyo, the chapter concludes by proposing that the two governments should rethink their own policy toolkits to better adjust to the diversified nature of nuclear challenges in today’s international environment.

Chapter two, by Taku Ishikawa, addresses the challenges for the US-Japan alliance in ensuring effective deterrence in the “Age of Nuclear Disarmament.” Ishikawa argues that the

⁸ Since the fourth policy village—international development assistance—is such a recent phenomenon, chapter one identifies the international development assistance policy village as a newly emerging stakeholder in nuclear issues, rather than it having an independent chapter.

United States and Japan both have to keep the long-term policy goal of nuclear disarmament visible in order to uphold the already fragile global nuclear nonproliferation regime. As they muddle through that effort, Ishikawa suggests that the United States and Japan should discuss how the two countries can work closely together to eventually create “regional deterrence” based on the regional security architecture in Northeast Asia. Ishikawa insists that it is particularly important that Japan contributes its fair share to “regional deterrence” as conceptualized by the United States in order to retain the credibility of the US-Japan alliance.

Chapter three, by Jane Nakano, explores the challenges and opportunities in US-Japan cooperation in the arena of civil nuclear energy. Nakano suggests that US-Japan cooperation in civil nuclear energy has benefited both countries. Japan, as a key US ally in the Asia-Pacific region, was able to develop its indigenous civil nuclear energy industry to the point that it now possesses a range of fuel cycle technologies. The United States benefited from close cooperation in research and development (R&D) with Japan, augmenting its own nuclear power industry. She cautions that Japan’s potential reduction of its reliance on nuclear energy could have an impact beyond the area of US-Japan bilateral civil nuclear energy cooperation.

Chapter four, by Heigo Sato, discusses the developments in US-Japan cooperation in nuclear nonproliferation. In his chapter, Sato argues that having multiple nonproliferation initiatives (e.g. Nuclear Nonproliferation Treaty, International Atomic Energy Agency, and Nuclear Suppliers Group) with different sets of rules resulted in gaps and loopholes in the supply chain of nuclear related technologies and materials. He argues that the United States and Japan, both claiming to be strong advocates of nuclear nonproliferation, should cooperate to supplement the ongoing multinational initiatives to address the existing gaps and loopholes that undermine these initiatives.

The volume finishes with the concluding chapter, titled “Way Forward,” which highlights the challenges for improved policy coordination both within and between the United States and Japan in nuclear policy based on the preceding four chapters. In addition, it explores the potential impact that the nuclear accidents at the Fukushima Dai-ichi Nuclear Power Station may have on the discourse of nuclear policy, and suggests that the Fukushima accident can serve as an opportunity for future cooperation in nuclear policy.

Working together, the United States and Japan have a lot to offer in addressing nuclear issues around the world today. In order to capitalize on and maximize their assets—diplomatic and otherwise—the United States and Japan each needs a nuclear policy that is closely coordinated, based on a shared vision, and which galvanizes all the stakeholders of nuclear issues in both countries. So far, however, their compartmentalized approach to nuclear issues has made such close coordination difficult. It is our strong hope that this volume will motivate the various stakeholders of nuclear issues in the United States and Japan to begin the discussion on how they can all work together toward realizing their shared objectives.

Chapter One

Reforming the Policy Toolkit: Toward a Coherent US-Japan Strategy in Nuclear Policy

Brian Finlay and Yuki Tatsumi

As the only nuclear power to have used a nuclear weapon, the United States has a moral responsibility to act. We cannot succeed in this endeavor alone, but we can lead it, we can start it... So today, I state clearly and with conviction America's commitment to seek the peace and security of a world without nuclear weapons.

President Barack Obama, Hradčany Square, Prague, Czech Republic, April 2009¹

I believe that invention of the nuclear weapon and subsequent threat to the survival of the human race being man's doing, the solution to the problem must be within the reach of man's effort.

Naoto Kan, former Prime Minister of Japan, UN General Assembly, 24 September 2010²

During the Cold War, the nature of the nuclear threat was relatively straightforward. The primary security challenge facing the international community was to avoid a cataclysmic exchange between the United States and the Soviet Union. Because a relatively small number of nation-states possessed the means to produce nuclear weapons, controlling proliferation to a wider array of actors—both state and non-state—was relatively uncomplicated. The nuclear-armed states jealously guarded their secrets. Technologies were predominantly “single purpose” and locked under strict government command and control procedures. Policy conflicts were minimal and largely pitted the security interests of the state against the opinions of a relatively small group of poorly funded anti-nuclear advocates. Industry's role within the sector was limited to a small number of companies whose activities were closely scrutinized, regulated, or controlled by their host governments.

Under the 1968 Nuclear Nonproliferation Treaty, the five declared nuclear powers—the United States, the Soviet Union (Russia), Great Britain, France, and China—agreed to pursue disarmament in exchange for a pledge by all other signatories to forswear the bomb. Progress toward this goal, however, was frustratingly slow for many of the non-nuclear weapon states, which led to international policy divisions as well as pushback against global

1 The White House. *Remarks by President Barack Obama*. Prague, Czech Republic. April 5, 2009. <http://www.whitehouse.gov/the-press-office/remarks-president-barack-obama-prague-delivered>. (Accessed July 22, 2011).

2 Prime Minister of Japan and His Cabinet. *Address by H.E. Mr. Naoto Kan, Prime Minister of Japan At the Sixty-Fifth Session of the United Nations General Assembly*. New York (September 24, 2010). http://www.kantei.go.jp/foreign/kan/statement/201009/24speech_e.html. (Accessed July 25, 2011).

nonproliferation efforts. For these non-nuclear countries, the small number of states with access to nuclear technology choosing to pursue nonproliferation through technology denial meant a reinforcement of the economic and development divisions between the Global North and South. Yet, despite these conflicts of interest, the level of discord paled in comparison to the threat of a US-Soviet confrontation. Dissenting voices rarely posed significant obstacles for the prevailing nuclear order.

The collapse of the Soviet Union, however, coincided with the burgeoning forces of globalization in the 1990s. Today, economic development, the spread of innovative capacity, growing population demands, and the resultant explosive demand for energy, have made “dual-use” nuclear technologies as relevant to countries like Uganda as they are to the United States and Japan. The freer flow of dual-use technologies for nuclear and other weapons of mass destruction (WMD), however, means that the ability to contribute materially to WMD supply chain has expanded not only into more governments’ hands, but also to an exponentially growing number of private sector companies and even individuals. Such technology diffusion without proper control-mechanisms could lead to proliferation to state and non-state actors of concern.

Furthermore, in addition to the global security challenges posed by the proliferation of nuclear weapons, the safety of civilian nuclear power plants has re-emerged as an important security issue. The world first faced a major nuclear accident when one of the reactors at the Three Mile Island Nuclear Power Plant experienced a major meltdown in 1979. Further, the world saw the devastating effect of the worst nuclear accident of its time in 1986 when one of the four reactors at the Chernobyl Nuclear Power Plant in Ukraine (part of the Soviet Union at the time of the accident) experienced a meltdown. The accident at the Fukushima Dai-Ichi Nuclear Power Plant in March 2011 was a fresh reminder of how nuclear incidents can have a long-term negative impact upon the lives of the residents in the surrounding areas, as well as to the country’s energy supply and level of economic activity. Given the severe disruption in civil life caused by accidents at nuclear power plants, not only disaster-resilience and accident preparedness trainings, but also the physical security of nuclear power plants as part of a nation’s critical infrastructure, are important homeland security concerns.³

These developments—spawned by population growth, globalization, the rise of catastrophic terrorism, economic development, and a growing restlessness with the established post-war order—present the United States and Japan with unprecedented new challenges that impact both governments’ security and economic objectives. Yet, as the world witnesses the unprecedented intersection of security, development, economic, and business interests in the nuclear space, this new era also presents Washington and Tokyo with extraordinary new opportunities to leverage agendas and capitalize upon synergies between seemingly disparate policy and financial interests.

This chapter argues that we have reached a propitious moment for the United States and Japan to develop a more collaborative nuclear policy. The chapter first discusses the evolving nature of nuclear challenges for the United States and Japan in the post-Cold War era. It then

3 The authors would like to thank Nobumasa Akiyama for sharing the draft of his working paper *Nuclear Security Dimension of the US-Japan Alliance after 3-11* (unpublished).

reviews the existing nodes of cooperation between the United States and Japan on nuclear issues, and discusses why the existing approach to nuclear issue is insufficient today. Finally, the chapter proposes that in order to shape a more effective nuclear strategy, the United States and Japan must reform their policy “toolkits,” develop a “whole-of-government” approach to cross-cutting nuclear issues, and break down the traditional stovepipes in implementing a more nuanced approach to managing complex and interconnected nuclear challenges that is more sensitive to security, development, and global economic realities.

Nuclear Challenges to the United States

Barack Obama’s inauguration as President of the United States in 2009 brought with it a renewed commitment by the United States to work toward the ideal of nuclear disarmament. In a speech delivered in Prague, President Obama declared that the United States would commit itself to the long-term goal of achieving a nuclear weapon-free world.⁴ He made clear that a complete nuclear disarmament is a long-term goal—“perhaps not in my lifetime.” Still, he announced a series of concrete and interconnected steps aimed at the goal of a world free of nuclear weapons including: negotiate a new Strategic Arms Reduction Treaty (New START) with the Russian Federation that would dramatically cut the number of warheads in the strategic arsenals of both nuclear superpowers; aggressively pursue US ratification of the Comprehensive Test Ban Treaty (CTBT), which was signed by President Clinton in 1996, but languished under the failure to gain US Senate ratification; and seek a new treaty that would verifiably end the production of fissile materials intended for use in nuclear weapons. He also declared his intention to strengthen the NPT, in part by building a new framework for civil nuclear cooperation. The president’s plan also included the outline of an international nuclear fuel bank designed to dissuade governments from pursuing an indigenous uranium enrichment capacity. For violators of the treaty, he declared his intention to seek a more rigorous approach to counter such violations, and the threats that arise from them.⁵

President Obama’s strong interest in the issue was further demonstrated in April 2010, when he convened the inaugural Nuclear Security Summit in Washington, DC, gathering 47 heads of state with the goal of redoubling international efforts to secure all vulnerable nuclear material around the world within four years—an ambitious attempt to prevent terrorist groups from acquiring the material necessary to build a nuclear weapon. If implemented, the president’s plan would revolutionize global nuclear relations, diminish the likelihood of a terrorist nuclear incident, and put the world on a clear pathway toward nuclear disarmament.

These moves by the Obama administration reflect the changing US perception of the security challenges posed by nuclear weapons, materials, and related technologies since 2001. The September 11, 2001 terrorist attacks fundamentally altered the threat perception through which the United States views its security environment. The tragedy of that day

4 The White House. “Remarks by President Barack Obama.” Prague, Czech Republic (April 5, 2009). <http://www.whitehouse.gov/the-press-office/remarks-president-barack-obama-prague-delivered>. (Accessed July 1, 2011.)

5 Ibid.

vividly demonstrated that a relatively sophisticated non-state actor such as al-Qaeda had the capacity to visit unfathomable levels of destruction against targets in the United States and beyond.

The subsequent revelation of the proliferation attempts by the AQ Khan network in Pakistan further illustrated the ease with which nefarious actors can give access to sensitive WMD knowledge and hardware to nation-states and non-state actors alike. For well over a decade, Khan's black market in nuclear technologies had spanned the globe, providing a one-stop shop for an untold number of "customers" ranging from North Korea to Iran to Libya. The rogue scientist's distribution network revealed a yawning gap in the wherewithal of existing treaties and agreements that assume nation-states to be the primary actor in the illegitimate transaction of nuclear material and related technology to effectively address the role individuals motivated by ideology (or sheer greed) might be capable of playing in undermining global nonproliferation objectives. In particular, the AQ Khan case stands as a warning not only to the United States but also to the world that the NPT, regardless of strengthened verification mechanisms and adjustments to interpretations of Article IV, may remain insufficient to address challenges posed by rogue non-state actors bent on the acquisition of WMD.

The United States clearly acknowledges this as a major security challenge for the future. Indeed, the 2010 National Security Strategy of the United States points to the "danger posed by the pursuit of nuclear weapons by violent extremists and their proliferation to additional states" as the most serious security challenge that the United States faces today.⁶ Likewise, the 2010 Nuclear Posture Review (NPR) identified the prevention of nuclear proliferation terrorism as the top policy priority for the United States.⁷

Furthermore, the perception of an increased risk of nuclear terrorism has led to the argument, as echoed in the 2010 NPR, that the large number of nuclear warheads in the existing stockpile is no longer either appropriate or necessary to address today's nuclear security challenges. In a world that faces a higher risk of nuclear terrorism than nuclear attacks in warfare, maintaining capabilities for nuclear retaliation is growing increasingly irrelevant in great power relations. In addition, the threat of nuclear retaliation is less and less credible against non-state actors, as the United States would likely use conventional means for retaliation.⁸ If nuclear weapons are going to be the weapons of truly last resort, it does not make fiscal sense for the United States (and other established nuclear powers) to continue to invest in maintaining a large stock. Under these circumstances, the United States can pursue deep cuts in its nuclear arsenal, and do so without compromising its security and that of its allies. The 2010 NPR, echoing President Obama's Prague speech, reiterated the US's intention to reduce the overall number of nuclear weapons, as well as diminish

6 The White House. National Security Strategy of the United States (May 2010). p.4. http://www.whitehouse.gov/sites/default/files/rss_viewer/national_security_strategy.pdf. (Accessed July 24, 2011.)

7 US Department of Defense. *Nuclear Posture Review. Executive Summary* (April 2010). pp. iii-xvi. <http://www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf>. (Accessed November 30, 2011.)

8 Chapter two by Ishikawa provides a more nuanced discussion of the role of nuclear weapons in US national security strategy.

their central role in US defense strategy.⁹ But the NPR argues that the United States would proceed with the reduction of its nuclear force in such a way that it can maintain effective deterrence—both nuclear and through conventional military capabilities—not only for the defense of homeland, but also to reassure US allies and friends who continue to seek US extended deterrence for their own security.¹⁰

However, President Obama's plan was almost immediately frustrated by a series of practical and political challenges at home, making progress toward implementing his agenda halting at best. Indeed, even the president's most notable successes have been either blunted or have come at significant costs. The New START agreement was concluded, ratified, and entered into force on February 5, 2011.¹¹ But even as the president worked to reassert America's moral authority by taking this dramatic next step toward nuclear reductions, the United States made clear that it is still committed to maintaining "a safe, secure, and effective arsenal."¹² As a condition for ratifying the New START treaty, the US Senate insisted upon dramatic increases to the US nuclear weapons budget to underwrite a long-term commitment to the safety and reliability of the arsenal.

Similarly, ratification of the CTBT continues to be considered dead-on-arrival in the US Senate, despite a growing campaign in favor of the treaty within the Obama administration. Moreover, global discussions on strengthening the NPT and concluding a Fissile Material Cutoff Treaty have been discouraging. Achieving a "global cleanout" of nuclear material within the president's four-year time horizon now appears to be a practical impossibility, particularly in a fiscal environment in which the US Congress has proposed significant cuts to key material protection and accounting programs.¹³ Since Prague, the president has repeatedly reminded audiences that nuclear disarmament is unlikely to be achieved anytime soon—if ever in his lifetime. In short, this debate touched off by the president's renewed call for nuclear disarmament has exposed deep divisions and policy clashes between different domestic and international constituencies, each with a vested interest in nuclear issues. These divisions threaten not only international security policy, but given the interconnectedness between nuclear issues more broadly, they may also have negative implications for global development and business expansion.

Nonetheless, the greatest challenge for the United States is to uphold the nuclear nonproliferation regime that it developed in the post-World War II years, and to prevent proliferation of nuclear weapons to countries beyond those acknowledged as "nuclear powers" under NPT regime. With the end of the Cold War, countries that had long aspired

9 Ibid.

10 Ibid. pp.15-35.

11 Department of State. *Remarks: Secretary Hillary Rodham Clinton*. Munich, Germany (February 5, 2011). <http://www.state.gov/secretary/rm/2011/02/156041.htm>. (Accessed July 25, 2011).

12 US Department of Defense. *Nuclear Posture Review*. (April 2010). <http://www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf>. (Accessed July 22, 2011).

13 The Center for Arms Control and Non-Proliferation. "Fact Sheet: Budget Cuts Hurt Nuclear Security Efforts." http://armscontrolcenter.org/policy/nuclearterrorism/articles/fact_sheet_budget_cuts_hurt_nuclear_security_efforts/. (Accessed September 08, 2011). Although the House cuts were ultimately restored by the Senate version of the appropriations bill, the initial reductions suggest a much more competitive fiscal environment, even for these politically popular national security programs.

to become nuclear weapon states became more vocal and, in some cases, more active about their ambitions. India and Pakistan emerged as *de facto* nuclear weapon states after conducting their respective tests in 1998. North Korea crossed the nuclear threshold in 2006, and Iran seems poised to acquire nuclear weapons next. This new era of proliferation foreshadowed a disturbing new security reality, and previously assumed certainties of control were shattered. Therefore, even as the United States identifies nuclear disarmament as the ultimate policy objective, its more immediate focus is on curbing nuclear proliferation and maintain effective deterrence. Civil nuclear energy cooperation and capacity-building assistance to the developing world are also viewed, at least in part, through the prism of national security, and considered largely as means to bolster the nonproliferation effort.

Nuclear Challenges to Japan

Nuclear disarmament has long been one of the top post-World War II foreign policy priorities for Japan. As the only country to have experienced a nuclear attack, Japan has been an enthusiastic advocate of a nuclear-free world, sponsoring annual United Nations General Assembly resolutions on nuclear disarmament for some 14 years.¹⁴ Indeed, following the ratification of the NPT in 1976, Japan has led by example, foregoing the option of becoming a nuclear weapon state, and agreeing to the most stringent safeguard inspections by the International Atomic Energy Agency (IAEA).

At the same time, however, Japan continues to find Cold-War style nuclear challenges in East Asia. Specifically, North Korea's nuclear program—unresolved after years of diplomatic efforts—remains Tokyo's most immediate security concern. China's military modernization, including the development of its strategic forces, presents a medium- to long-term security concern. In spite of the fact that the Southeast Asia Nuclear Weapon-Free Zone Treaty (Bangkok Treaty) has been in effect since 1997¹⁵, Japan has a growing interest in ensuring that the countries in Southeast Asia have domestic capacity—legal and otherwise—to counter nuclear proliferation. To Japan, the discovery of the AQ Khan nuclear proliferation network in 2004 suggested that the Southeast Asian sub-region had become a new proliferation hub. Since then, the perceived advent of the nuclear renaissance

14 "A/RES/65/59." United Nations General Assembly (January 13, 2011). <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/516/08/PDF/N1051608.pdf?OpenElement>. (Accessed September 30, 2011).

15 Hideki Yamaji. *Tounan Ajia Hikakuheiki Chitai Jouyaku no Haikei to Igi* (Background and meaning of Southeast Asia Nuclear Weapon-Free Zone Treaty). *Gaimushou Chosa Geppo* (Ministry of Foreign Affairs Monthly Research Bulletin). No. 3 (2001). http://www.mofa.go.jp/mofaj/press/pr/pub/geppo/pdfs/01_3_1.pdf.

has fuelled a spectrum of government studies and academic reports pointing to a potentially growing opportunity for proliferation to be facilitated in the sub-region.¹⁶

Since signing the mutual security treaty with the United States in 1960, extended nuclear deterrence provided by Washington has been a critical component of the Japanese national defense strategy. This has placed Japan in the self-contradictory position of being one of the most ardent advocates of nuclear disarmament, while at the same time being protected by the US “nuclear umbrella.” The 2010 National Defense Program Guidelines—the document that articulates the Japanese government’s threat perception as well as its security policy priorities—clearly demonstrates this dilemma. It reiterates Japan’s commitment to “proactive” efforts toward nuclear disarmament and nonproliferation, but goes on to describe the US extended nuclear deterrent as “indispensable” for Japanese national security.¹⁷ The world’s renewed focus on nuclear disarmament versus nuclear deterrence has only brought this incongruence to the forefront for policymakers in Japan.

Japan’s nuclear dilemma has also been complicated by the critical role civilian nuclear power plays in Japan’s energy policy. Japan, dependent on foreign imports for the vast majority of its energy, has long considered the development of civilian nuclear energy capacity as an important indigenous supply of electricity. Japan is among the world’s largest users of nuclear energy, ranking third behind only the United States and France.¹⁸ It has a robust civil nuclear energy program with 55 light-water power reactors, operated by 10 electric power companies. Prior to the Fukushima accident, Japan had plans to build more plants in the future.¹⁹ Indeed, in the “Action Plan for a Low Carbon-Emission Society” (*Tei-Tanso Shakai zukuri Koudou Keikaku*), which was adopted by the Aso Cabinet in July 2008, Japan placed nuclear energy at “the core of the efforts to achieve a low carbon emission society.” Before the Fukushima accident, Japan relied on nuclear power for approximately one-third of its total energy consumption, and the Japanese government was on the path to increase its dependence on nuclear power even more.²⁰

16 See for example: “White House Fact Sheet: East Asia Summit”. (November 19, 2011). Accessed at: <http://iipdigital.usembassy.gov/st/english/texttrans/2011/11/20111119151041su0.2769434.html#axzz1iWmgWmUI>; “Preventing Nuclear Dangers in Southeast Asia and Australasia.” The International Institute for Strategic Studies (2009). Accessed at: <http://www.iiss.org/publications/strategic-dossiers/preventing-nuclear-dangers-in-southeast-asia-and-australasia/read-the-dossier/>; Michael S. Malley. “Prospects for Nuclear Proliferation in Southeast Asia, 2006-2016.” *Nonproliferation Review*. Vol. 13, No 3 (November 2006). Accessed at: <http://dx.doi.org/10.1080/10736700601071918>; Tessa de Ryck. “Naïve ASEAN isn’t ready to go nuclear.” *Jakarta Globe* (June 09, 2009). Accessed at: <http://www.thejakartaglobe.com/opinion/naive-asean-isnt-ready-to-go-nuclear/311091>; Mark Fitzpatrick. “ASEAN response to nuclear risks.” *Japan Times* (October 11, 2009). Accessed at: <http://www.japantimes.co.jp/text/eo20091011a1.html>.

17 *Heisei 23-nendo ikou ni kakawaru Bouei Keikaku no Taikou ni tsuite* (National Defense Program Guidelines after FY2012 and after) (December 17, 2011). <http://www.mod.go.jp/j/approach/agenda/guideline/2011/taikou.html>.

18 US Energy Information Administration. “World Net Nuclear Electric Power Generation, 1980-2007.” <http://www.eia.doe.gov/fuelnuclear.html>. (Accessed May 5, 2010).

19 Emma Chanlett-Avery and Mary Beth Nikitin. *Japan’s Nuclear Future: Policy Debate, Prospects, and US Interests*. CRS Report for Congress, RL 34487 (February 19, 2009). p 3.

20 Ministry of Economy, Trade and Industry. *Shin Kokka Energy Senryaku* (New National Energy Strategy) (May 2006). pp. 44-48. <http://www.meti.go.jp/press/20060531004/senryaku-houkokusho-set.pdf>.

Despite Japan's strong commitment to nuclear nonproliferation norms and its steadfast compliance with the nuclear safeguard regulations set forth by the IAEA, its policy to pursue a robust civil nuclear energy sector has often raised questions on whether Japan, under extreme circumstances, may choose to abandon its commitment to its non-nuclear weapon state status. In order to dissuade skeptics, Japan has made a conscious effort to separate the civil nuclear sector from those who engage in the nuclear issue from the national security aspect. Strong pacifist sentiment in Japan during the Cold War reinforced its strictly civil nuclear focus, keeping national security policy experts from participating in the discussion with civil nuclear energy policy experts on matters such as the role of civil nuclear energy, how to ensure the safety of civil nuclear power plants, and whether national security experts need to be brought in to respond to the accidents at nuclear power plants.

Japan's dilemma of balancing its normative commitment to nuclear disarmament and nonproliferation against the necessity to rely on US extended nuclear deterrence has been aggravated by recent developments. On the one hand, nuclear security concerns posed by North Korea and China continues to drive Japan's perception of regional security environment, as well as Japan's desire to continue to seek effective US extended nuclear deterrence. In this context, the US moving to significantly reduce its stockpile of nuclear warheads under the New START Treaty has raised serious concerns among Japanese defense officials about America's ability to continue to provide effective extended deterrence for their country.²¹ On the other hand, the Obama administration's explicit commitment to the ultimate goal of nuclear disarmament provided an unprecedented opportunity for Japan to work with the United States in the area of nuclear nonproliferation and disarmament.

Additionally, alarming trends are appearing in other parts of the Asia-Pacific region. Southeast Asia has undergone remarkable economic expansion over the last few decades. Many states in the region increasingly are trading in high technology goods, including dual-use nuclear materials. Consequently, in many cases, sensitive technologies are being introduced to areas that lack the capacity, including export control, personnel reliability, and physical security standards, to prevent the illicit diversion of such technology. To date, Vietnam, Indonesia, and Malaysia have all expressed an interest in developing civilian nuclear power generation facilities. While partnering with these countries would present a significant economic opportunity for the Japanese civilian nuclear industry, if the partnerships are not pursued under appropriate protocol, the results could present grave security threats for the international community.

However, following the accident at Fukushima, rising concerns about the safety of nuclear power plants revived an anti-nuclear sentiment among the Japanese public. For instance, in September 2011, *Mainichi Shimbun*, one of Japan's major newspapers, released the results of an opinion poll that showed that approximately 60 percent of the respondents believe that Japan should reduce the number of nuclear power plants operating in the country.²² Compounded with Japan's traditional nuclear security concerns as well as burgeoning

21 James L. Schoff. *Realigning Priorities: The US-Japan Alliance and the Future of Extended Deterrence*. Institute of Foreign Policy Analysis (March 2009). <http://www.ifpa.org/pdf/RealignPriorities.pdf>. (Accessed July 25, 2011).

22 *Mainichi Shimbun*. (September 20, 2011). <http://mainichi.jp/select/seiji/yonon/news/20110920ddm001040040000c.html>.

security concerns across Southeast Asia, these dynamics reveal a myriad of both conventional and transnational challenges, as well as compelling economic opportunities, all of which directly impact Japan's national interest and regional stability.²³

The existing US-Japan cooperation on nuclear issues and its limit

The United States and Japan have a long history of bilateral policy consultation in the area of nuclear nonproliferation. They have also established a good level of policy coordination in the existing multinational fora to address nuclear disarmament and nonproliferation including the United Nations, UN Conference for Disarmament (CD), and Nuclear Suppliers Group (NSG). The international community is attempting to respond to the diversification of nuclear security challenges by reinforcing diplomatic efforts to dissuade countries from pursuing nuclear weapon programs. As it has begun to explore ways to address nuclear security concerns posed by non-state actors, the United States and Japan also have begun to work more closely on the multinational initiatives as initiators and active participants.

A statement issued by the White House on November 12, 2010, listed the various areas of US-Japan cooperation in curbing the risks that come from nuclear weapons and its related materials. These include cooperation in: (1) nuclear security; (2) nuclear disarmament; and (3) nuclear nonproliferation and peaceful use of nuclear energy. Support for the IAEA's Additional Protocol, the establishment of the bilateral Nuclear Security Working Group, cooperation toward enactment of the Fissile Material Cutoff Treaty (FMCT), and the promotion of the Peaceful Uses Initiative are some of the examples listed as areas for bilateral cooperation.²⁴ These areas of agreement, combined with increasingly connected economic interests in both countries, open new opportunities for joint programming.

In addition, the US-led Proliferation Security Initiative (PSI), of which Japan is a strong supporter, has evolved into one of the most successful multinational nonproliferation cooperation mechanisms. Launched by then-US President George W. Bush in 2003, the PSI is an international effort aimed at interdicting "the transfer or transport of WMD, their delivery systems, and related materials to and from states and non-state actors of proliferation concern."²⁵ The program involves joint exercises and activities to interdict vessels suspected of carrying WMD or their components on the high seas. To accomplish this, many states have begun to adjust their legal frameworks to permit action, sign shipboarding agreements, and conduct joint exercises. As of November 2010, PSI has conducted 43 joint interdiction training exercises.²⁶ Originally envisioned as part of the 2002 US National Strategy to Combat WMD Proliferation, PSI received its final push toward

23 Chapter three by Jane Nakano in this volume addresses the challenges of the civil nuclear energy sector in more detail.

24 The White House. "Fact Sheet: US-Japan Cooperation on Reducing Nuclear Risks." (November 12, 2010). <http://www.whitehouse.gov/the-press-office/2010/11/12/fact-sheet-us-japan-cooperation-reducing-nuclear-risks> (Accessed November 29, 2011).

25 The White House. "Fact Sheet: Proliferation Security Initiative: Statement of Interdiction Principles." (September 4, 2003). Accessed at: <http://www.whitehouse.gov/news/releases/2003/09/20030904-11.html>.

26 US Department of State. "Proliferation Security Initiative: Calendar of Events." www.state.gov/t/isn/c27700.htm. (Accessed October 28, 2011).

realization when the international community was unable to interdict a shipment of North Korean SCUD missiles to Yemen.²⁷

The G8-led Global Partnership is yet another example of pragmatic US-Japan cooperation. At the Kananaskis G8 Summit in 2002, the world's leading economies announced a new Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (G8GP). Over the course of this last decade, an astonishing 23 donors (22 countries and the European Union) have allocated nearly \$19 billion on an array of efforts designed to accelerate the Cooperative Threat Reduction (CTR) agenda.²⁸ There can be little doubt that cooperation in the Global Partnership has yielded a much safer world. G8GP members have made significant contributions to the construction of three chemical weapons destruction facilities in the Russian Federation leading to a 50 percent reduction in the stockpile to date. In addition, 190 of the 198 decommissioned Russian nuclear submarines have been defueled and dismantled with an additional six in progress. Through cooperative funding efforts, G8GP partners have also funded more than 4,000 research projects and capacity building activities supporting the transition of thousands of scientists into sustainable civilian research.²⁹ Japan has, of course, played a critical role in these cooperative programs.

In the area of civil nuclear energy, the United States and Japan have a long-standing history of cooperation that began in 1968 when the two countries signed the Agreement between the United States of America and Japan on Non-military Use of Atomic Energy. This agreement was since revised in 1988.³⁰ To further facilitate bilateral cooperation in this area, the United States and Japan signed the *United States-Japan Joint Nuclear Energy Action Plan* in April 2007.³¹ Based on the *Action Plan*, the US-Japan Nuclear Energy Steering Committee has been pursuing bilateral cooperation in research and development in nuclear power-related technology, as well as assistance in construction of nuclear power plants. Most recently, the Committee held its meeting on February 28, 2011, about 10 days before the Great Eastern Japan Earthquake.³² The upshot has been a nuclear industry in both countries that is increasingly united in joint partnerships, rather than divided by competition.

Finally, the United States and its allies, including Japan, have sought new technological solutions to addressing the threat of an actual nuclear weapons attack. In particular, following the United States' decision to embark on the development of a ballistic missile defense (BMD) program in earnest, Japan became an important partner in developing

27 Michael Byers. "Policing the High Seas: The Proliferation Security Initiative." *American Journal of International Law*, Vol. 98 (July 2004). pp. 526-45.

28 Martin Matishak. "G8 Nonproliferation Effort Renewed." *Global Security Newswire* (May 31, 2011). http://gsn.nti.org/gsn/nw_20110531_4817.php. (Accessed on October 28, 2011).

29 G20-G8 France 2011. *G8 Global Partnership: Assessment and Options for Future Programming* (May 26-27, 2011). <http://www.g20-g8.com/g8-g20/g8/english/the-2011-summit/declarations-and-reports/appendices/g8-global-partnership-assessment-and-options-for.1354.html>. (Accessed October 28, 2011).

30 Ministry of Education, Culture, Sports, Science and Technology (MEXT). *Nichi-Bei Genshiryoku Kyotei* (Japan-US Nuclear Agreement). http://www.mext.go.jp/component/a_menu/science/anzenkakuho/micro_detail/_icsFiles/afildfile/2009/04/23/s630702_05.pdf.

31 Ministry of Foreign Affairs. *United States-Japan Joint Nuclear Energy Action Plan*. (April, 2007). <http://www.mofa.go.jp/policy/un/disarmament/arms/action0704.pdf>. (Accessed December 1, 2011).

32 Please refer to Chapter three by Jane Nakano for more details on US-Japan cooperation in civil nuclear energy.

critical technologies for BMD. For its part, Japan decided to introduce BMD in December 2003. Since then, the two countries have been closely working together in joint research, development, and production of BMD technologies. Due to the condition that Japan seeks to place on potential third-party transfer of the jointly developed BMD technologies, the bilateral cooperation in this area has been going through difficulties in the last several years, but the issue was resolved at the Security Consultative Committee (SCC) meeting in June 2011.³³ Furthermore, the Japanese government's decision to establish new criteria for Japan's arms exports, relaxing the existing interpretation of Three Principles of Arms Exports—essentially a ban on all of Japan's foreign arms sales—in December 2011 is likely to pave way for a more robust cooperation in seeking the new technologies to address today's nuclear challenges³⁴

As discussed in the introduction of this volume, the US and Japanese governments have compartmentalized their respective approaches to addressing nuclear issues. Such compartmentalization has prevented both US and Japanese governments from having a more coordinated approach over the years. Moreover, it has driven each policy village to focus primarily on its immediate policy goals. This has resulted in the four policy villages pursuing policy objectives that are contradictory, at a minimum.

For instance, the national security policy village has pursued the enhancement of deterrence measures against nuclear proliferation without considering how more robust cooperation in this area could slow efforts by the nuclear disarmament/nonproliferation village toward a nuclear weapon-free world. The efforts made by the nuclear disarmament/nonproliferation and national security policy villages in restricting the access to nuclear materials and related technology by countries that do not have an appropriate set of domestic legal and regulatory frameworks to control them often did not consider that many developing countries often need assistance in building such capacity to comply with nonproliferation regulations. Simply denying them access to nuclear materials and technologies without assisting them in capacity-building can also mean that they are denied the opportunity to utilize advanced technologies to develop their economy. As a consequence, this compartmentalized response not only threatens policy coherence, but also sets up initiatives that are diametrically opposed to each other and fosters unnecessary competition. Without strong leadership from the highest levels of the government and/or other incentives, policy coordination among the four policy villages is even more difficult, thereby making it impossible for the United States and Japan to have an integrated, balanced, and coherent nuclear policy.

International security assistance is one of example of how the United States and Japan can do a better job connecting their respective efforts. The two countries have long been at the forefront of global efforts to prevent the wider diffusion of nuclear weapons and related technologies. Together, Japan and the United States have committed to contributing

33 US-Japan Security Consultative Committee. *Joint Statement of the Security Consultative Committee: Towards a Deeper and Broader Alliance: Building on 50-year Partnership*. (June 21, 2011). http://www.mod.go.jp/j/approach/anpo/201106_2plus2/js1_e.html. (Accessed January 10, 2012).

34 Office of the Prime Minister. *Bouei Soubi Hin nado no Kaigai Iten ni kansuru Kijun ni tuiste no Naikaku Kanbou Chokan Danwa* (Statement by the Chief Cabinet Secretary on the Criteria for Overseas Transfer of Defense and Other Related Technologies) (December 27, 2011). <http://www.kantei.go.jp/jp/tyokan/noda/20111227DANWA.pdf>. (Accessed January 5, 2012).

approximately \$10.2 billion to the G8GP. Although this figure itself is astonishing, it under-represents the full value of both governments' investment in proliferation prevention.

For instance, through its contribution to United Nations International Drug Control Programme Fund and the Crime Prevention and Criminal Justice Fund, Japan supports projects that include improved border management as well as targeted capacity building in the criminal justice field in South Asia, a region of acute proliferation concern. Yet Tokyo has made few efforts to link these programmatic initiatives to Japan's strategic investments in nonproliferation within the Japanese government's policy framework. The Japanese government could not only better leverage its resources under a more coherent nuclear policy, but it could also help solidify new opportunities in the nuclear market that are safe and reputable by better coordinating its various efforts.

In the US, diseconomies of scale and competing national priorities are often more pronounced than in Japan. Even strictly defined nonproliferation appropriations are subdivided between numerous government agencies, thereby creating a competition for resources and donor clients, rather than collaboration to meet mutually agreed upon objectives. Leveraging investments by linking them to the wider Japan-US nuclear nonproliferation strategy would not only yield a more effective nonproliferation strategy, but also promote more traditional criminal measures. Improving these criminal measures is, of course, appealing to regional governments because of the visible link between such an improvement and the governments' high priority interests, including economic stability and development, narcotics control, the control of small arms, counter-piracy, anti-human trafficking, and combating corruption. Furthermore, in an era of economic restraint, such measures would help leverage recipient interest and ensure more sustainable investments.³⁵

International development assistance is another area where efforts by the two governments have been disconnected, yet it represents a potentially pivotal constituency for addressing future nuclear concerns. The leverage held by the United States and Japan over developing markets—many of whom are seen as potential links in an emerging proliferation supply chain—is considerable. According to the Japan International Cooperation Agency (JICA), in 2009 Japan spent \$4.256 billion on international aid. Of the aid provided, more than 50 percent was spent in Asia, around 30 percent in Africa, and the rest distributed throughout Europe, South America, the Middle East, and the Pacific. Each of these targeted regions is high on the list for preventing WMD proliferation. With lax export and border security controls and a growing share of high-technology exports, these regions are becoming likely links on the proliferation supply chain. Yet in Tokyo, as well as in Washington, lacking coordination between the development agencies, the national security agencies, and at times the energy or industry agencies has resulted in missed opportunities to leverage American and Japanese security and development assistance. Providing assistance to developing

35 Brian Finlay, Johan Bergenas, and Veronica Tessler. "Beyond Boundaries in Eastern Africa." The Stimson Center (March 10, 2011). <http://www.stimson.org/images/uploads/research-pdfs/EARptcover.pdf>; Johan Bergenas. "A Piece of the Global Puzzle." The Stimson Center (December 9, 2010). http://www.stimson.org/images/uploads/research-pdfs/A_Piece_of_the_Global_Puzzle.pdf; Brian Finlay, Johan Bergenas, and Veronica Tessler. "Beyond Boundaries in the Middle East." The Stimson Center. <http://www.stimson.org/images/uploads/research-pdfs/MErpt910.pdf>; Brian Finlay. "WMD, Drugs, And Criminal Gangs in Central America." The Stimson Center (August 6, 2010). http://www.stimson.org/images/uploads/research-pdfs/CArpt710_1.pdf.

countries by empowering the recipient countries' government to gain capacity to counter transnational security challenges such as drug-trafficking and illegitimate transfer of small arms have been core competencies and concerns of the US Agency for International Development (USAID) and JICA. Similarly, in coming years, these international development agencies' roles in not only funding but also in engaging the governments of the recipient countries in their efforts to establish more effective export control and other frameworks to restrict illegitimate transfer of nuclear weapons and related technologies will likely increase. By more effectively leveraging existing development assistance activities with existing nonproliferation assistance, the governments of Japan and the United States could not only accelerate global development priorities with security assistance, but could also gain equally from a more sustainable and successful nonproliferation strategy that builds long-term host country buy-in.

Discussion of extended nuclear deterrence and related issues is currently almost exclusively handled by DOS and DOD on the US side, and MOFA and MOD on Japanese side. This discussion should not take place in a vacuum. The United States is moving toward decreased dependency on its nuclear arsenals as a means of deterrence and plans to further reduce its nuclear stockpile. Consequently, the bilateral discussion between these two countries will need to take place in a context that also addresses nuclear security challenges that do not fall in narrowly defined national security areas, such as the risk of proliferation due to insufficient export control and regulations in countries that seek civilian nuclear technology. But there is very little evidence that suggests that bilateral dialogue on extended deterrence will address such issues.

Finally, cooperation in civil nuclear energy is emerging as one of the most challenging areas for the US-Japan cooperation, especially in the aftermath of the accident at Fukushima Dai-ichi Power Station. In particular, enhanced efforts to integrate the business interests of industry by pairing their activities with the defined foreign security and international development objectives of governments can help ensure that industry is transformed from a recalcitrant target into a durable partner. In particular, using the G8GP as a basis for multilateralizing nonproliferation, Tokyo and Washington should promote flexible and innovative new partnerships that better link the national objectives of the donor (more often in the security space) with the needs of the recipient (often linked to economic development).

For instance, the government of Japan not only has an acute national security interest in ensuring the safety of Russia's decaying fleet of nuclear driven submarines docked in the Shkotovo Peninsula near Vladivostok, it also has a clear environmental and economic interest in their safe disposal. Japan's roughly \$100 million investment under the Global Partnership for nuclear submarine disposal therefore has yielded a win-win security, economic, and environmental partnerships for all parties.³⁶ Tokyo and Washington should lead a global campaign to reinvigorate similar nonproliferation activities, particularly in rapidly developing economies where controls over the nonproliferation of sensitive technologies have not kept pace with their diffusion. Furthermore, being under intense

36 G8 Consolidated Report of Global Partnership Projects, June 2004 (May 18, 2011). http://www.canadainternational.gc.ca/g8/summit-sommet/2004/partnership-partenariat_04.aspx?view=d. (Accessed September 30, 2011).

financial pressure, it is critical for governments to begin searching for innovative streams of financial assistance to support global nonproliferation ideals. Here, the private sector could play a key role, not as traditional “donors,” but through the development of mutually beneficial programming where business can do well by doing good. The government of Japan has had enviable relations for a long time with the private sector that can serve as a model for diversifying the funding base for nonproliferation activities around the world.

Conclusion

Nuclear policy today reflects an ever-growing balancing act among considerations for nuclear disarmament, deterrence, and the pursuit of civil nuclear energy. Nuclear policies must be better coordinated in order to achieve the interrelated objectives of deterrence, nonproliferation, and, ultimately, a world free of nuclear weapons—especially in light of an imperfect regulatory environment in which market forces increasingly encourage nefarious behavior up and down the proliferation supply chain. Achieving policy coordination in practice is, of course, an extraordinarily challenging endeavor. Both the United States and Japan operate extensive relevant domestic and international programs in the policy areas of national security, economics, and development. The biggest challenge for the United States and Japan, therefore, in reforming their respective policy toolkits, is how to connect the efforts that both countries have already undertaken and how to move forward from there.

In these efforts, *coordination* and *prioritization* will present a considerable challenge. There is a reason why so-called “whole-of-government” efforts, while flirted with rhetorically by many governments, have shown little evidence of pragmatic and systemic implementation.³⁷ Interagency coordination is generally difficult because it demands government agencies to change the way they have been doing business for decades. The sheer number of stakeholders in nuclear issues, both in the United States and Japan, makes such coordination difficult.

Still, any successful effort to address the nuclear challenge must go beyond conventional compartmentalization of each aspect of nuclear policy. Building better links between the array of the government agencies involved in different aspects of nuclear policy will be central to success. For instance, the United States and Japan may start their efforts to better integrate various aspects of each country’s nuclear policy by attempting to better integrate the activities of USAID and JICA into the security priorities of the DOS, DOD, and DOE in the United States and MOFA, MOD, and METI in Japan.

Of course, this cannot be a one-way street. The development community cannot be asked to better integrate security objectives into their activities without increased sensitivity from the national security agencies to their on-the-ground objectives. Still, given the accessibility of nuclear materials and related technologies by those in the countries that are often subject of development assistance, future overseas development assistance must contribute as much to international security as it does to global economic and human development.

Another challenge, particularly for the United States in its policy coordination with Japan, is a deep division between the civil nuclear energy policy village and the national security

37 See: Stewart Patrick and Kaysie Brown. *Greater Than the Sum of Its Parts? Assessing “Whole of Government” Approaches to Fragile States*. International Peace Institute (2007).

policy village in Japan. In Japan, the Ministry of Defense is not at all engaged in the activities of the civil nuclear energy arena, including R&D and testing. There is wariness among the stakeholders in civil nuclear energy policy villages—particularly on the part of MEXT—about allowing MOD’s participation in the discourse of civil nuclear energy. While the accident at Fukushima Dai-ichi clearly demonstrated the necessity for Japan Self-Defense Forces (JSDF) to develop a capability to respond to nuclear accidents, the area that JSDF is anticipated to play a role is primarily in post-event responses. This often is a problem because in the United States, DOD is strongly represented in inter-agency dialogue on almost all aspects of nuclear issues, while MOD is an active participant only in the national security policy dimensions. Despite the historical hesitance among non-security agencies to engage MOD in the discussion of civil nuclear energy issues, it is urgent that the stakeholders in civilian nuclear energy policy (including the management of nuclear power plants) and national security agencies establish better communication channels.

Prioritization will also present a difficult challenge for the United States and Japan. It is worth remembering that the United States and Japan are fundamentally different because the former is the world’s most powerful nuclear weapon state, while the latter is the most prominent declared non-nuclear weapon state. This fundamental difference in their orientation often manifests itself in the ways the United States and Japan prioritize different nuclear policy issues. This difference has caused diplomatic tension between Washington and Tokyo over North Korea’s nuclear program—Tokyo consistently places the highest priority on complete dismantlement, while the United States, at times, debated whether it should focus more on ensuring that North Korea does not proliferate. The prioritization can be a challenge even in the area of civil nuclear cooperation, in which the United States and Japan has over the years built an interdependent relationship. For the United States, the key priority of its civil nuclear energy policy has always been nonproliferation. On the other hand, Japan identifies energy security as the top priority for its civil nuclear energy policy.

Fiscal constraints in both the United States and Japan, precipitated by the global financial downturn, may be an opportunity to encourage both governments to put more effort into overcoming these challenges. Both Washington and Tokyo face formidable long-term fiscal challenges. This will be sure to drive the two governments to cut spending where they can, pursuing even greater efficacy with their resource allocation. Already, although the United States and Japan remain major nonproliferation donors while continuing their rhetorical focus on proliferation as a central threat to global security, they have reduced or, at a minimum, flat-lined appropriations to international assistance programming. Deep cuts have been proposed by the United States Congress to key nonproliferation programs.³⁸ Japanese investments have similarly flat-lined, all at a time when nuclear dangers are rising in the region and around the world. Washington and Tokyo may leverage the current fiscal challenge as an incentive for better coordination and prioritization of efforts among the four nuclear policy villages.

38 Michelle Marchesano with introduction by Kenneth Luongo. “Funding Analysis of FY11 International WMD Programs: National Nuclear Security Administration and Department of Defense.” Partnership for Global Security Policy Update (January 2011). http://www.partnershipforglobalsecurity.org/PDFFrameset.asp?PDF=fy11_wmd_security_programs.pdf. (Accessed September 30, 2011).

Furthermore, if the two countries can identify short-term goals in nuclear issues that require a “whole-of-government” approach, it can also help Washington and Tokyo with coordination and prioritization. For instance, nuclear security—defined as “the prevention and detection of, and response to, theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities”³⁹—is a policy area that requires a “whole-of-government” approach. The United States and Japan have been actively engaged in Asia Senior-Level Talks on Nonproliferation (ASTOP) since 2003. In the most recent ASTOP held in Tokyo in December 2011, senior officials from ASEAN, China, South Korea, Australia, Canada, New Zealand, the United States, and Japan engaged in a discussion on enhancing nuclear security. Deepening US-Japan bilateral policy coordination in nuclear security can encourage the two governments to overcome the existing compartmentalization of nuclear policy.

The United States and Japan are both committed to bringing about a nuclear-free world. The nature of nuclear challenges undoubtedly is more complex than ever before. The confluence of politics, economics, and development in the nuclear space has never been more evident, nor has it encompassed a larger number of public and private stakeholders. At the same time, the foreign and economic policy goals of the United States and Japan are also converging in a way that is unparalleled in recent history, opening a distinct pathway for renewed cooperation between the two countries in the nuclear realm. The unique history shared by the United States and Japan, the integral role played by each in both global nuclear relations and nonproliferation, common economic objectives, and the geographic and strategic interests of both countries affords them an equally unique opportunity to shape the global debate on nuclear issues. In an era of increasingly rapid change for our nuclear security, the United States and Japan have an obligation to reform both the role of nuclear weapons in our defensive strategies, as well as the toolkit to ameliorate the enduring challenge of nuclear proliferation.

39 “Concepts and Terms.” International Atomic Energy Agency. <http://www-ns.iaea.org/standards/concepts-terms.asp?s=11&l=90#4>. (Accessed January 2, 2012).

Chapter Two

The Japan-US Alliance

Facing the Age of Nuclear Disarmament: From “Extended Deterrence” to “Regional Deterrence”

Taku Ishikawa

In the Security Consultative Committee (also called “two-plus-two”) meeting held in June 2011, Japan and the United States agreed to “the establishment of a bilateral extended deterrence dialogue on a regular basis as a consultative mechanism to determine the most effective ways to enhance regional stability, including those provided by nuclear capabilities, in the near- and long-term.”¹ There, what some Japanese had called for in recent years is now to be realized, though in a somewhat different and more appropriate manner.

After the North Korean nuclear test of October 2006, there have been calls from Japan for a nuclear consultation mechanism within the Japan-US alliance. North Korea’s missile tests and second nuclear test in 2009 further fuelled calls for a parallel organization to the Nuclear Planning Group (NPG) of the North Atlantic Treaty Organization (NATO). This request reflects increasing concern in Japan, at both the governmental and non-governmental levels, with the credibility and effectiveness of the US nuclear umbrella. The emerging momentum for a “World Free of Nuclear Weapons” has increased the concern. The Government of Japan (GOJ), while trying to appear to lead nuclear disarmament in public, made efforts both publicly and privately to prevent the momentum from resulting in premature and excessive cuts by the United States.²

This is another illustration of the well-known difficulty of making nuclear disarmament and extended deterrence compatible. As the United States proceeds with nuclear disarmament, whether in the form of reducing the numbers or role of nuclear weapons, or adopting a

1 “Toward a Deeper and Broader US-Japan Alliance: Building on 50 Years of Partnership.” Joint Statement of the US-Japan Security Consultative Committee (June 21, 2011). <http://www.state.gov/r/pa/prs/ps/2011/06/166597.htm> (Accessed July 1, 2011).

2 The Foreign Ministry’s support for the International Commission on Nuclear Non-proliferation and Disarmament (ICNND), for instance, represents an effort to appeal the GOJ’s strong commitment to nuclear disarmament or abolition on the one hand, but it is also regarded as an effort to control the momentum by urging the commission to propose steps toward a nuclear-free world “realistic” enough to allow for Japan’s continued reliance on the US nuclear umbrella, albeit to a lesser degree, at least during the initial steps, on the other hand. The final report of the commission, while emphasizing the role of conventional weapons in extended deterrence, recognizes that the extended deterrence offered by the United States has functioned as an effective nonproliferation measure, and apparently admits the necessity or inevitability of continued reliance on nuclear deterrence to a certain degree even under the “sole purpose” doctrine. Report of the International Commission on Nuclear Non-proliferation and Disarmament. *Eliminating Nuclear Threats: A Practical Agenda for Global Policymakers* (November 2009). pp. 37, 66-67, 173, 259-260.

no-first-use (NFU) doctrine without any condition, extended deterrence will inevitably be a focal point over which Japan and the United States will either have to seek shared understanding cooperatively or find themselves in stark disagreement. Such a shared understanding between the two states must presuppose decreased reliance on extended nuclear deterrence, if nuclear disarmament is structurally ordained today. It was considered essential, especially in the latter half of the 2000s, for the Nuclear Weapons States to take some nuclear disarmament measures first in order to revitalize and strengthen the Nuclear Nonproliferation Treaty (NPT) regime.³ This is not an easy task by any means.

With finding a way to tackle the complicated task in mind, this chapter discusses the present condition and characteristics of the extended US deterrence in East Asia; what the United States has done so far to enhance a deterrence posture appropriate in the post-Cold War security environment, and drawbacks; how the recent revival of nuclear arms control and disarmament, although spurred by the drawbacks of the emerging deterrence posture, reconfirmed, rather than rejected, the existing shift of the deterrence posture that had been pursued by the Japan-US alliance; and how it requires the alliance to further proceed with the shift while simultaneously trying to mitigate its side effects and maintaining the momentum for nuclear disarmament. Finally, the chapter tries to clarify what should and can be done in the context of the Japan-US alliance, in order to advance towards a nuclear weapon-free world while maintaining effective and credible “regional deterrence.”

In this chapter, the term “deterrence” means “discouraging the enemy from taking military action by posing for him a prospect of cost and risk outweighing his prospective gain,” as defined by Glenn H. Snyder in his classic study of deterrence.⁴ Although the concept of deterrence, as well as its scope of research, has been increasingly expanded,⁵ a rather narrow concept, such as the above, seems appropriate in order to avoid confusing deterrence with other functions generated by deterrence posture,⁶ occasionally found in recent literature. Likewise, extended deterrence should be considered simply as deterrence, as is defined above, provided by a “defender” to a “protégé” against a “potential attacker.”⁷

US Extended Deterrence in Northeast Asia

Contrary to the prevailing perception that Northeast Asia is increasingly unstable, the region has enjoyed a high degree of “crisis stability.” There has been no war between any states or aggression on a major scale in this region since 1953. Neither the Taiwan Strait crisis of 1995-96 nor the first or second North Korean nuclear crises escalated into a war. Although it is almost impossible to prove that deterrence works, it can be assumed that US

3 For instance, the foremost objective of the “four gangs” in proposing a “World Free of Nuclear Weapons” should be interpreted to be reinvigorating the then-lurching nuclear nonproliferation regime.

4 Glenn H. Snyder. *Deterrence and Defense: Toward a Theory of National Security*. Princeton University Press (1961). p. 3.

5 For this tendency, see for example, Jeffrey W. Knopf. “The Fourth Wave in Deterrence Research.” *Contemporary Security Policy*. Vol. 31, No. 1 (April 2010). pp. 1-33.

6 A typical example is “dissuasion,” which means, for instance, trying to have others find it meaningless to have weapons of mass destruction by demonstrating one’s military superiority or preponderance.

7 For these three kinds of actors, see, Paul K. Huth. “Extended Deterrence and the Outbreak of War.” *The American Political Science Review*. Vol. 82, No. 2 (June 1984). p. 424.

extended deterrence, together with the basic or central deterrence provided by its allies in this region, has been working and contributing to the crisis stability.⁸ If this is the case, then the crisis stability is sustained by the huge military superiority of the United States and its allies, as opposed to the conventional wisdom that considers vast imbalances of power to be destabilizing.

US superiority in its nuclear forces is also clear. Compared to the 5,113 nuclear warheads owned by the United States,⁹ as declared at the opening of the 2010 NPT Review Conference, China is estimated to have about 175 nuclear warheads with a very limited number of strategic delivery vehicles.¹⁰ Although China has continued nuclear modernization, a large portion of its small strategic nuclear forces are still vulnerable. Only recently did China start the deployment of DF-31 and DF-31A,¹¹ which are both solid-fueled and road-mobile intercontinental ballistic missiles (ICBMs). The development of a new submarine launched ballistic missile (SLBM) JL-2 is said to have encountered difficulty, and its operational date is uncertain.¹² China's strategic deterrence against the United States presumably has to depend on its capabilities to inflict massive damage upon neighboring states allied or closely associated with the United States. After having massively expanded its short-range missile forces against Taiwan since the late 1990's, China seems to have given priority to the medium-range missile forces lately, as it quadrupled its number of DF-21 medium-range ballistic missiles during 2005-2010.¹³ This development has increased the threat to Japan, but not directly to the United States. Although China is possibly beginning to give more weight to long-range delivery vehicles,¹⁴ it still has a long way to go to achieve even a rough parity with the United States. Therefore, the nuclear superiority of the United States remains intact and will be unlikely to be upset.

8 This is not to deny that the stability of relations between states relies more on other factors, such as shared interests, values, and economic interdependence. However, such an argument is "correct, but irrelevant," as James M. Acton points out. "Most of those who argue that strategic stability remains an important concept do not regard it as the key factor in determining the nature of international relations but, more modestly, as an important metric for assessing nuclear force posture." James M. Acton. *Deterrence During Disarmament: Deep Nuclear Reductions and International Security*. Routledge (2011). p. 19.

9 The number of the US strategic nuclear warheads as of 2010 is estimated to be about 2,000, which is 30 times as large as that of China. Robert S. Norris and Hans M. Kristensen. "US Nuclear Forces, 2010." *Bulletin of the Atomic Scientists*. Vol. 66, No. 3 (May/June 2010). pp. 57-71.

10 Robert S. Norris and Hans M. Kristensen. "Chinese Nuclear Forces, 2010." *Bulletin of the Atomic Scientists*. Vol. 66, No. 6 (November/December 2010). pp. 134-141.

11 The Pentagon estimates that approximately 30 DF-31 and DF-31A ICBMs are deployed already, in addition to 20 DF-4 and 20 DF-5A ICBMs. Office of the Secretary of Defense. *Military and Security Developments Involving the People's Republic of China 2010, Annual Report to the Congress*. US Department of Defense (August 2010). p. 34.

12 Ibid. p. 34. As for the much older JL-1 SLBMs, the Pentagon states that "the operational status of the XIA-class SSBN/JL-1 combination remains questionable."

13 Norris and Kristensen. "Chinese Nuclear Forces, 2010." p. 135.

14 A symptom of such a shift may be emerging, as indicated by the beginning of deploying DF-31 and DF-31A after a long due. However, China has done much less to modernize its strategic forces than widely speculated. For such an assessment, see Patrick M. Morgan and T. V. Paul. "Deterrence among Great Powers in an Era of Globalization." in T. V. Paul, Patrick M. Morgan, and James J. Wirtz, eds., *Complex Deterrence: Strategy in the Global Age*. The University of Chicago Press (2009). p. 270. This article also states that "deterrence is not now at the heart of China's national security policy." Neither is the argument above to assume the centrality of deterrence in the US-China relations, although it perhaps appears to the contrary.

As for North Korea, it is doubtful that it has acquired operational nuclear warheads for ballistic missiles. Dennis C. Blair, the Director of National Intelligence, stated in February 2010, “while we do not know whether the North has produced nuclear weapons, we assess it has the capability to do so.”¹⁵ Although North Korea has tried to develop longer range missiles, it has yet to have reliable retaliatory capabilities against the US homeland. At present, North Korea’s deterrence against the US consists of the threat of taking South Korea, especially densely-populated Seoul, and Japan as hostages by its conventional forces including short-range missiles and Nodong missiles, possibly with chemical warheads. There is also a possibility that North Korea would use its nuclear device in an irregular manner, which cannot be completely negated. To be sure, North Korea poses serious threats directly to South Korea and Japan, and indirectly to the United States. But in the broader context of the overwhelming superiority of the United States, the vulnerabilities of South Korea and Japan vis-à-vis North Korea somewhat paradoxically can be seen as a factor contributing to the crisis stability in Northeast Asia.

In the meantime, US superiority seems to have lessened the other component of “strategic stability”—“arms race stability” in the region.¹⁶ One objective of North Korea’s effort to develop nuclear weapons and ballistic missiles is presumably to acquire capabilities to deter, first indirectly and then directly, the United States. China has, though more slowly than anticipated, been trying to enhance the survivability of its strategic deterrent, in addition to reinforcing short- and medium-range missile capabilities. These developments, in turn, have already encouraged Japan and South Korea to build a missile defense shield, for instance.

Moreover, in contrast to the high degree of crisis stability sustained by the vast US military superiority, Northeast Asia is becoming increasingly unstable at lower levels of the escalation ladder. North Korea has intermittently resorted to acts of provocation, such as the missile tests of April 2009, the *Cheonan* sinking of March 2010, and the shelling of Yeonpyeong Island the following November. China is intensifying its maritime activities, making neighboring countries wary and occasionally resulting in confrontation.

The United States has had concerns about Chinese efforts to secure anti-access and area denial (A2/AD) capabilities since well before the Senkaku (Diaoyu) Islands incident of September 2010. This incident, as well as China’s handling of the issue, seems to have justified and exacerbated US concern. One specific concern of the US is about China’s development of DF-21D anti-ship ballistic missile (ASBM), which will likely be an important element of A2/AD capabilities.¹⁷ Some have recently begun to point out that it “is considered to be at initial operational capability.”¹⁸ DF-21D is estimated to have range of 1,500-2,000 kilometers, and be able to restrict the US Navy’s freedom of action beyond

15 Dennis C. Blair. *Annual Threat Assessment of the US Intelligence Community for the Senate Select Committee on Intelligence* (February 2, 2010). p. 14.

16 Acton points out that “arms race stability” should be replaced by “armament stability,” arguing that arms build-up by a state is motivated more often by domestic politics, bureaucratic politics, and military doctrine of the state than an adversary’s build up, and it “does not always trigger an adversary to do likewise.” Acton. *Deterrence During Disarmament*. pp. 17, 71-82.

17 Office of the Secretary of Defense. *Military and Security Developments*. p. 2.

18 “Navy Intel Chief Discusses China’s Military Advances.” *American Force Press Service* (January 6, 2011), <http://www.defense.gov/news/newsarticle.aspx?id=62346>. (Accessed July 1, 2011).

what China calls “First Island Chain.” It is, therefore, feared that DF-21D, when deployed extensively, will make China more assertive on territorial disputes and make its maritime activities more vigorous.

In sum, in Northeast Asia, we can find a high level of stability farther up the escalation ladder and increasing instability on the lower rungs. This is a manifestation of known as the “stability-instability paradox.”¹⁹ However, as Sugio Takahashi points out,²⁰ the instability at the lower levels does not mean a decrease in the credibility and effectiveness of the US extended deterrence, let alone of the US “nuclear umbrella.” Rather, the logic of stability-instability paradox suggests that the opposite should be regarded as true. Nevertheless, this is where confusion has often arisen, especially in the discourse on extended deterrence in Japan. In fact, some Japanese, both within and outside of the government, have expressed concern about the credibility of the US extended deterrence, of the “nuclear umbrella” in particular, having been unsettled by such incidents as North Korea’s missile tests and the Senkaku incident. As stated above, the increased momentum for a “World Free of Nuclear Weapons” also has functioned as an important catalyst.

However, especially when one brings up nuclear deterrence, it has to be contemplated whether or not what actually happened could and should have been deterred through the cost and risk posed by the nuclear deterrent in the first place. In other words, one must carefully think whether a certain action should be deterred, and if it is to be deterred, how it is to be best achieved. Here attention has to be paid to proportionality, which generally has been considered essential to make a deterrent threat credible.

Post-Cold War Deterrence and the Retreat of Arms Control

In the post-Cold War strategic environment, the threat of nuclear retaliation has become more and more irrelevant in great power relations. Some point out that deterrence among great powers is “recessed” today.²¹ On the other hand, such a threat seems to have become less and less credible in asymmetric relations.²² For example, in US relations with “rogue states,” a nuclear threat by the United States almost always lacks proportionality with what

19 Snyder, in formulating this concept, stated that “the greater the stability of the ‘strategic’ balance of terror, the lower the stability of the overall balance at its lower levels of violence.” Glenn H. Snyder. “The Balance of Power and the Balance of Terror” in Paul Seabury, ed., *The Balance of Power*. Chandler (1965). pp. 198-199.

20 Sugio Takahashi. “Kakuheiki wo Meguru Shomondai to Nihon no Anzenhosho: NPR-Shin START Taisei, ‘Kakuheiki no Nai Sekai,’ Kakudaiyokushi” (Issues of Nuclear Weapons and Japan’s Security: NPR-New START System, a ‘World Free of Nuclear Weapons,’ and Extended Deterrence). *Kaigai Jijo* (The Journal of Area Studies). Vol. 58, No. 7-8 (July-August 2010). p. 48. To be precise, he contends that as the United States and China approach the condition of mutual assured destruction (MAD), the stability-instability paradox will likely come into play.

21 Patrick Morgan and T. V. Paul argue that “today, only general deterrence is at work in great-power relationships, and then only as one of several background conditions contributing to peace and stability,” and call this type of deterrence “recessed general deterrence.” Morgan and Paul. “Deterrence among Great Powers.” p. 259.

22 To be sure, however, no one, except possibly the deterred, can deny the possibility that a threat of nuclear retaliation could be sufficient to discourage the deterred from taking any kind of military action. Therefore, it is always possible that increasing reliance on non-nuclear capabilities could make deterrence less effective.

a rogue state can bring about; that is, what is to be deterred. Besides, nuclear retaliation is expected to be unnecessary, given the strength of US conventional forces vis-à-vis the rogues.

Such an environment is more conducive to “deterrence by denial” than “deterrence by punishment.”²³ At the height of the Cold War, Snyder defined the latter as “deterrence by the threat and capacity to inflict nuclear punishment,” and the former as “deterrence which results from capacity to deny territorial gains to the enemy,” while associating it chiefly with conventional forces.²⁴ During the Cold War, the United States suffered from the dilemma that although a posture of deterrence by punishment had to be complemented by denial capabilities so as to enhance the credibility of deterrence and hedge against a deterrence failure, a denial posture would be very costly and could encourage a deterrence failure by being highly provocative. The United States was sometimes inclined to adopt a denial posture, through the flexible response strategy and the Strategic Defense Initiative (SDI) for instance, but achieving such a posture against the formidable Soviet threat would have been often beyond US financial—and sometimes technological—capabilities. The pursuit of a denial posture also faced opposition of those who preferred deterrence by punishment. The proponents of “deterrence by denial” sometimes called for institutionalizing their preferred posture through an agreement with the Soviet Union, as in the case of the Anti-Ballistic Missile Treaty of 1972, while they were often ridiculed as “arms controllers” by hard-liners. Among the West Europeans, in addition to the arms controllers in the United States, denial deterrence was unpopular due to its heavy cost and provocative nature, despite a “need to rely on the incredible nuclear threat” caused by NATO’s conventional inferiority vis-à-vis the Warsaw Pact Organization.²⁵ Resultantly, the United States had to reconcile itself to a posture largely based on punitive deterrence during the Cold War.

23 For this point, see Taku Ishikawa. “Reisengo no Yokushi Taisei to Dando Missairu Boei” (Deterrence and Ballistic Missile Defense in the Post-Cold War Era) in Satoshi Morimoto, ed., *Misairu Boei: Atarashii Kokusai Anzenhoshō no Koze* (Missile Defense: The New Structure of International Security). The Japan Institute of International Affairs (2002). pp. 207-231; Michael S. Gerson. “Conventional Deterrence in the Second Nuclear Age.” *Parameters*. Vol. 39, No. 3 (Autumn 2009). pp. 32-48. For the observation that much of the recent literature on deterrence focus on deterrence by denial, see, Knopf. “The Fourth Wave in Deterrence Research.” pp. 12-14.

24 Snyder. *Deterrence and Defense*. pp. 14-15. To be sure, both “deterrence by punishment” and “deterrence by denial” are ideal types, which represent the opposite ends of a continuum. In reality, the deterrence posture of the United States, for example, falls somewhere between the two ends, sometimes tilting toward one end or the other. Therefore, any actual deterrence posture has both punitive and denial aspects to varying degrees, as indicated by recent US conception of deterrence. See for instance, US Strategic Command. “Deterrence Operations Joint Operating Concept.” Version 2. US Department of Defense (December 2006). esp. pp. 5-6, 69; The White House. *The National Security Strategy of the United States of America* (March 2006). p. 22; US Department of Defense. *Quadrennial Defense Review Report* (February 2010). p. 14.

25 Timothy W. Crawford. “The Endurance of Extended Deterrence: Continuity, Change, and Complexity in Theory and Policy” in T. V. Paul, Patrick M. Morgan, and James J. Wirtz, eds., *Complex Deterrence: Strategy in the Global Age*. University of Chicago Press (2009). p. 280. For a more detailed view on the allies’ reluctance toward denial deterrence during the Cold War, see Avery Goldstein. *Deterrence and Security in the 21st Century: China, Britain, France, and the Enduring Legacy of the Nuclear Revolution*. Stanford University Press (2000). pp. 35-41.

When the Cold War ended, the United States was able to change its deterrence posture. Despite the “arms control momentum” gained immediately after the Cold War,²⁶ arms controllers soon started to lose ground.²⁷ In particular, their high regard for strategic stability, while making some sense in the context of the Soviet Union in the past, appeared to be increasingly invalid and irrelevant with the change of threat perception. Rogue states, as the new primary threat, were so small in scale compared to the Soviet Union that it appeared to be possible for the United States to take a posture based more on denial capabilities with affordable cost. The United States did not have to consider strategic stability in relations with rogues, over which the United States clearly enjoyed both nuclear and conventional superiority. In other words, it became unnecessary for the United States to avoid being excessively provocative, as far as the rogues were concerned. And above all, to the political leaders of the rogues, the deterrent threat had to be as credible as possible. This is particularly where deterrence by denial would clearly prevail over deterrence by punishment.

Thus, the United States began to lean toward a posture of denial deterrence as soon as the Soviet threat receded, this time in a more realistic and conducive environment. In addition to conventional offensive forces considered useful in intervening in regional contingencies, the United States attached great importance to missile defense. As early as January 1991, in the midst of the Persian Gulf War, the George H. W. Bush administration came up with a refocused missile defense program called the Global Protection against Limited Strikes (GPALS), with more emphasis on theater missile defense. In 1993, the Clinton administration formally put an end to SDI, and commenced a new program named Ballistic Missile Defense (BMD) consisting of Theater Missile Defense (TMD) and National Missile Defense (NMD) as two pillars, with a clear emphasis on the former. BMD was designated as an important means for a new policy of counter-proliferation, which anticipated an option of delivering the first strike against rogue states developing ballistic missiles and weapons of mass destruction (WMD).

The emphasis on missile defense among denial capabilities reflected the recognition that for America, highly invulnerable against the rogue threat, the only major weakness was the increasing vulnerabilities of its important allies against short- and medium-range missiles, possibly with WMD warheads. Being unable to take the American population hostage, the rogues were expected to take neighboring US allies hostage instead in order to deter US intervention in their own region. If this weakness was offset by BMD, especially TMD, the US threat of using its offensive conventional forces should be more credible. David S. Yost argues that “the threat that missile attacks would be defeated might usefully supplement the threat of violent retribution,” although it seems “unlikely that limited and still-experimental missile defenses would by themselves deter missile attacks by a regional power.”²⁸ Here two points must be noted. First, making the threat of using force more credible is identical to

26 Jeffrey A. Larson. “An Introduction to Arms Control” in Jeffrey A. Larson, ed., *Arms Control: Cooperative Security in a Changing Environment*. Lynn Rienner Publishers (2002). pp. 9-10, 12.

27 Taku Ishikawa. “‘Gunbikanri Ron’ to Gunbikanri: Morton H. Halperin no Shucho wo Chushin ni” (‘Arms Controllers’ and Arms Control: The Case of Morton H. Halperin). *Kaigai Jijo* (The Journal of Area Studies). Vol.44, No.9 (September 1996). pp. 60-73.

28 David S. Yost. “New Approaches to Deterrence in Britain, France, and the United States.” *International Affairs*. Vol. 81, No. 1 (January 2005). pp. 104-105.

making the use of force easier. Second, enemy actions targeted by US deterrent capabilities have been extended to include activities that are endogenous in themselves, such as weapons development, beyond the use of those weapons against other states.

Besides, US denial capabilities, including enhanced offensive conventional forces, are inherently multipurpose,²⁹ and have assumed other roles in addition to deterrence, especially in the context of counter-proliferation and humanitarian intervention.³⁰ As Timothy W. Crawford states, “Seeking to forestall challengers and perhaps preempt attacks also has led US planners to seek more strategically valuable conventional forces, blurring cold war distinctions between deterrence roles, between nuclear and conventional forces, and between deterrence capabilities and actual combat resources.”³¹ From this perspective, the doctrine of preemption proclaimed by the George W. Bush administration, though undeniably spurred by September 11, was an almost natural extension of the US inclination toward deterrence by denial since the end of the Cold War.³²

Although many have criticized the insufficiency or stagnancy of the actual reconfiguration of US deterrence posture, President G. W. Bush emphasized a decade after the end of the Cold War the need for “a clear and clean break from the past, and especially from the adversarial legacy of the Cold War” by establishing a “new strategic framework” based on both offensive and defensive forces.³³ Strengthened US denial capabilities have been intermittently employed in actual combat, sometimes in humanitarian interventions and other times in counter-proliferation operations. These military operations and their success have made the US threat of using force more credible, and thereby constituting what is called the “cumulative deterrence” effect.³⁴

The US shift to denial posture has had its own drawbacks. Essentially those drawbacks have arisen from the recognition (further reinforced by the shift) that the United States is seeking to achieve hegemony. As Kenneth N. Waltz says, “In international politics, overwhelming

29 To be sure, nuclear weapons are also multipurpose, at least in theory. For instance, they may be employed not only in a counter-value attack for sheer retaliation, but also in a counter-force attack for damage limitation. However, conventional forces are much more multipurpose, a symbolic illustration of which the United States is now able to carry out “massive retaliation” against any of the rogues only by its conventional forces.

30 For the close correlations between these two, see for instance, Simon Reich. “The Curious Case of Kofi Annan, George W. Bush, and the ‘Preemptive’ Military Force Doctrine,” in William W. Keller and Gordon R. Mitchell, eds., *Hitting First: Preventive Force in US Security Strategy*. University of Pittsburgh Press (2006). Chapter 3.

31 Crawford. “The Endurance of Extended Deterrence.” p. 267.

32 For this point, see Taku Ishikawa. “Bush Dokutorin no Genkai to Kyojinsei: Chuto no ‘Kaku’ wo Megutte” (The Limitations and Robustness of the Bush Doctrine: With a Focus on Nuclear Weapons in the Middle East) in Koichi Mori and Koji Murata, eds, *Amerika no Gurobaru Senryaku to Isuramu Sekai* (America’s Global Strategy and the Islamic World). Akashi Shoten (2009). pp. 159-162; Neil Cooper. “Putting Disarmament Back in the Frame.” *Review of International Studies*. Vol. 32, No.2 (April 2006). p. 367. See also, Galia Press-Barnathan. “The War against Iraq and International Order: From Bull to Bush.” *International Studies Review*. Vol. 6, No. 2 (June 2004). pp. 195-212.

33 George W. Bush. “Remarks by the President to Students and Faculty at National Defense University.” The White House (May 1, 2001). <http://georgewbush-whitehouse.archives.gov/news/releases/2001/05/0010501-10.html>. (Accessed July 1, 2011).

34 For this concept, see for instance, Dolon Almog. “Cumulative Deterrence and the War on Terrorism.” *Parameters*. Vol. 34, No. 4 (Winter 2004/05). pp. 4-19.

power repels and leads others to try to balance against it,”³⁵ whether the balancing is against hard or soft power. Specifically, two points can be made. First, the shift in US deterrence posture might have, somewhat ironically, stimulated rogue states’ ambition for WMD and ballistic missiles. The robustness of US conventional forces, intermittently demonstrated in actual military engagements, might have impressed the rogues—as well as Russia—with the valuable utility of nuclear weapons as an “equalizer.” The other drawback is more definite. That is, it has intermittently caused tension with Russia and China, as in the cases of the US-led intervention in the Kosovo War and the US bombings of Iraq. The shift has also impeded arms control with Russia, as the US BMD program became a primary factor that virtually spoiled the Second Strategic Arms Reduction Treaty (START II). Increasing indifference toward arms control with Russia in the United States, especially among the proponents of denial deterrence, also contributed to the stagnancy of arms control after the conclusion of START II in January 1993. During the Clinton administration, a nuclear arms control treaty with Russia was not reached. The G. W. Bush administration only concluded the Strategic Offensive Reduction Treaty (SORT or the Moscow Treaty), which was very lax and crude in many ways,³⁶ after announcing its withdrawal from the Anti-ballistic Missile (ABM) Treaty of 1972.

Instead, the United States began to attach far greater importance to nonproliferation after the Cold War. As indicated by the counter-proliferation initiative increasingly endorsed by military capabilities, US policy toward WMD proliferation took on more and more of what an analyst calls “coercive nonproliferation.”³⁷ This tendency reached its peak with the Iraq War, and soon exposed its serious limitations. The 2005 NPT Review Conference, failing to adopt consensus on a final document, was an important watershed. The shared realization came to be that, with US power on the wane, in order to revitalize the nuclear nonproliferation regime the United States would have to advance nuclear arms reduction with Russia. However, the United States did not abandon what it had pursued since the end of the Cold War. The manner of the pursuit and its appearance had to be changed. It is within this context that the idea of a “World Free of Nuclear Weapons” started to gain a momentum, and even the G. W. Bush administration more or less toned down its “coercive nonproliferation” policy, which was to be followed by the Obama administration’s pursuit of more genuine change in US nuclear policy.

The Revival of Nuclear Arms Control and Disarmament and Extended Deterrence

With regard to extended deterrence, the United States also shifted toward denial deterrence after the Cold War. Existing US alliances have been strengthened or adjusted to new security environments. On the whole, the United States has tried to increase the mobility

35 Kenneth N. Waltz. “Structural Realism after the Cold War.” *International Security*. Vol. 25, No. 1 (Summer 2000). p. 28.

36 There is a contrary view that says “the Moscow Treaty limitations running concurrently with the original START I Treaty required deeper reductions and were more restrictive than those contained in the New START treaty.” The New START Working Group. “An Independent Assessment of New START.” Background, No. 2410 (April 30, 2010). p. 2.

37 Thomas M. Nichols. “Anarchy and Order in the New Age of Prevention.” *World Policy Journal*. Vol. 22, No. 3 (Fall 2005). p. 5.

or maneuverability of each alliance so that it and its allies could respond more promptly and effectively to regional contingencies. The US military presence in the allied countries could no longer be a mere “tripwire” guaranteeing US military involvement, or a symbol representing US strategic retaliation.³⁸

The Japan-US alliance was no exception. As a matter of fact, it required more modification than most of the other US alliances, due to the shaky security environment of Northeast Asia. As a result of the “redefinition” of the Japan-US alliance in the latter half of 1990s, it became possible for Japan’s Self-Defense Forces (SDF) to provide logistic support to US forces engaging in military operations in “areas surrounding Japan.” This was followed by a series of agreements between Japan and the United States on the realignment of US forces in Japan, which was a part of the US “Global Posture Review” process, although the actual realignment largely has stagnated due to the deadlock over the relocation of the US Marine Corps’ Futenma Air Base.

Thus, Japan’s reliance on the US extended nuclear deterrence was not left unchanged. Although their implementation was sometimes insufficient, Japan and the United States agreed to decrease the reliance to some extent by redefining the alliance and signing realignment agreements. Nevertheless, as stated above, many Japanese felt more or less unsettled as the idea of a “World Free of Nuclear Weapons” was gaining a momentum, and the Obama administration started to seek to reduce the number and role of nuclear weapons, while North Korea’s nuclear weapons and missile development was moving ahead. This meant that the role of the US “nuclear umbrella” remained, though not entirely intact. At a minimum, it can be said that its reassurance effect on Japan was demonstrated to be highly significant.

Eventually the change in US nuclear policy by the Obama administration turned out to be moderate. The new Strategic Arms Reduction Treaty (New START) with Russia, concluded in April 2010, would limit deployed strategic warheads to 1,550. This can be hardly called “deep cuts” in any sense of the term. On the whole, it is remarkably an “arms control” treaty, with great emphasis on strategic stability, and with a very weak disarmament orientation. On the other hand, the New START includes no limits on missile defenses, at least according to the Obama administration.³⁹ The 2010 *Nuclear Posture Review Report* (NPR), released two days before the signing of the treaty, presented some measures to reduce the role of nuclear weapons. However, they were generally limited. Neither the NFU doctrine nor “sole purpose” declaration were endorsed, although the 2010 NPR went as far as saying, “The fundamental role of US nuclear weapons, which will continue as long as nuclear

38 It could have been literally a “symbol,” as one analyst argues. “The so-called “nuclear umbrella” exists only because the USA is pledged to defend Japan and South Korea, and happens to possess nuclear weapons. The rest is left to the imagination.” Richard Tanter and Peter Hayes. “Beyond the Nuclear Umbrella: Re-thinking the Theory and Practice of Nuclear Extended Deterrence in East Asia and the Pacific.” *Pacific Focus*. Vol. 26, No. 1 (April 2011). p. 15.

39 Needless to say, Russia has a different interpretation on this point, and some critics in the United States have claimed that “Russia might seek, and the United States might agree to, new limits on US missile defense capabilities in the Bilateral Consultative Commission established by the treaty.” Amy F. Woolf. *The New START Treaty: Central Limits and Key Provisions*. CRS Report for Congress (April 21, 2011). p. 28. See also, the New START Working Group. “An Independent Assessment of New START” pp. 6-8.

weapons exist, is to deter nuclear attack on the United States, our allies, and partners.”⁴⁰ The negative security assurance was strengthened, but with an exception.⁴¹ And the NPR clearly stated, as if to cancel out possible disadvantage of that measure, “any state eligible for the assurance that uses CBW [chemical and biological weapons] against the United States or its allies and partners would face the prospect of a devastating conventional military response.”⁴² Although the 2010 NPR explicitly forswore the development of new nuclear warheads, it attached great importance to the sustainability of the US nuclear stockpile and nuclear infrastructure.⁴³

In general, the Obama administration’s deterrence policy has turned out to be an extension of the existing trend since the Cold War’s end; that is to say, the inclination toward a deterrence posture largely based on denial capabilities described above. It seeks to reduce the role of nuclear weapons through strengthening conventional capabilities, which include continued improvements in missile defenses and the Prompt Global Strike (PGS) programs, following the G. W. Bush administration’s “new strategic framework.” In the meantime, efforts continue “at the same time to ensure that nuclear deterrence remains effective for the problems for which it is relevant in today’s world.”⁴⁴ Additionally, extended deterrence, both nuclear and conventional, is held in very high regard as a means of enhancing regional stability and reassuring US allies and partners. The reassurance function of extended deterrence was highly valued in the 2010 NPR, which designated nuclear nonproliferation as the first of its five key objectives.⁴⁵ The high regard for extended deterrence, as well as the deep-rooted domestic opposition to deep cuts to the nuclear arsenal,⁴⁶ has apparently constrained the Obama administration’s disarmament orientation. It also reflects the fact that the administration had close consultations with allies and partners while conducting the Nuclear Posture Review and the New START negotiations.⁴⁷

US allies, including Japan, appeared to be fairly content with the 2010 NPR and the New START, through which the Obama administration is said to have stricken an “exquisite balance” between disarmament and deterrence.⁴⁸ Before the release of the 2010 NPR, some Japanese had expressed concern for possible decommissioning of the nuclear-equipped sea-launched cruise missile (TLAM/N), and some Japanese diplomats reportedly lobbied against

40 US Department of Defense. *Nuclear Posture Review Report* (April 2010). p.15. In addition, “sole purpose” was referred to as a future objective. Ibid. pp. 17, 47.

41 The negative security assurance was declared to be applied only to “non-nuclear weapons states that are party to the Nuclear Non-Proliferation Treaty (NPT) and in compliance with their nuclear non-proliferation obligations.” Ibid. p. 15.

42 Ibid. p. 16.

43 Ibid. pp. 39-42.

44 Ibid. p. 47.

45 Ibid. p. 2.

46 For a view critical of deep cuts, see for instance, Keith B. Payne. “Future of Deterrence: The Art of Defining How Much Is Enough.” *Comparative Strategy*. Vol. 29, No. 3 (July-August 2010). pp. 217-222.

47 See for instance, “Hearing to Receive Testimony on the Nuclear Posture Review.” US Senate, Committee on Armed Services (April 22, 2010). p. 37. <http://armed-services.senate.gov/Transcripts/2010/04%20April/10-37%20-%204-22-10.pdf>. (Accessed July 1, 2011).

48 Takahashi. “Kakuheiki wo Meguru Shomondai to Nihon no Anzenhoshō.” p. 49.

the retirement.⁴⁹ However, after the release of the NPR, few Japanese explicitly criticized the US decision to eliminate TLAM/N.⁵⁰ The process was also extremely important, as “Japanese officials applauded US readiness to hear their opinions and conceded that they had ‘unprecedented’ input into the drafting process.”⁵¹ It is against this background that the NPR stated that “we will *continue* close consultations with allies and partners.”⁵²

However, the United States expects to deal not just with “extended” deterrence provided by the United States, but “regional” deterrence and “regional security architectures” to which allied contributions also will be required. The 2010 NPR states that “enhancing regional security architectures is a key part of the US strategy for strengthening regional deterrence while reducing the role and numbers of nuclear weapons.”⁵³ It also affirmed that, as one of the “key initiatives,” the United States would continue “to work extensively with allies and partners to build enhanced regional security architectures, including non-nuclear capabilities for deterrence, helping to build partner capacity, conducting combined exercises and training, and sustaining a forward presence in key regions.”⁵⁴ Simply put, if an ally supports nuclear disarmament, then it has to contribute to enhancing a regional security architecture, especially in the area of “non-nuclear capabilities for deterrence,” including missile defenses. If an ally dependent upon the US nuclear extended deterrence clings to a certain element of the US nuclear deterrent without doing its part in building an enhanced regional security architecture based more on conventional capabilities, it could be seen as an impediment to nuclear disarmament.

Although the United States seems to be pursuing a “joint Air-Sea Battle concept” as a response to China’s build-up of A2/AD capabilities in particular,⁵⁵ it is not clear what kind of “regional security architecture” the United States is building in the East Asia-Pacific region.⁵⁶ However, the Japan-US alliance is moving in the right direction, gradually

49 “Japan Eager for US to Keep Nuke Deterrence.” *The Japan Times* (November 24, 2009). <http://search.japantimes.co.jp/cgi-bin/nn20091124a1.html>. (Accessed September 15, 2011). The report was later denied by Foreign Minister Katsuya Okada, after the Democratic Party of Japan came into power.

50 For this matter, see Ralph A. Cossa and Brad Glosserman. “Extended Deterrence and Disarmament: Japan and the New US Nuclear Posture.” *The Nonproliferation Review*. Vol. 18, No. 1 (March 2011). pp. 134-135.

51 *Ibid.* p. 130.

52 US Department of Defense. *Nuclear Posture Review Report*. p. 28, Italics added.

53 *Ibid.* p. 32.

54 *Ibid.* p. 33.

55 See for instance, US Department of Defense. *Quadrennial Defense Review Report*. p. 32. For a detailed view of the concept with a focus on the Western Pacific Theater of Operations, see, Jan van Tol with Mark Gunzinger, Andrew Krepinevich, and Jim Thomas. *AirSea Battle: A Point-of-Departure Operational Concept*. Center for Strategic and Budgetary Assessments (2010). There is also a view that in addition to China, Iran is pursuing A2/AD capabilities. See Andrew Krepinevich. *Why AirSea Battle?* Center for Strategic and Budgetary Assessments (2010). However, to be sure, it seems to be getting increasingly questionable how seriously the US government is seeking to realize this concept.

56 Secretary of State Hillary R. Clinton’s speech in January 2010 is sometimes referred to as a speech about US policy on “regional security architecture” in Asia, but it was actually about a more comprehensive “regional architecture” in Asia, instead of “regional security architecture” as used in the NPR 2010. Hillary R. Clinton. “Remarks on Regional Architecture in Asia: Principles and Priorities” (January 12, 2010). <http://www.state.gov/secretary/rm/2010/01/135090.htm>. (Accessed September 15, 2011). Here it should be noted that in the NPR 2010, as well as in the Quadrennial Defense Review Report issued in February 2010, the term “regional security architecture” is used differently than the common usage, apparently with a nearly exclusive emphasis on military posture.

enhancing a denial deterrence posture based increasingly on conventional capabilities, as described above. Japan has already deployed PAC-3 and SM-3 interceptors, although it is not clear that they are sufficient in quantity, and has experience mobilizing the missile defense system in coordination with US forces against a North Korean missile launch. Japan's National Defense Program Guidelines (NDPG) issued in December 2010 endorsed the course that had been taken by the alliance, rather than changing it.⁵⁷

The NDPG, which introduced the concept of a "Dynamic Defense Force," stated that "Japan needs to achieve greater performance with its defense forces through raising levels of equipment use and increasing operations tempo, placing importance on dynamic deterrence, which takes into account such an operational use of the defense forces."⁵⁸ If Japan's SDF is to demonstrate "greater performance" primarily in international peace cooperation activities, such as peace-building and disaster relief operations, two effects can be expected. First, Japan can generate additional deterring effects vis-à-vis existing and potential threats in East Asia, as suggested in the NDPG of 2010. Second, albeit less obvious in the NDPG, Japan can mitigate the fear of being abandoned by the United States, especially when it contributes to situations where the US requests allied assistance. This enhances the deterring effect of the Japan-US alliance, at least supposedly. This is the logic underlying the dispatch of the Ground SDF to Iraq in 2004 when Japan was in the midst of the second North Korean nuclear crisis.⁵⁹ In this sense, as well as in the sense that SDF's "greater performance" can lead to relative decrease in the reliance on US nuclear weapons in the alliance deterrence posture as a whole, it can be said that the NDPG was essentially a continuation of the prior trend, especially from the viewpoint of the shift of deterrence posture.

Thus, although it is inconceivable that the Japan-US alliance will depend exclusively on conventional deterrents in the foreseeable future, both parties have set a course for maintaining effective deterrence while reducing the role of nuclear deterrents. The problem is whether they can really achieve it. Japan often has been unable or slow to implement defense agreements with the United States, even if those that move the alliance in the right direction, as in the case of the Japan-US Guidelines for Defense Cooperation of 1997, a major product of the "redefinition" of the alliance mentioned above. The key will likely be whether Japan can pay a fair share.

Challenges and Prospects

Renewed attention to extended deterrence was largely spurred by the rise of nuclear abolitionism. However, the momentum for a "World Free of Nuclear Weapons" seems to

57 "National Defense Program Guidelines for FY2011 and Beyond." Approved by the Security Council and the Cabinet on December 17, 2010. http://www.kantei.go.jp/foreign/kakugikettei/2010/ndpg_e.pdf. (Accessed September 15, 2011).

58 Ibid. p. 7.

59 To be sure, the GOJ did not advertise ensuring US support in case of emergency on the Korean Peninsula as a purpose of the dispatch. It is difficult to say that the GOJ intended to demonstrate the ability of the SDF by the dispatch at that time.

be already on the wane.⁶⁰ Further reduction of US nuclear weapons seems very unlikely, ironically considerably due to the US strategy of reducing reliance on nuclear weapons while reinforcing conventional capabilities with cooperation from its allies.

In ratifying the New START, the US Senate adopted a resolution obliging the administration to negotiate the reduction of tactical nuclear weapons (TNWs) with Russia. But such talks seem unlikely to get started, primarily due to Russia's reluctance. As Russian Deputy Foreign Minister Sergei Ryabkov said, such talks would be "impossible without a set of other issues: an imbalance of conventional forces, missile defense, and the deployment of arms in space."⁶¹ It is essentially the shift of US deterrence posture, at least according to Russia's assertion, that has caused Russia's reluctance. The Obama administration has tried to mitigate the drawbacks of the shift, but has not by any means ceased the shift itself. In the face of the US conventional superiority, which is to be further enhanced, Russia hardly seems incentivized to decrease its adherence to nuclear forces, both tactical and strategic, although it agreed to the New START.

At the Lisbon Summit of November 2010, NATO and Russia agreed to cooperate on missile defense. Since then they have sought specific ways of cooperation in the NATO-Russia Council, without reaching an agreement. Some agreement may be possible, but will likely be tentative, inevitably leaving some uncertainty for the future. As the agreement eventually loses its ground, US or NATO relations with Russia will become intermittently strained over missile defense, just as in the past.⁶²

Likewise, the reinforcement of other conventional capabilities of the United States, including PGS capabilities and allies' contribution to enhanced regional deterrence, will probably provoke countermeasures by certain states. Some states may increase adherence to WMD, and may spur vertical and horizontal proliferation of WMD. Some may strengthen conventional capabilities as well. Nonetheless, a shift toward denial deterrence is reasonable, especially in regions where the United States and its allies are facing WMD proliferation and/or destabilization at lower levels of the escalation ladder. In fact, the United States regards such a shift as necessary for proceeding with nuclear reductions. Some US allies, however, may renew their interest in extended nuclear deterrence when they find conventional capabilities insufficient to make up for the reduction or loss of a particular nuclear deterrent, while trying to avoid reinforcing their own conventional capabilities. As Michael S. Gerson ingeniously observes:

As the United States seeks to reduce reliance on nuclear weapons by strengthening conventional forces, it has to also work to offset the asymmetric options used to balance

60 See for instance, Zachary Roth. "Global Zero: Obama's Distant Goal of a Nuclear-Free World." *The Atlantic*. (September 29, 2011). <http://www.theatlantic.com/politics/archive/2011/09/global-zero-obamas-distant-goal-of-a-nuclear-free-world/245806/>. (Accessed September 30, 2011); "Obama's Anti-Nuke Push Boggling Down: Experts." *Global Security Newswire*. (September 30, 2011). http://www.globalsecuritynewswire.org/gsn/nw_20110930_5081.php. (Accessed September 30, 2011).

61 "Russia Rejects Immediate Talks on Tactical Nuke Cuts." *Global Security Newswire* (February 8, 2011). http://gsn.nti.org/gsn/nw_20110208_1126.php. (Accessed September 15, 2011).

62 There is a rather optimistic view as well, arguing that as far as major powers cooperate on missile defense, missile defense could contribute, rather than impede, nuclear abolition, as a facilitator of transition to a defense-dominant world. David A. Wilkening. "Nuclear Zero and Ballistic-Missile Defence." *Survival*. Vol. 52, No. 6 (December 2010-January 2011). pp. 107-126.

against its conventional power. Consequently, as the United States expands the role of conventional capabilities in deterrence, a credible nuclear deterrent is still required, at least for the foreseeable future, to help convince current and potential adversaries that nuclear weapons are not an effective tool to restore freedom-of-action or gain coercive leverage over its neighbors or the United States.⁶³

Japan and the United States have to muddle through such complicated situations filled with various dilemmas to keep a nuclear disarmament orientation, or at least making it appear to be maintained, so as to preserve the inherently fragile nuclear nonproliferation regime. They must also attempt to achieve an appropriate “regional security architecture” based more on conventional forces without provoking excessive counterbalancing. Suggesting that in a situation like this Japan can easily be caught in what Snyder calls a “composite security dilemma,”⁶⁴ Takahashi argues that Japan’s SDF should actively participate in the “middle-area” operations, something between peacetime and wartime operations. By so doing, he suggests, the SDF can achieve and demonstrate “greater performance,” while at the same time minimizing its harmful effects.⁶⁵ But the United States can take that attitude as a deflection from what Japan really ought to do. For instance, the so-called Second Armitage-Nye Report, while highly appreciative of Japan’s contribution to the War on Terror, stated that “Japan must make the alliance more equal by adequately providing for more of the areas required for its own defense.”⁶⁶

The present conditions of the alliance seem to require Japan to contribute to building an effective “regional security architecture” in East Asia by doing more “for its own defense.” As Yuki Tatsumi observes, “Without seriously tackling the fundamental challenges that prevent the transformation of the US-Japan alliance, an effort to ‘deepen’ and/or ‘widen’ this alliance will only end up being ‘pie in the sky.’”⁶⁷ To be sure, the SDF’s active engagement in international peace cooperation activities will do some good to its capabilities and to the Japan-US security relationship, but it will probably not be enough. Besides, US patience with Japan’s “free ride” cannot be expected to be high in the age of historic economic and fiscal crisis.

In more concrete terms, with regard to the “regional security architecture” in East Asia, Japan should support the US efforts to counter China’s increasing A2/AD capabilities. In advocating the “joint Air-Sea Battle concept,” for instance, Jan van Toll, assuming a division of labor with the US forces, presents specific recommendations for Japan, such as enhancing the resiliency of military assets and sites, increasing and fully integrating air and missile defense systems, increasing the number of fourth-generation fighters and

63 Gerson. “Conventional Deterrence in the Second Nuclear Age.” p. 44.

64 If a state wants to mitigate a fear of being abandoned by an ally, it should strengthen alliance commitment, but this can in turn provoke an adversary. This is an aspect of a composite security dilemma. Glenn H. Snyder. *Alliance Politics*. Cornell University Press (1997). pp. 194-199.

65 Sugio Takahashi. “Ajia-Taiheiyo Anzenhosho Ahkitekucha to Domei no Yakuwari” (Asia-Pacific Security Architecture and the Roles of Alliances). *Ajia-Taiheiyo no Chiiki Anzenhosho Ahkitekucha: Chiiki Anzenhosho no Jusoteki Kozo* (The Regional Security Architecture of the Asia-Pacific). The Tokyo Foundation (August 2010). pp. 59-61.

66 Richard L. Armitage and Joseph S. Nye. *The US-Japan Alliance: Getting Asia Right through 2020*. Center for Strategic and International Studies (February 2007). p. 20.

67 Yuki Tatsumi. “US-Japan Security Relations: Toward a ‘Deeper and Wider Alliance?’” *Asia Pacific Bulletin*. No. 120 (June 28, 2011). p. 2.

procuring fifth-generation fighters, and expanding anti-submarine warfare capabilities.⁶⁸ It is apparently impossible for Japan to carry out all of them, due to its severe financial constraints, and the Air-Sea Battle concept *per se* may possibly fade out, but some of them can and should be done. It ought to be clarified through close consultations what Japan and the United States should do to address the A2/AD threat in a way beneficial to both states. Through such consultations, the alliance could find some other ways to enhance regional deterrence as well.⁶⁹ The alliance may also find it necessary to seek a coordinated division of labor with other US allies, especially South Korea and Australia, now that wartime control of the allied South Korean forces is expected to be transferred to Seoul in late 2015,⁷⁰ and Canberra has intensified its interests in the wider Asia region and sought to strengthen its security ties with Washington and Tokyo. And as a result of trying to build an effective “regional security architecture” through close consultations, the alliance may come to see some disarmament measures, such as NFU,⁷¹ as feasible.

At the same time, the alliance should make the “regional security architecture” more comprehensive than the US government’s present concept. As the more general usage of the term implies,⁷² the architecture should be constructed to include some cooperative security arrangements with both potential and existing adversaries as well, to mitigate the side effects of enhanced deterrence posture. In this regard, Japan can influence the United States to modify its concept, but Japan should not think that its efforts to make the architecture more comprehensive can replace its contribution to its military aspect.

Admittedly, however, it is at best very difficult for the alliance to build an appropriate regional deterrence posture based primarily on conventional capabilities, due to extremely severe budgetary constraints. In particular, Japan could find enormous difficulties in meeting US demands. As a result, the alliance may perhaps have to depend to some extent

68 Van Tol. *AirSea Battle*. p. 92.

69 For such consultations to be of profound significance, Japan should further enhance information security, as Richard C. Bush points out, “The Japanese government is notoriously ‘leaky,’ which creates a deterrent against sharing sensitive information.” Richard C. Bush. *The US Policy of Extended Deterrence in East Asia: History, Current Views, and Implications*. Foreign Policy at Brookings. Arms Control Series, Paper 5 (February 2011). p. 14.

70 Although it is possible for Seoul to decide to postpone the transfer again, depending on the situation of the Korean Peninsula, its implications seem difficult to tell. The transfer of wartime control, on the one hand, may weaken deterrence against North Korea more or less, which may stimulate Seoul’s nuclear ambition, while it, on the other hand, may give larger freedom of action to the US forces in South Korea. In addition, the two states are expected to renew the nuclear cooperation agreement by 2014. By admitting South Korea’s right to pyro-processing, as is sometimes deemed likely with a new agreement, the United States can possibly make South Korea’s “nuclear option” more open, albeit slightly, than before. Thus the effect of “virtual” nuclear deterrents in this region would be more viable, although it could raise the risk of proliferation. For “virtual arsenal” in Asia, see, for instance, Christopher P. Twomey. “Asia’s Complex Strategic Environment: Nuclear Multipolarity and Other Dangers.” *Asia Policy*. No. 11 (January 2011). p. 67.

71 Although it still seems unlikely for Japan to support NFU, some suggest otherwise. For instance, Gerson states that “Japan has traditionally been a strong opponent of NFU, but statements by high-ranking Japanese officials suggest that this sentiment might be changing.” Michael S. Gerson. “No First Use: The Next Step for US Nuclear Policy.” *International Security*. Vol. 35, No. 2 (Fall 2010). p. 47.

72 William T. Tow and Brendan Taylor, for instance, define the term as “an overarching, coherent, and comprehensive security structure for a geographically defined area, which facilitates the resolution of that region’s policy concerns and achieves its security objectives.” William T. Tow and Brendan Taylor. “What is Regional Security Architecture?” *Review of International Studies*. Vol. 36, No. 1 (January 2010). p. 96.

on a fiction, as if the nuclear deterrent were effective against any level of threat, at least for the time being.⁷³ Although heavy reliance on nuclear deterrence does not necessarily lead to destabilization, if such a situation continues, the “double standards” of the United States and Japan may show more clearly. Unless the belief that peace and stability do not arise from deterrence becomes prevalent within the alliance, the age of nuclear disarmament, albeit still a dubious one, is likely to present the alliance with some difficult choices.

73 Renewed anti-nuclear sentiments in post-March 11 Japan may, perhaps, lead to constraints on the stationing or deployment of any or certain nuclear-powered military equipment, such as nuclear-powered submarines and nuclear-powered aircraft carriers, in Japan by the US forces, let alone by Japan's SDF. If such constraints become severe enough, the deterring effect of the alliance as a whole likely will be undermined. However, indications of such have yet to be found.

Chapter Three

Civilian Nuclear Energy Cooperation between the United States and Japan

Jane Nakano

In the decades following World War II, the United States has become the primary partner for Japan in a range of political, military, economic, and science and technology activities. Civil nuclear cooperation is no exception. The engagement today encompasses science and technology collaboration, policy consultations, and commercial partnerships. In fact, the civil nuclear energy engagement between the United States and Japan is one area of the bilateral relationship that is wide, deep, and inter-dependent.

This chapter outlines key characteristics of bilateral nuclear energy engagement between the United States and Japan, illuminates the scope of bilateral cooperation and how it has flourished under a strong security relationship forged between the two countries, and examines challenges bilateral cooperation faces in the coming decades. This examination may be particularly timely as Japan re-considers the role of nuclear energy in supplying electricity, and as the United States and Japan look to renew the bilateral agreement on civil uses of atomic energy, which is due to expire in 2018.

Nuclear Energy in the United States and Japan

Nuclear energy has been a key part of the electricity supply for the United States and Japan, and the nuclear energy sectors in the two countries have some key commonalities. For example, light water reactors are a dominant type of nuclear power generation technology in both countries. The two countries have a high level of research and development capability with some strong institutional resources, such as national laboratories. There also exists a commercial establishment with a multi-decade involvement in the civil nuclear program in each of the countries where a limited number of players—perhaps like a supplier village—dominate the equipment market. Additionally, the United States and Japan are among the top three countries in terms of the size of commercial fleets of nuclear power plants, with 104 reactors supplying approximately 20 percent of the electricity market in the United States, while—at the beginning of 2011—54 reactors meet approximately 30 percent of the electricity demand in Japan. Bilateral cooperation, however, has persisted despite some major structural differences between the US and Japanese nuclear energy sectors.

In the United States, nuclear energy policymaking is led by elected officials, often with input from advisors. Depending on dynamics within each administration, such policymaking function may belong to a particular individual or institutional entity. For example, the

United States President's Council of Advisors on Science and Technology (PCAST)¹ served as a focal point on nuclear energy policymaking under the Clinton administration, while the Office of Vice President exercised strong leadership under the George W. Bush administration. The picture looks notably different in Japan. Nuclear energy policymaking traditionally has been led by bureaucrats or technocrats, such as the Japan Atomic Energy Commission (referred as JAEC hereafter) and the Ministry of Economy, Trade, and Industry (METI). Established in 1955, JAEC resides in the Cabinet Office and plans, deliberates, and decides basic policies on the promotion of nuclear energy research, development, and utilization. In more recent years, the METI Minister's Advisory Committee for Natural Resources and Energy has been exercising great influence on nuclear energy policy issues. It was under the leaderships of JAEC and METI that the "Plans for Nuclear Energy-Based Nation" were introduced in 2006,² whereby Japan embarked on plans to add new capacity, secure investment for replacement plants, improve operational safety, advance fuel cycle and its industry, secure uranium, deploy fast-breeder reactor cycles, and advance spent fuel management. As the Great Eastern Japan Earthquake and resulting tsunami voided Japanese plans to expand the use of nuclear energy at home, METI is in the process of examining its energy policies, and revising its Basic Energy Plan. The June 2010 version set out to expand the share of nuclear energy from roughly 30 percent in 2008 to 50 percent by 2030 in the country's electricity generation mix, calling for nine new NPPs by 2020, and five additional NPPs by 2030. The revised plan is expected by the summer of 2012.

In terms of where programmatic leadership resides, the Department of Energy (DOE) has been playing the central and dominant role in the United States, while several stakeholders have been exercising leadership in Japan's case. DOE, a Cabinet-level agency of the United States government established in 1977, essentially succeeded from the Atomic Energy Commission (AEC) its responsibilities to manage energy R&D and nuclear weapons-related programs. The nuclear energy and technology matters are handled by the Office of Nuclear Energy within DOE. Nuclear security and safeguard-related programs are handled by the National Nuclear Security Administration, which is a quasi-autonomous agency within DOE. In close collaboration with national laboratories across the country, DOE leads the country's research and development in nuclear science and technology. The national laboratories active in nuclear science and technology R&D include the Idaho National Laboratory, Argonne National Laboratory, and Oak Ridge National Laboratory. Those active in nuclear safeguards and physical protection include the Lawrence Livermore National Laboratory, Los Alamos National Laboratory, and Sandia National Laboratories.

Meanwhile, programmatic leadership has traditionally spread across several institutions in Japan. The basic research was led by the Ministry of Education, some basic-to-advanced intermediary research was led by the Science and Technology Agency (STA), and commercial/advanced research was led by the Ministry of International Trade and Industry (a predecessor to the METI). Pursuant to government restructuring efforts in 2001, the Ministry of Education and the STA merged and became the Ministry of Culture, Education,

1 The United States President's Council of Advisors on Science and Technology is a council that is chartered (or re-chartered) in each administration with a broad mandate to advise the president on science and technology issues.

2 The translation was provided by the author. The document in Japanese is *Genshiryoku Rikkoku Keikaku*.

Sports, Science, and Technology (MEXT). One of the most visible research institutes in terms of bilateral cooperation with the United States is the Japan Atomic Energy Agency (JAEA). JAEA undertakes basic and advanced nuclear research to establish a complete fuel cycle, including fast breeder reactor development and reprocessing technology development. JAEA is a successor organization to the merger between the Japan Nuclear Cycle Development Institute (JNC)—which was responsible for fast breeder reactor and fuel cycle research—and the Japan Atomic Energy Research Institute (JAERI)—which was responsible for reactor R&D, nuclear fusion, and application of atomic energy in the medical and agricultural fields.

The structural difference is notable also for industry regulation. In the United States, the Nuclear Regulatory Commission (NRC) has been the sole authority. An independent agency established in 1974, the NRC succeeded the regulatory function from the Atomic Energy Commission pursuant to the Energy Reorganization Act of 1974. The NRC responsibilities include the regulation of commercial nuclear power plants and other uses of nuclear materials (e.g., nuclear medicine) through licensing, inspection, and enforcement of its requirements. A national regulatory body in Japan has not been independent from the organizational perspective. Until April 2012, the Nuclear and Industrial Safety Agency (NISA) will be housed within METI. Following the Fukushima emergency, where the adequacy of regulatory independence was called into question, NISA will be merged with the Nuclear Safety Commission (NSC) and subsumed to the Ministry of the Environment. Until April 2012, NSC is housed within the Cabinet Office, and authorizes basic application of national safety regulations, as well as administers the regulators and operators. Prior to the government reorganization in 2001, the regulation of research reactors was under the auspices of STA while the regulation of commercial reactors was under the auspices of METI with the exception of enrichment facilities, which was regulated by STA. Additionally, since the Fukushima nuclear emergency, several cabinet-level positions were created: the Minister for the Restoration from and Prevention of Nuclear Accident, and the Minister of State for the Corporation in support of Compensation for Nuclear Damage.³

Lastly, the landscape for the power sector is different between the United States and Japan. The US power sector has a number of companies with diverse interests. Today, there are more than 3,100 electric utilities in the United States, including some 200 stockholder-owned utilities, 2,000 public utilities run by state and local government agencies, and 930 electric cooperatives. Additionally, there are nearly 2,100 non-utility power producers, including both independent power companies and customer-owned distributed energy facilities. Companies determine whether and when to build and/or own a nuclear power plant based on market conditions in the absence of government guidance or public financing support—with some limited exceptions like the federal loan guarantee program. The nuclear power plant operators in Japan are the predominant force in the power sector in Japan. Nine of the ten utilities in Japan own, operate, and distribute nuclear power. Nuclear power plant projects have not been particularly sensitive to market conditions as the use of full cost

3 The Office of Prime Minister. List of Ministers. http://www.kantei.go.jp/foreign/noda/meibo/daijin/index_e.html.

pricing⁴ (i.e., “*houkatsu genka*”) and government subsidies to host municipalities generally off-set any potential business risks conventionally associated with such undertakings.

Civilian Nuclear Energy R&D—Deepening Cooperation

With limited exceptions, such as the French reprocessing technology for the Rokkasho Reprocessing Plant and uranium acquisition from British-German-Dutch consortium of Urenco, the United States has been a dominant partner and player in the post-war development of the nuclear energy program in Japan. Bilateral civil nuclear cooperation began in the mid-1950s. During the occupation, the United States banned nuclear R&D in Japan. It was not until after the conclusion of the 1951 San Francisco Peace Treaty that Japan resumed its efforts to develop a civilian nuclear power generation program. Subsequently, the United States and Japan concluded the Agreement for Cooperation between the Government of Japan and the Government of the United States of America Concerning Civil Uses of Atomic Energy,⁵ in 1955. Initiated by the United States primarily to improve its relationship with Japan and strengthen its new ally against the Soviet bloc and communist influence, the agreement laid the groundwork for US technology assistance,⁶ as well as US provision of enriched uranium and research reactors, including a boiling water reactor that achieved criticality in 1957 and became the first reactor to go on-line in Japan. The 1955 bilateral agreement freed Japan from its earlier vision to incrementally and gradually acquire nuclear technologies, and generated the momentum for more rapid and wide-scale advancement of its nuclear energy program, including indigenous production of a Breeder Reactor in the longer term.⁷

The Agreement has been renegotiated and revised many times to reflect the growing need for enriched uranium in Japan, the modification of the US stance on the scope of spent fuel management in Japan, and the changing global nuclear security landscape. For example, the 1958 agreement enabled the US provision of low enriched uranium to Japan, and the 1968 agreement widened the scope of cooperation to include commercial nuclear reactors. The most significant revision, however, was made in 1988. By replacing a case-by-case approach for the US approval on the Japanese use of US origin fuels, with a prior consent (or “programmatically consent”) approach, the 1988 agreement guaranteed Japan with much desired stability and predictability in establishing domestic nuclear power generation. The agreement is up for renewal in 2018.

4 Note that most commercial nuclear reactors in the United States were also built under traditional rate regulations, where cost recovery was largely guaranteed.

5 The agreement in Japanese is *Genshiryokuno Higunjiteki Riyohnikansuru Kyoryokunotameno Nihonkokuto Amerikagasshuukoku tonoaaidano Kyohtei*.

6 The proposal also contained staff training at the Argonne National Laboratory and at the Oak Ridge National Laboratory, as well as the provision of technical literature. Source: Shingo Tanaka. “Agreement for Cooperation Concerning the Civil Use of Atomic Energy between the US and Japan—Analysis of the Japanese Negotiation Process.” *International Public Policy Research*. p. 148. (*Kokusai Koukyou Seisaku Kenkyu dai 13 kan dai 2 go*).

7 Japan Atomic Energy Commission. *White Paper on Nuclear Energy* (1956). Chapter 7.

Today, bilateral nuclear research collaboration is primarily carried out under the auspices of the United States-Japan Joint Nuclear Energy Action Plan, administered by DOE on the US side and by MEXT and METI on the Japanese side.

The Joint Nuclear Energy Action Plan has a strong foundation in the Joint Statement of June 2006, which was issued by President George W. Bush and Prime Minister Junichiro Koizumi. During the meeting, the two leaders “discussed research and development that will help speed up fast breeder reactors and new types of reprocessing so that we can help deal with the cost of globalization when it comes to energy; make ourselves more secure, economically, as well as make us less dependent on hydrocarbons...”⁸ Building on the political momentum put forth by the two leaders, DOE Secretary Samuel Bodman and METI Minister Akira Amari confirmed in January 2007 that both countries are committed to collaboration on the various aspects of the civilian nuclear fuel cycle, and agreed to develop the Joint Action Plan.⁹ The Joint Action Plan, which is not a legally binding document, clearly stipulates that nothing in this document “adversely affect[s] the implementation of the existing agreements between the United States and Japan, and in particular, the programmatic consents for reprocessing.”¹⁰ In fact, substantively, the collaboration under the plan has its legal foundation on a number of other existing agreements.¹¹

The Joint Action Plan provided architecture for both R&D cooperation as well as policy consultations. Specifically, bilateral R&D cooperation was pursued under the Global Nuclear Energy Partnership (GNEP), with the following foci: fast reactor technology, fuel cycle technology, simulation and modeling, small and medium reactors, safeguards and physical protection, and waste management.¹²

Bilateral policy consultations concern the construction of new nuclear power plants, the establishment of nuclear fuel supply assurance mechanisms, and the expansion of nuclear energy in interested countries.¹³ These efforts sought to stimulate the policy environment for new builds in the United States and for successful commercial endeavors overseas. The specific topics for policy consultations include the status of NRC-certified reactor designs, loan guarantees, nuclear liability on the national and international levels, human resources and institutional development, and export control.¹⁴

The scope of bilateral cooperation was expanded in 2010 following the mutual recognition given by President Barak Obama and Prime Minister Yukio Hatoyama to the role of nuclear

8 Joint Statement by President Bush and Prime Minister Koizumi. Washington, DC (June 29, 2006).

9 United States-Japan Joint Nuclear Energy Action Plan. p. 1.

10 Ibid. p. 3.

11 Such agreements include the *Agreement between the Department of Energy of the United States of America and the Japan Atomic Energy Agency for Cooperation in Research and Development Concerning Nuclear Material Control and Accounting Measures for Safeguards and Nonproliferation* (2006); the *Agreement between the Department of Energy of the United States of America and the Japan Atomic Energy Agency for Cooperation in Research and Development in Nuclear Science and Energy* (2007); the US-Japan agreement on innovative nuclear energy technologies and implementing arrangements (I-NERI) between DOE and MEXT and DOE and ANRE/METI (2004); and the *Generation IV International Forum Framework Agreement and subordinate System Arrangements and Project Arrangements* (2005).

12 United States-Japan Joint Nuclear Energy Action Plan. p. 3-4.

13 Ibid. p. 1.

14 Ibid. p. 6.

energy in each country's pursuit of a clean energy economy,¹⁵ as well as the vision of a future without nuclear weapons.¹⁶ Accordingly, new areas of R&D cooperation were added to the Action Plan: 1) cooperative research on advanced simulations for enhanced seismic safety of nuclear power plants; 2) waste vitrification R&D; 3) development of sensors for under sodium inspection of liquid metal fast reactors; and 4) cooperative research on gas-cooled reactor technology.¹⁷

Additionally, in March 2010, the two countries expressed interest in potential cooperation in the effective use of nuclear power plants, and the peaceful use of nuclear energy in third-party countries.¹⁸ Not only has Japan been a key partner to the United States in terms of bilateral nuclear energy R&D undertakings, but also has been a ready ally in most US-led multi-national nuclear energy initiatives.

A 13 member organization, the Generation IV International Forum (GIF) aims to advance the next generation nuclear energy systems that would use a variety of reactor, energy conversion, and fuel cycle technologies. GIF was initiated by the US Department of Energy in 2000, and counts Japan among one of the first signatories. The US leadership under GIF has included the vice chairmanship of the Steering Committee, while the Japanese leadership has included the chairmanship of the Steering Committee and of the Policy Group.

The International Thermonuclear Experimental Reactor (ITER) project, which has seven member countries today, traces its origin to a collaboration struck in the early 1980s among the United States, Japan, the Soviet Union, and European Union. The project is building the world's largest and most advanced experimental nuclear fusion reactor at Cadarache, France.

Japan, with US support, competed with France in the lengthy and intense site selection. In the end, the main ITER facility was sited in France while another ITER facility was sited in Rokkasho. Also, Japan obtained an agreement to supply the first executive director of ITER in Cadarache, as well as up to 20 percent of its staff.

Finally, Japan was the first country to endorse GNEP, which was introduced in 2006 by the Administration of George W. Bush. Under the GNEP and its successor International Framework for Nuclear Energy Cooperation (IFNEC),¹⁹ Japan serves as Co-chair of the Reliable Nuclear Fuel Supply Working Group and has hosted key IFNEC meetings, such as the Steering Group. The US serves as Steering Group Chair and the Co-Chair of the Infrastructure Development Working Group.

15 White House. Fact Sheet on Japan-US Cooperation on Clean Energy Technologies (November 13, 2009).

16 White House. Japan-US Joint Statement toward a World without Nuclear Weapons (November 13, 2009).

17 United States-Japan Joint Nuclear Energy Action Plan—US-Japan Nuclear Energy Steering Committee Joint Statement (March 2010).

18 *Ibid.* p. 2. The effective use of nuclear power plants work would cover issues associated with light water reactor sustainability and life extension, capacity factor, and up-rate of existing facilities.

19 The Global Nuclear Energy Partnership became the International Framework for Nuclear Energy Cooperation in 2010.

Meanwhile, Japan carefully delineated its nuclear energy R&D as separate from the military sphere throughout the post-war era, and adhered to the Three Non-Nuclear Principles, which stands for the policy of “not possessing, not producing, and not permitting the introduction of nuclear weapons into Japan.”²⁰ The principles were outlined by Prime Minister Eisaku Sato in a speech to the House of Representatives in 1967 amid negotiations over the return of the Ogasawara Islands from the United States. The principles were reiterated in reference to the imminent return of Okinawa from the United States, and the Diet formally adopted the principles as a parliamentary resolution in 1971. Since then, the successive Cabinets of Japan have repeatedly articulated the “Three Non-Nuclear Principles.” While the principles have never been adopted into Japanese law, Japan has placed itself under obligation not to possess or manufacture nuclear weapons through a series of legal arrangements, such as the 1955 agreement with the United States, the Atomic Energy Basic Law, and the Nuclear Non-Proliferation Treaty.

However, bilateral R&D cooperation, particularly those strongly related to the fuel cycle development, has hardly been free from turbulence arising from the military sphere. In fact, the pace of bilateral R&D cooperation has been highly influenced by global security developments and policy responses to them.

India’s atomic weapons tests in the mid 1970s heightened the international sensitivity towards the fuel cycle development. India developed its nuclear bomb from a heavy water moderated reactor from Canada under the guise of peaceful uses. Japan came under diplomatic pressure from the United States, under the Carter administration, which announced the US decision to abandon reprocessing and encouraged others to follow suit. This development coincided with Japanese efforts to begin the “hot operation”²¹ at its Tokai reprocessing project. The Carter administration urged Japan to reconsider the undertaking. Pursuant to the 1955 Agreement,²² Japan’s reprocessing project required US consent as Japan was importing 100 percent of its enriched uranium from the United States. After several rounds of negotiation, Japan and the United States agreed in 1977 on the continuation of the Tokai project with certain restrictions. Under this agreement, Japan could process up to 99 tons of spent fuel at the Tokai facility, but had to store the extracted plutonium for an initial period of two years, instead of converting it to reactor fuel.²³

As means of hedging against the fluidity in US reprocessing policy, the Japanese government in the late 1970s considered acquiring a heavy water reactor from Canada. This development reflected Japanese apprehension over Japan’s continued heavy reliance on the United States for a range of nuclear technologies and business. Diversifying the portfolio of commercial nuclear power plants (NPPs) to include designs that would not require enriched uranium from the United States would free Japan from legal obligations that arise from the use of US-origin fissile materials.²⁴

20 Ministry of Foreign Affairs of Japan. “On the Three Non-Nuclear Principles”. <http://www.mofa.go.jp/policy/un/disarmament/nnp/index.html>.

21 “Hot operation” uses actual spent fuels and, therefore, produces plutonium.

22 Article 8 of the agreement concerns this issue.

23 Japan Atomic Energy Commission, White Paper on Nuclear Energy (1977). Chapter 3.

24 Hitoshi Yoshioka. *Social History of Atomic Energy*. p. 181.

The Japanese anxiety, however, subsided under the Reagan administration, which announced in 1981 that it would “lift the indefinite ban which previous administrations placed on commercial reprocessing activities in the United States,” and a year later approved a set of policies that essentially condoned reprocessing activities by Japan.²⁵ Following this development, Japan became more comfortable with continued partnership with the United States. Japanese and US companies continued licensing production. Japan’s reprocessing initiatives went unhindered under the Clinton administration. Although President Clinton announced that the United States “does not itself engage in plutonium reprocessing for either nuclear power or nuclear explosive purposes,” and discouraged the civil use of plutonium around the world, he also stated the US intent to “maintain its existing commitments regarding the use of plutonium in civil nuclear programs in Western Europe and Japan.”²⁶

During the George W. Bush administration, the bilateral cooperation on a range of fuel cycle technologies flourished under the GNEP, essentially aimed to develop reprocessing technology that is more proliferation resistant, while also limiting the countries with reprocessing capability. GNEP/IFNEC has its domestic foundation in DOE’s Advanced Fuel Cycle Initiative (AFCI). Launched in 2003, the AFCI aimed to develop and demonstrate spent fuel reprocessing/recycling technology after the Clinton administration largely had halted research in this area.

The political climate surrounding reprocessing changed yet again with the inauguration of the Obama administration in 2008. President Obama is not supportive of rapidly commercializing advanced reprocessing technology and the Advanced Fuel Cycle Initiative (AFCI), which serves as domestic foundation of GNEP/IFNEC.²⁷ Although AFCI kept funding levels similar to that under the Bush administration, the program has been refocused on fundamental R&D.²⁸

Commercial Cooperation—Heightening Interdependency

The bilateral relationship is strong in the commercial arena, too. The relationship has some origin in non-nuclear related business engagement between US and Japanese heavy electronics manufacturers prior to World War II. But the strong commercial relationship today is more a reflection of how interests of the US and Japanese nuclear industries are interlocked. Japan needed the United States for initial technological assistance and for political consent in developing a fuel cycle program in ensuing decades as much as the United States needed Japan for the viability of its nuclear industry.

The close relationship began to emerge in the nuclear energy sector in the mid-1960s, when US light water reactor designs became popular. Of the group of Japanese vendors, Mitsubishi reached a PWR technology transfer agreement with Westinghouse in 1961. Toshiba and

25 Anthony Andrews. *Nuclear Fuel Reprocessing: US Policy Development*. CRS Report for Congress (March 27, 2008). p. 1.

26 White House. President Clinton Fact Sheet on Nonproliferation and Export Control Policy. (September 27, 1993).

27 Mary Beth Nikitin, et al. *Managing the Nuclear Fuel Cycle*. Congressional Research Service (March 2011). p. 27.

28 Ibid.

Hitachi, respectively, entered into a similar arrangement with General Electric in 1967 over the BWRs. In the initial decades following World War II, the US nuclear industry was at its prime. US vendors such as General Electric and Westinghouse directly supplied about three dozen reactors overseas during the 1960s, 1970s, and 1980s; the figure has decreased to approximately 10 reactors during the last two decades.²⁹ During these decades, Japan was among the key markets for US reactors and equipment. For example, Japan accounted for 63 percent of US exports of enriched uranium and other nuclear materials between 1994 and 2008, averaging about \$1.4 billion per annum.³⁰ Moreover, Japan was among the major buyers of US reactor components and equipment during the same timeframe, averaging about \$300 million per annum.³¹

In these early years of commercial engagement, American companies often served as the primary contractor and worked closely with Japanese subcontractors while allowing its Japanese junior partners a fine degree of project content value. For example, General Electric supplied Tokyo Electric Power Company with its first reactor—Fukushima Dai-ichi's Unit 1³²—as a turn-key project, but Japanese companies gained up to 56 percent of the project content value.³³ Similarly, the Mihama Unit 1³⁴—the first commercial reactor by Kansai Electric Power Company—was contracted jointly by Mitsubishi and Westinghouse, but Japanese companies supplied up to 62 percent of the project content value.³⁵ Subsequently, Japanese vendors became more active as the primary contractor for domestic projects. Since the 1980s, Japanese companies enjoy approximately 98 to 99 percent of project value on an average reactor project.³⁶

Commercial partnerships between US and Japanese vendors have been accentuated in recent years. For example, Toshiba of Japan purchased Westinghouse in October 2006. This acquisition married Toshiba's BWR technologies and its steam turbine generator technologies to Westinghouse's PWR and BWR technologies and fuel manufacturing capacity. As of 2009, the Toshiba Group supplied 28 percent of 432 units globally (86 PWRs and 26 BWRs). They are currently promoting Generation III+ BRWs and PWRs. Their Advanced PWRs are currently under construction in China—two AP1000 units at two sites each, Sanmen and Haiyang. Their target completion dates are 2013-2014 for Sanmen, and 2014-2015 for Haiyang.

Hitachi and General Electric formed joint ventures in 2007. The partnership between the two companies has strengthened their competitiveness in the entire chain of business in the boiling water reactor field. Hitachi-GE Nuclear Energy, headquartered in Tokyo—with Hitachi equity of 80 percent and General Electric equity of 20 percent—focuses on the domestic market in Japan. GE-Hitachi Nuclear Energy, headquartered in Wilmington,

29 Paul K. Kerr et al. *Nuclear Energy Cooperation with Foreign Countries*. Congressional Research Service (2011). p. 5.

30 Ibid.

31 Ibid.

32 The Fukushima Dai-ichi Unit 1 began construction in 1967 and came online in 1971.

33 Hitoshi Yoshioka, *Social History of Atomic Energy*. *Asahi Shimbun-sha* (1999). p. 117.

34 The Mihama Unit 1 began construction in 1967 and became online in 1970.

35 Hitoshi Yoshioka, *Social History of Atomic Energy*. *Asahi Shimbun-sha* (1999). p. 117.

36 Ibid. p. 118.

North Carolina—with GE equity of 60 percent and Hitachi equity of 40 percent—focuses on markets outside Japan. Specifically brought to the table are General Electric’s global supply network, its licensing and fuel supply business, and Hitachi’s strength in design, manufacturing, and construction.

Mitsubishi of Japan, although known for its partnership with AREVA of France in the form of a 50/50 venture named Atmea since 2007, is hardly absent in the US market. Mitsubishi Nuclear Energy Systems, Inc. (MNES), a wholly owned subsidiary of Mitsubishi Heavy Industries, is headquartered in Arlington, VA. They supply the US market with reactor vessels, steam generators, steam turbines, and combustion turbines, among others. Additionally, Mitsubishi has project-by-project collaboration with US firms like URS and Black & Veatch for engineering, procurement and construction.

Close engagement is not limited to the reactor and equipment sector. Various US and Japanese companies are active along the supply chain. For example, USEC of the United States has historically been a dominant supplier of enriched uranium to Japan. Another example is how Japan Steel Works and Ishikawajima-Harima Heavy Industries (IHI) of Japan have been key manufactures of reactor vessels to US-led projects globally.

The close alignment of business interests between the Japanese and US nuclear industries is a driver behind a series of efforts by the two governments to conclude nuclear cooperation agreements with potential market countries in recent years. A potential customer country must have bilateral cooperation agreements in place with both the Japanese and US governments if a project by the Japan-US consortium is to proceed. For example, the United States has concluded what is commonly referred to as “123 agreements”³⁷ with India (2008), Russia (2008), Turkey (2008),³⁸ and the United Arab Emirates (2009) in recent years. Additionally, the United States will negotiate, re-negotiate, or extend approximately 17 nuclear cooperation agreements in the next three years.³⁹

Meanwhile, Japan also concluded nuclear cooperation agreements with Jordan (2010), Russia (2009), South Korea (2010), and Vietnam (2011). All of them were approved by the Japanese parliament in December 2011. In the fall of 2011, Japan reportedly resumed negotiation of bilateral nuclear cooperation with India. Successful civil nuclear engagement with India is seen as crucial, as India holds strategic importance for the US interest in maintaining regional stability. In fact, most of the counterparts to bilateral nuclear energy cooperation agreements that have been recently concluded or actively pursued—especially India, Turkey, and Vietnam—have strategic significance to the United States and Japan, illuminating how civil nuclear cooperation is never immune from security considerations.

Yet, both the US and Japanese nuclear industries face a great degree of uncertainty in the fast-evolving landscape of the global nuclear energy market today. In the United States, 17

37 US nuclear cooperation agreements are commonly referred to as the “123 agreements” because Section 123 of the Atomic Energy Act mandates a nuclear cooperation agreement to meet nine nonproliferation criteria and directs the President to submit such agreement for Congressional approval.

38 The US-Turkey bilateral agreement was concluded in 2000, with an initial effective period of 15 years, but the cooperation did not begin until 2008.

39 Paul K. Kerr, et al. *Nuclear Energy Cooperation with Foreign Countries*. Congressional Research Service (2011). p. 2.

companies and consortia are reportedly pursuing plans to build more than 30 NPPs today.⁴⁰ Also, 71 reactors have received a 20-year license extension since 2000, including seven units since the Fukushima accident.⁴¹ However, the US nuclear industry continues to struggle due primarily to large construction costs and the availability of economically competitive fossil fuel alternatives today. In fact, no new construction has started since the Three Mile Island accident in 1979. The Tennessee Valley Authority's Watts Bar Unit 1, which began construction in 1973, was the latest reactor in the United States to begin full commercial operation in 1996. Much of the capacity increase has come from the increase in utilization rates.

The picture looks bleaker for Japan. At the beginning of 2011, Japan had 54 reactors in operation and two under construction. Under its Basic Energy Plan released in 2010, Japan would have added nine new nuclear reactors by 2020, and an additional five reactors by 2030. However, the Fukushima nuclear accident voided the plan. The accident, triggered by the Great East Japan Earthquake and tsunami on March 11, 2011, entailed a series of equipment failures, reactor core meltdowns, and releases of radioactive materials into the environment at the Fukushima Dai-ichi Nuclear Power Station. Public skepticism over nuclear safety following the accident has prohibited many Japanese reactors that were shut down for maintenance from restarting, leading to a near-term problem of providing adequate electricity. By May 2012, Japan may have no nuclear reactors online.

The US and Japanese nuclear industries stand at a crossroad. The turbulent global business landscape challenges the competitiveness of the US and Japanese industries and the viability of its commercial partnerships. Relatedly, the fast-evolving landscape questions Japan's identity as the only non-weapons country that also has a full-scale fuel cycle program. Equally, the viability of US leadership in nonproliferation is under scrutiny as its domestic nuclear industry continues to struggle.

The competition among nuclear reactor manufacturers and related businesses is becoming fierce around the world, primarily as established nuclear businesses are based in countries and regions with a relatively slow rate of economic and population growths. For the past few decades, the profile of suppliers remained fairly constant: AREVA of France; Atomic Energy of Canada Ltd.; Siemens⁴² of Germany; Hitachi, Mitsubishi and Toshiba of Japan; Rosatom of Russia;⁴³ and General Electric and Westinghouse of the United States.

The global supply landscape was shaken up when the South Koreans secured a contract with the United Arab Emirate in December 2009 to supply four reactors. The UAE market

40 Nuclear Energy Institute. US Nuclear Power Plants. http://www.nei.org/resourcesandstats/nuclear_statistics/usnuclearpowerplants.

41 Nuclear Energy Institute. License Renewal. Nuclear Energy Institute. http://www.nei.org/resourcesandstats/nuclear_statistics/licenserenewal/.

42 In September 2011, Siemens announced the closure of its nuclear business in accordance with the national government decision to phase out nuclear energy.

43 Rosatom Nuclear Energy State Corporation is a regulatory body of Russia's nuclear complex, but also owns Atomenergoprom, which is a 100 percent state-owned company that includes nuclear power plant operator Energoatom, nuclear fuel producer and supplier TVEL, uranium trader Tekhsnabexport, nuclear facilities constructor Atomenergomash, international nuclear construction and project management company Atomstroyexport, and uranium mining company ARMZ Uranium Holding Co.

had been viewed as a test case for nuclear energy expansion in the Middle East and major suppliers from France, Japan, and the United States fiercely competed for a contract. Most market analysts expected AREVA to land the deal. The Korean victory, therefore, dealt a major blow to its competitors. With assistance from its subsidiaries and other Korean companies like Samsung, Hyundai, and Doosan Heavy Industries, the Korea Electric Power Company led the consortium and committed to providing a full scope of work and services, including engineering, procurement, construction, nuclear fuel and operations, and maintenance support.⁴⁴ The Korean bid in the estimated range of \$20 to \$30 billion was significantly lower than its competitors.⁴⁵ The Korean offer strongly implied that longer-term commercial interests trumped more immediate financial gains in the formulation and submission of their bid.

Only the United States and Japan have multiple vendors offering the full scope of services to make nuclear reactors today. Other existing and emerging supplier countries have a single reactor vendor to bid on international projects. This characteristic is conducive to much more efficient and structured advocacy efforts by the government in a commercial nuclear deal. For example, in early spring 2010, Vietnam chose Russia to build the country's first commercial nuclear power plant at Phuoc Dinh. Vietnam has plans to construct an additional 12 NPPs by 2030.⁴⁶ The Russian victory was contrary to public speculations and a surprise to French and Japanese contenders. The Russian bid included guarantees for a loan for the construction, nuclear fuel, and removal of spent fuel for reprocessing.

To alleviate the perceived handicap rendered by a crowded nuclear industry at home and to promote commercial opportunities for Japanese businesses along the nuclear reactor supply chain, Japan formed the Japan International Nuclear Energy Development (JINED) in summer 2010. JINED is a consortium that consists of three reactor vendors and nine utilities.⁴⁷ The key idea is to streamline Japanese business interests into a single national brand package, and prevent internal competition from undermining the chance of landing a deal. This development closely mirrored the Japanese government's drive—under the New Growth Strategy—to revitalize its economy through facilitating business opportunities abroad in select sectors, including nuclear energy. JINED fulfilled its immediate objective in October 2010, when Vietnam chose Japan to supply the next two reactors at Phuoc Dinh.

The viability of JINED remains to be seen—whether it is an approach with some staying power, or a short-lived experiment. If proven as a viable and sustainable model, the Japanese approach/experiment may improve business prospects for its US vendors and service supplier partners. Meanwhile, it is highly unlikely that the US would emulate the Japanese approach, as the relationship between the utilities and vendors in the United States is starkly different from that of Japan. The size and diversity of US utilities do not easily render

44 World Nuclear Association. "UAE Picks Korea as Nuclear Partner." *World Nuclear News*. (December 29, 2009). http://www.world-nuclear-news.org/NN_UAE_picks_Korea_as_nuclear_partner_2812091.html.

45 Amena Bakr and Cho Mee-young. "South Korea wins landmark Gulf nuclear power deal." *Reuters*. (Dec 27, 2009). <http://www.reuters.com/article/2009/12/27/us-emirates-korea-nuclear-idUSLDE5BQ05O20091227>.

46 World Nuclear Association. "Russia to build nuclear plant in Vietnam." *World Nuclear News*. (November 1, 2010).

47 These nine utilities are owners of nuclear power plants. Only one of the ten utilities in Japan—Okinawa Electric Power Co.—does not have NPP.

themselves to be closely incorporated in a government-led arrangement to collaborate with manufacturers in efforts to expand export opportunities.

Furthermore, the JINED approach may trigger some consolidation of the Japanese nuclear industry. Some argue that Japanese vendors are relatively uncompetitive abroad because the expansion capacity for nuclear energy in Japan has been driven by a strong undertone of Japan's industrial/energy strategy, and construction decisions have been largely insensitive to market factors. The very factors that rationalized the consortium approach—largely to assist the survival of such companies—may essentially re-organize/streamline the domestic industry scene.

While the landscape for reactor and equipment suppliers is rapidly evolving, changes are evident on the demand side, too. The demand is expanding much faster outside the traditional markets, giving rise to a renewed attention to nuclear safety and security issues.

In fact, there is a growing interest around the world in acquiring commercial nuclear reactors, especially in Asia and the Middle East, where energy demand is forecast to increase, fueled by economic development and population growth. Global energy consumption is forecast to grow by 50 percent by 2035. About 85 percent of such growth is forecast to come from the developing world, and only about 18 percent from the developed world.⁴⁸ The developing world is also where greenhouse gas emissions are projected to increase. Nuclear energy is starting to attract governments in these regions as a potential, viable policy choice as they strive to reduce dependence on fossil fuels, to address local pollution, as well as to enhance the security of energy supply. Nuclear energy provides scalability and insulation from volatile and rising fossil-based energy prices. At the beginning of 2011, nuclear power generation existed in approximately 30 countries, with more than 440 power plants in operation, providing about 14 percent of the world's electricity. By 2035, however, about 75 percent of the increase in installed nuclear power capacity is estimated to come from the developing world.⁴⁹ This growth will be led by China (106 gigawatts), Russia (28 gigawatts), and India (24 gigawatts).⁵⁰

Mirroring this trend, there is a growing concern today over a perceived gap between the pace of nuclear power expansion and the weakness of institutional capacity around the world. In the case of China, where approximately 40 percent of the global reactor construction is occurring today, some of the key concerns relate to the lack of regulatory independence, human resources shortage (e.g., regulatory personnel), and the absence of atomic law. For example, China suffers staff shortages from both the operation and regulation perspectives. The staffing level is said to have to increase by four-fold by 2020⁵¹ in order to provide a sufficient level of safety oversight on its growing fleets—an 80GW industry by 2020.⁵² The Fukushima nuclear emergency seems to have given some momentum for introducing

48 US Energy Information Administration. *International Energy Outlook 2011* (September 2011). p. 1.

49 *Ibid.* p. 4.

50 *Ibid.*

51 *World Nuclear News*. "Maintain Nuclear Perspective, China told." (January 11, 2011).

52 World Nuclear Association. "Nuclear Power in China." (September 2011). <http://world-nuclear.org/info/inf63.html>.

atomic laws in China, but it remains unclear what the law may entail, and when it may be finalized.

India, which currently has the sixth largest fleet of nuclear reactors, has five new reactors under construction to generate 10,000 megawatt of power, but comes short of having a fully developed institutional capacity. Largely in response to Fukushima, the Indian parliament in September 2011 began deliberating on the Nuclear Safety Regulatory Authority Bill to establish several regulatory bodies while strengthening the autonomy and independence of its regulators.⁵³

Safety-related institutional capacity is a key area of concern in potential new markets, too. For example, ten of the countries with construction underway or with formal plans to build—including Egypt, Indonesia, Jordan, Kazakhstan, Turkey, the UAE, and Vietnam—have never operated nuclear power plants.⁵⁴ In order to address this capacity gap, some western suppliers have been proactive in engaging the potential customers on the capacity-building front in addition to highlighting the technological attractiveness of their commercial offerings. For example, Japanese companies—either individually or through its industry association—have been providing training courses and workshops on human resources development and safety regulation in countries like China, Jordan, Turkey, and Vietnam.⁵⁵ Also, the US DOE and the NRC have been providing nuclear safety related training to Vietnamese officials.⁵⁶

On the domestic front, the continued lack of consistency in spent fuel management policies and programs, including the fluidity in US stance on reprocessing and programmatic setbacks in launching or operating a permanent repository program in the United States and Japan, casts a cloud on the vibrancy of US and Japanese nuclear industries. In marketing a reactor technology, more suppliers offer the “cradle-to-grave” approach—i.e., a comprehensive package that entails supply of fuels as well as repatriation of spent fuels, which are then buried underground or reprocessed. Of the countries with major vendors, France and Russia already have reprocessing capability. As a major emerging supplier, South Korea is pursuing pyro-processing technology, which is a spent fuel treatment process that is generally considered by US nuclear experts to be a reprocessing technology.⁵⁷ Also, China has been undertaking reprocessing R&D. State media reported a technological breakthrough in its reprocessing program in January 2011.⁵⁸

The United States is essentially committed to an open fuel cycle without political consensus on the permanent repository location. In order to manage the country’s growing stockpile of nuclear waste, in 1982 Congress passed the Nuclear Waste Policy Act (NWPA) to establish

53 World Nuclear News. “Nuclear Regulation Bill Introduced to Indian Parliament.” (September 9, 2011).

54 Mary Beth Nikitin, et al. *Managing the Nuclear Fuel Cycle: Policy Implications of Expanding Global Access to Nuclear Power* (RL34234). Congressional Research Services (March 2, 2011). p. 6.

55 See the website of Japan Atomic Industrial Forum’s International Cooperation Center for detailed information. <http://www.jaif-icc.com/english/activities.html>.

56 Paul K. Kerr, et al. *Nuclear Energy Cooperation with Foreign Countries: Issues for Congress*. Congressional Research Service (2011). p. 2.

57 The South Korean government has mobilized efforts to gain US approval on its pyro-processing research efforts as it re-negotiates the US-ROK civil nuclear agreement that expires in 2014.

58 Zhou Yan. “Nuclear Fuel Feat to Solve Uranium Shortage.” *China Daily* (January 4, 2011).

an explicit statutory basis for the US Department of Energy to dispose of highly radioactive nuclear waste. According to the NWPA, DOE would remove spent nuclear fuel from commercial nuclear power plants, collect a fee from nuclear power providers (the Nuclear Waste Fund), and transport it to a permanent geologic repository or an interim storage facility before permanent disposal. In 1987, Yucca Mountain, Nevada, was designated as the sole candidate site for the repository. In ensuing years, DOE performed detailed site characterization studies at Yucca Mountain and issued a formal finding of suitability for the site in 2002. Throughout the process, Nevada was opposed to the siting of the facility. Also, there have been legislative challenges to the Yucca designation in ensuing years. In 2008, DOE submitted a license application for a HLW repository to the Nuclear Regulatory Commission.

However, the Yucca Mountain project entered a new phase under the Obama administration. President Obama has stated that Yucca Mountain does not represent a viable option for the permanent storage of nuclear waste, and initiated the termination of the project. For example, the administration's FY2010 funding request—as appropriated by Congress—precluded continued work on design and development of the repository. Moreover, the administration's FY2011 budget proposal, which was subsequently approved by Congress, eliminated all funding for the Yucca Mountain project.

Additionally, per the president's request, the Blue Ribbon Commission on America's Nuclear Future (BRC) was formed in 2008 to conduct a comprehensive review of policies for spent fuel management, and to recommend a new plan. The 15-member commission held more than two dozen meetings and hearings between March 2010 and July 2011. Among the recommendations put forward by its interim report, released in July 2011, was to move the nuclear waste program out of DOE and turn it into an independent, government-chartered organization that is subject to financial, technical, and regulatory oversight by the US Congress. More importantly, on the question of reprocessing, the commission was uncertain about the merits of reprocessing, and deferred on making recommendation or commitment on this issue.

Japan's commercial reprocessing program has not had an easy journey, either. Its first successful reprocessing program is the Tokai Reprocessing Plant, in full operation since 1981. This facility has a 210-ton per year uranium reprocessing capacity and is located in Tokai Mura in Ibaraki Prefecture. The plant is operated by JAEA, and overseen by MEXT. Japan also has a reprocessing project in Rokkasho-mura in Aomori Prefecture. The Rokkasho facility is slated to become the country's first commercial reprocessing facility, with the capacity of 800 tons per year. It can store the equivalent spent fuel of up to 3,000 tons of uranium. The facility is operated by the Japan Nuclear Fuel Limited (JNFL). The facility, with an initial construction budget of JPY760 billion in 1993,⁵⁹ was scheduled to be completed in 1997.⁶⁰ The facility has since experienced both cost and schedule overruns. Most recently, in fall 2010, the completion schedule was extended to 2012. A recent series of technical set-backs seem to be attributed to the operation of its melting furnace

59 "Completion of Rokkasho Reprocessing Plant to be Delayed, 200 Billion Yen Cost Increase." *Asahi Shimbun* (February 21, 2011). <http://www.asahi.com/business/update/0221/TKY201102210397.htm>.

60 Ibid.

in the vitrification process. As of February 2011, the project expenditure is estimated to be JPY2.19 trillion.⁶¹

The ever-competitive global nuclear energy marketplace will favor countries that can offer a comprehensive package. A greater clarity and consistency for the spent fuel management policies and programs could improve the business environment for US and Japanese nuclear industries.

Concluding Thoughts

Japan, as a no-weapons state, has carefully kept its nuclear R&D collaboration with the United States in the non-military domain. However, Japan's pursuit of fuel cycle technologies and its collaboration with the United States in this field have not been immune to developments in the global security environment and US policy responses to nuclear security issues. Occasionally, Japanese use of plutonium and its commercial reprocessing program have become a source of contention with the United States. However, it was essentially Japan's status as a key US ally in the Asia-Pacific region that allowed Japan to pursue a range of fuel cycle technologies. The alliance also enabled the two countries to carve out space for bilateral collaboration without undermining the US security policies and objectives as a weapon state. Although a careful demarcation has existed between national defense and nuclear science and technology, Japan's nuclear R&D programs have never been insulated from its national security consideration.

Meanwhile, the United States has benefitted from strong nuclear energy R&D cooperation with Japan, which not only has strong institutional and human resources in the field, but also is a ready endorser and participant in many US-initiated multilateral R&D initiatives. Additionally, the US nuclear industry owes a fine degree of its competitiveness to Japan, initially as a key market for its reactor designs and components, and later as a commercial partner in third-party countries.

As Japan re-examines the role of nuclear energy following the Fukushima nuclear emergency, its decision will have a profound effect on the level of future nuclear R&D efforts at home, and the competitiveness of its industry. In turn, the future of Japanese R&D programs and the industry competitiveness would have significant implications on the future course of US nuclear R&D undertakings as well as the future viability of US nuclear industry given the history of close cooperation and inter-dependency with Japan. Furthermore, a diminished role for nuclear energy may revise Japan's security policy options. Finally, a decline in the competitiveness of US and Japanese nuclear industries may reshape some of the security agenda of the United States, of Japan, and of the US-Japan security alliance if the decline severely limited the two countries' abilities to continue setting the nonproliferation agenda and enforcing norms.

61 Ibid.

Chapter Four

Nuclear Nonproliferation and Japan-US Cooperation

Heigo Sato

The Japanese and U.S. governments issued the Joint Statement of the Security Consultative Committee (2+2), entitled *Toward a Deeper and Broader US-Japan Alliance: Building on 50 Years of Partnership*, in June 2011. It outlined a common strategic objective for both countries, which jointly declared that they “seek the peace and security of a world without nuclear weapons, while maintaining necessary deterrence.” The text continued to say that they would “promote the nonproliferation and reduction of weapons of mass destruction and their means of delivery, and hold states accountable for violating their non-proliferation obligations.”¹

Indeed, the nonproliferation of WMD has been an imminent security issue for both countries for years, and the framework and process through which to promote nonproliferation was defined not only through bilateral context but also by global initiatives. In dealing with this risk, the international community already has a compilation of initiatives on nuclear nonproliferation through which to control and prevent illegitimate transfer. The implementation of these initiatives is structured in multi-layered mechanisms, with the NPT and the UN resolution on nuclear nonproliferation providing norms and framework, IAEA setting the monitoring and inspecting rules, Nuclear Suppliers Group (NSG) and other related regimes performing a regulatory function, and export control by individual states implementing these rules with national jurisdiction measures.

These initiatives together strengthen nuclear nonproliferation. However, as the multiple actors involved in the process have different rules and standards, gaps and loopholes in the supply chain of nuclear-related technologies and materials inevitably arise. Filling these gaps may require elaborated or tailored initiatives at the global, regional, and bilateral level. In so doing, a sophisticated coordination of policy and measures between Japan and the United States would reinstall and strengthen efforts towards nuclear nonproliferation. However, segmented interest and separate initiatives by those who implement nuclear nonproliferation do exist, and often the coordination among those groups is insufficient or lacking.

This paper seeks to explain why those gap and loophole arise, and highlights the importance of Japan-US cooperation and coordination to fill them, since both are committed to nuclear nonproliferation at the government level.

1 The joint statement issued at the conclusion of the June 21, 2011 US-Japan Security Consultative Committee meeting, attended by Secretary of State Hillary Rodham Clinton, Secretary of Defense Robert M. Gates, Minister for Foreign Affairs Matsumoto, and Minister of Defense Kitazawa.

Changing Perception on Nuclear Nonproliferation

Even before the Fukushima accident in March 2011, a change in the tone of the nuclear nonproliferation discussion had been perceived among the nonproliferation and security community. In the NSS 2002, the report outlined the pathway to strengthen nonproliferation as, “we will enhance diplomacy, arms control, multilateral export controls, and threat reduction assistance that impede states and terrorists seeking WMD, and when necessary, interdict enabling technologies and materials.”²

Within the Japan-US bilateral context, the nonproliferation of WMD has been referred to in the SCC’s 2+2 document using various wordings but with specific connotations³.

During the Bush administration, both governments focused on nonproliferation within the context of promoting BMD cooperation, emphasizing the necessity of enhancing a denial capability. Facing the threat of North Korea’s nuclear development and the uncertain prospects of development in the Six-Party Talks, it became a pressing security need, especially for the Japanese side, to secure US commitment. Furthermore, North Korea has been in the spotlight of proliferation activities since the early 90’s when a swap of missile and nuclear-related technology with Pakistan was suspected⁴. The Scud missile export to Yemen was revealed in 2002 when the cargo ship *So San* was interdicted by the Spanish Navy, revealing a portion of their activities⁵.

As a result, with the backdrop of the initiation of the Proliferation Security Initiative (PSI) in December 2003, the 2005 Joint Statement said, “cooperation and consultation between the United States and Japan have been pivotal in promoting nonproliferation, particularly through the Proliferation Security Initiative.” In the same document, both governments outlined a common global strategic objective, referring to their goal regarding nuclear nonproliferation as “[promoting] the reduction and nonproliferation of weapons of mass destruction (WMD) and their means of delivery, including through improved reliability and effectiveness of the Non-Proliferation Treaty, the International Atomic Energy Agency, and other regimes, and initiatives such as the Proliferation Security Initiative”⁶.

The PSI was a significant breakthrough on this issue, as it added an agenda and framework for dealing with nonproliferation into a preexisting formula. For example, the scope of nuclear nonproliferation that was established through the NPT and various export control measures under domestic legislations provided an effective tool in preventing proliferation. The role of Japan and the United States is then to either globally promote the accepted

2 The National Security Strategy of the United States of America. September, 2002.

3 SCC refers to Security Consultative Committee established to consult bilateral security issues between foreign and security leaders of Japan and the United States.

4 Sharon A. Squassoni. *Weapons of Mass Destruction: Trade Between North Korea and Pakistan*. CRS Report to Congress (March 14, 2004); “Pakistan and the North Korea connection.” *Asia Times* (October 22, 2002).

5 The cargo ship *So San* was interdicted by the Spanish Navy, and was to be escorted to Diego Garcia for further inspection. However, lack of authority defined under international law prevented them from proceeding, and the cargo ship was released as a result. “Ship allowed to take North Korea Scuds on to Yemeni port: US frees freighter carrying missiles.” *New York Times* (December 12, 2002).

6 Security Consultative Committee Document. *US-Japan Alliance: Transformation and Realignment for the Future*. (October 29, 2005). The document was concluded by Secretary of State Rice, Secretary of Defense Rumsfeld, Minister of Foreign Affairs Machimura, and Minister of State for Defense Ohno.

nonproliferation formula both individually and collectively, or to exercise pressure against the violating states through international organizations via economic and military sanctions⁷.

However, as the world looked to nuclear technology as a resource for power generation, partly due to the increase in environmental concerns, the risk of nuclear proliferation did increase. The nature of the risk associated with the dispersion of nuclear technologies and materials grow if the actors involved in the supply chain are multiplied, which is especially true when the aspiring country is a latecomer to nuclear energy development. States with less experience in export control, nuclear security, and safety regulations form a vulnerable part of this chain. It is a different type of proliferation issue than the risk posed by a state actively sponsoring nuclear proliferation activities.

Nuclear nonproliferation is a multi-layered effort by various “villages” of the security community, with the NPT providing a comprehensive framework for these different groups. Its composition creates gaps and loopholes in various national implementations of nonproliferation regulation and is vulnerable to willful violation. There is growing perception among the international community that we need to move toward a policy of supply-chain control based on enhanced national governance to prevent proliferation. The task is clear, but the separate villages that make up the nuclear security community do not interact closely with one another to monitor and prevent illicit proliferation. As the NSS 2002 showed how coordination among the initiatives of each village is critical to nonproliferation, this is a serious flaw.

The gaps and loopholes in nuclear nonproliferation emerge in the transaction points of nonproliferation measures. The concept of transaction points is both physical and systemic. For example, it physically emerges when certain items and technologies leave national jurisdiction. If the item and technology cross through border control and are loaded on a train or cargo ship, its physical security is at risk during transit until the cargo reaches its destination and comes under the control of another national jurisdiction. The fundamental idea of the PSI is to fill this gap. In conjunction with PSI, the UN asks member countries to report to the UN committee, mandated under UNSCR 1540, about the condition of local export control legislation⁸. In addition, the UNSCR 1540 mandates that UN member countries must establish transit, transshipment, and broker control under their domestic export control laws and regulations⁹. Closing the security hole in the trade route is the major aim of these efforts.

7 US nonproliferation sanctions include: Executive Order 13382, Iran and Syria Nonproliferation Act, Executive Order 12938, as amended, Iran-Iraq Arms Nonproliferation Act of 1992, Missile Sanctions Laws, Chemical and Biological Weapons Sanctions Laws, Sanctions for the Transfer of Lethal Military Equipment, Iran, North Korea, and Syria Nonproliferation Act Sanctions (INKSNA), Iran Nonproliferation Act of 2000. For the Japanese side, the same contents are outlined under Foreign Trade and Foreign Exchange Law (FTFE), and unilateral sanctions implemented under Article 10 of the FTFE.

8 <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N04/328/43/PDF/N0432843.pdf?OpenElement>.

9 Brian Finlay. “WMD, Drugs, and Criminal Gangs in Central America: Leveraging Nonproliferation Assistance to Address Security/Development Needs with UN Security Council Resolution 1540.” The Stimson Center and the Stanley Foundation. http://www.stimson.org/images/uploads/research-pdfs/CArpt710_1.pdf.

Transaction points in the systemic sense are a gap between nonproliferation regimes and/or domestic control mechanisms. The most obvious example is the relationship between the NPT and IAEA safeguard agreements. Under the NPT, a no-nuclear weapon state retains the right to develop a civil nuclear energy program with assistance from a nuclear weapon state. However, the right is not given unconditionally to a no-nuclear weapon state, as they have to conclude and accept an IAEA safeguard agreement prior to receiving civil nuclear cooperation. IAEA has two safeguard mechanisms: Comprehensive Safeguards Agreements and Additional Protocols¹⁰. Those two agreements are not universally concluded, and concluding both is not a prerequisite to proceeding with cooperation¹¹.

Indeed, the mechanisms through which proliferation is deterred and prevented are distributed around the various nonproliferation initiatives. These initiatives originally come from arms control agreements (NPT, CTBT, FMCT, etc), multilateral export control (Wassenaar Arrangements, AG, NSG, MTCR, etc), or other reasons (Internal compliance program, PSI, CSI, UNSCR1540, etc.). The combination of these initiatives creates a functional organism of nonproliferation. However, as noted earlier, interfacing between these initiatives is not a smooth and organic action, and the lack of a governing authority over these initiatives cast doubt on their overall utility.

This is not to argue that the current nuclear nonproliferation system is an imperfect policy exercise by nature. Nor does it point out that current initiatives are pursuing the wrong approach by not unifying their efforts¹². Rather, it is to point out that a multi-layered approach on nuclear proliferation is putting too much of a burden on national implementations and governance. If the existing consensus on nuclear nonproliferation loses global momentum, the level of commitment by countries involved in these efforts might fade and evaporate.

One way to avoid this risk is to renew and revitalize the norms of nuclear nonproliferation in various settings. In fact, the NPT review conference held every five years was expected to work toward this end. However, the Bush administration denied concluding a final document at the 2005 review conference, which provoked anger within the disarmament community¹³. The final document of the review conference was a benchmark of progress

10 IAEA has three instruments; Verification (Safeguards), Safety (security, science & technology), and Technical Assistance. Ben Sanders. "IAEA Safeguards and NPT." <http://www.unidir.org/pdf/articles/pdf-art2189.pdf>; P.Goldschmidt. "IAEA Safeguards: Dealing preventively with non-compliance." http://carnegieendowment.org/files/Goldschmidt_Dealing_Preventively_7-12-08.pdf.

11 IAEA explains, "The IAEA has safeguards agreements in force with over 170 States around the world. Most of these are comprehensive safeguards agreements concluded pursuant to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). Other types of agreements are known as voluntary offer safeguards agreements (in force with the five NPT nuclear-weapon States) and item specific safeguards agreements (in force with three States not party to the NPT). Also in place is a Model Additional Protocol to safeguards agreements that grants the IAEA complementary verification authority." See <http://www.iaea.org/OurWork/SV/Safeguards/sv.html>.

12 The need for unified control list and procedure is debated frequently. An IISS Strategic Dossier. Preventing Nuclear Dangers in Southeast Asia and Australasia. "The Nuclear Non-Proliferation Regime." pp.21-31.

13 James Traub. "Two Cheers for Multilateralism: Why the nuclear review conference was a minor triumph for Obama." *Foreign Policy* (June 8, 2010).

on nuclear nonproliferation, whereas the international community expected to see further development of nuclear nonproliferation and nuclear disarmament initiatives¹⁴.

Because the 2005 Review Conference failed to reach an agreement on the final document, it became clear that due process is not automatically guaranteed, and momentum must be regained through other means. There is no doubt that most positive contributory effect on the conclusion of the final document of 2010 was President Obama's speech on "A world without nuclear weapons" in Prague in April 2009. In his speech, President Obama emphasized that, "I state clearly and with conviction America's commitment to seek the peace and security of a world without nuclear weapons. This goal will not be reached quickly - perhaps not in my lifetime. It will take patience and persistence. But now we, too, must ignore the voices who tell us that the world cannot change." The speech created a huge wave of expectation amongst a large portion of the international community for the eventual abolition of nuclear weapons. There is no denying that the speech pushed the NPT member states to agree on the 2010 final document at the review conference¹⁵.

Another way to retain momentum on nuclear nonproliferation is to institutionalize the various means and measures that are utilized in a sustainable manner. One of the major problems of current nuclear nonproliferation efforts is that those various measures are located within a multi-layered system¹⁶. As a result, interfacing between the various layers creates gaps and loopholes, which subsequently become a source of diversion. Most of the nonproliferation cooperation seen at global, multilateral, and bilateral levels is focused on this point. However, even if such cooperation is built around controlling the supply chain link, measures are met with countermeasures, and the capability gap between those who prioritize nonproliferation and those who do not is wide. For the most of the developed nations, therefore, nonproliferation, and especially sanctions fatigue is strongly felt¹⁷.

As efforts to close the gaps and loopholes found in nonproliferation initiatives is endless work, there are few countries that could spare their political, economic, and administrative resources on this matter. Given the ongoing global state of economic recession, even the most eager of countries may be overburdened. Because of this, the most productive

14 In the run up to the 2010 Review Conference, Arms Control Today summarized an idea that came up in the 2005 Conference based on policy tools outlined in the 2000 final document and made a comprehensive proposal. Cole Harvey with the ACA Research Staff. "Major Proposals to Strengthen the Nuclear Nonproliferation Treaty: A Resource Guide for the 2010 Review Conference." (March 2010).

15 In his Prague speech, President Obama referred to strengthening NPT and argued, "we will strengthen the nuclear Non-Proliferation Treaty as a basis for cooperation. The basic bargain is sound: countries with nuclear weapons will move toward disarmament, countries without nuclear weapons will not acquire them; and all countries can access peaceful nuclear energy. To strengthen the Treaty, we should embrace several principles. We need more resources and authority to strengthen international inspections. We need real and immediate consequences for countries caught breaking the rules or trying to leave the Treaty without cause."

16 Alexander Nikitin, ed. *Lessons to be learned from Non-Proliferation Failures and Successes*. Amsterdam: IOS Press (2009).

17 Sanctions fatigue was already discussed in the late 90's. Daniel W. Drezner. "Serious about sanctions." *The National Interest* (Fall 1998); Andrew Tabler. "Lights Out: By targeting Syria's energy sector, the United States can hit President Bashar al-Assad where it really hurts - his pocketbook." *Foreign Policy* (July 19, 2011).

countries on nuclear nonproliferation, such as Japan and the US, will encounter a point where they will need to change the tone and dynamics of this issue.

Nuclear Nonproliferation, Issue, and Agenda

As noted earlier, Japan and the United States have expressed a common interest in nuclear nonproliferation in the 2+2 final document produced in 2011. The statement they made was, at its core, an attempt to reaffirm both of their commitments to nuclear nonproliferation, since both are already a member of most of the existing nonproliferation treaty and regimes, with CTBT as a major exception. In principle, they agree on the agenda of nuclear nonproliferation, but differ in some respects. For example, Japan is relatively tough against North Korea's nuclear development, and demands complete dismantlement of their nuclear weapons before entering into negotiations. However, from Japan's perspective, the United States takes a more flexible and realistic approach on this issue, taking North Korea's nuclear weapon program as a given in the regional strategic setting. In this sense, Japan seems to be more naïve than the US with regards to nuclear nonproliferation¹⁸. In the Iranian case, Japan's involvement toward Iranian nuclear development was more reactive than proactive when compared to the US and EU's involvement in the issue¹⁹.

Despite their differences, however, consensus between both countries is met on the direction and goals towards which nuclear nonproliferation should be heading. What is more significant in dealing with nuclear nonproliferation for both Japan and the US is the ability to adapt their bilateral cooperation in a changing global context.

Generally speaking, the focus of the agenda of nuclear nonproliferation shifted correspondingly with the change of the strategic environment surrounding nuclear weapons. It will continue to do so. Currently, however, the focus of nuclear nonproliferation is not about reducing the number of nuclear weapon states and those with the intention to add a nuclear arsenal to its military depot, but controlling the proliferation of material capability that may contribute to their nuclear possession in the future. In this regard, we are dealing with a latent possibility, rather than an actual and imminent security concern.

Indeed, under the less adversarial international settings that have characterized state relations in recent years, the risk of potential nuclear proliferation is increasing. Presidents Bush and Obama both correctly pointed out that the major threat to the international community is the possible convergence of a terrorist network and WMD capabilities²⁰. This threat has not vanished. A window of opportunity still exists for a terrorist network to utilize the existing supply chain through front companies and by falsified documentation in order to obtain WMD. In this regard, the nexus itself become less visible, while the supply push and demand pull of nuclear material and technology is increasing. It is a perfect recipe

18 Hyeong-Jung Park. "The North Korea's Nuclear Test and US's North Korea Policy." Brookings Online Series (October 2006). <http://www.brookings.edu/views/articles/fellows/park20061026.pdf>; Min Cho. "Denuclearization and the Establishment of a System for Peace in the Korean Peninsula." *KINU Insight*. No. 1 (June 2007).

19 "Japan-Iran Relations in the Spotlight as UN Sanctions Against the Iranian Regime Approach." <http://www.realite-eu.org/site/apps/nlnet/content3.aspx?c=9dJBLNkGiF&b=2315291&ct=8133579>; Nassrine Azimi. "Japan's Iran Moment." *New York Times* (February 17, 2011).

20 See National Security Strategy Report of 2002 and Obama's Prague speech in April 2009.

for erosion of nonproliferation norms and measures. Within this context, a demand pull trend is leading a supply push in shaping the issue and agenda on nuclear nonproliferation.

First, prompted by “green energy” politics since late the 1990’s, the “nuclear renaissance” has turned public awareness towards the use of nuclear energy for reducing the effects of greenhouse gases, thus revitalizing nuclear power plant construction worldwide. To overcome the shadow of the Chernobyl nuclear power plant accident in 1986 and Three Mile Island nuclear accident, international society has raised awareness on how nuclear technologies developed after these incidents²¹. The renaissance stands on the conviction that nuclear power plants are safer than ever, and could sustain the demand for green and clean energy to substitute fossil fuel energy. Greenhouse gas emission was held responsible for global warming, and given the expiration of the Kyoto Protocol in 2012, the facilitators of the COPs had to show the international community that a world less dependent on fossil fuels can still sustain economic development.

In addition, the continuing economic development of newly industrialized countries such as BRICS (Brazil, Russia, India, and China) put additional stress on the global energy supply. The price of crude oil per barrel rose to historic heights in 2009, maintaining its upward trend while keeping the price under control at this moment. The Fukushima nuclear accident did slow the process, but did not change the overall direction of this trend. It’s impossible to know how long this situation will persist, but the level of nuclear safety technology clearly gave confidence to countries concerned with proceeding with the original plan of nuclear development. In the mid-to-longer term, other developing countries may require additional sources of energy for their economic activities. Thus, diversifying energy supply may become crucial. Under this situation, a nuclear power plant becomes an attractive option.

Second, issues of energy independence—or less dependence on oil—have become a more widespread concern.²² The United States has started to rethink its own energy security and turned to decreasing its reliance on the oil supply from the Middle East. There is growing concern among policymakers that over-reliance on Middle Eastern oil decreases their policy flexibility, especially on issues related to the Middle East²³. Even during the “Arab Spring,” the United States had to apply a double standard that favors pro-Western oil producing states, while at least temporarily suspending their efforts to promote democracy. In fact, this approach of reducing oil reliance has been attempted several times during the past century with little success. Especially since the Bush administration, the US government has restarted this effort by attempting to increase utilization of nuclear energy for power generating purposes, and renewable energy for multi-purposes.

The Fukushima accident, at least in the initial stage, changed the nature of the discussion on energy diversity in Japan. The momentum was provoked by a speech by former prime

21 The United States has frozen new construction of nuclear power plants since TMI, but has upgraded maintenance and enhanced technologies for radiation protection to prevent accidents from taking place. John G. Kemeny. *Report of The President’s Commission on the Accident at Three Mile Island: The Need for Change: The Legacy of TMI* (October 1979).

22 The Energy Independence and Security Act (EISA) of 2007 (Public Law 110-140).

23 Ariel Cohen. “Reducing US Dependence on Middle Eastern Oil.” The Heritage Institution. Backgrounder, No.1926 (April 7, 2007).

minister Naoto Kan on July 15, 2010, which announced an intention to decrease Japan's reliance on nuclear energy for its overall energy supply. Kan's point was to neutralize DPJ's Basic Energy Program issued in 2009 that stated their plan to increase Japan's reliance on nuclear energy to 53 percent and instead gradually move toward "a world without nuclear reactors." The DPJ redrafted the Basic Energy Program in 2011, but without any set of concrete goals or numbers regarding nuclear energy dependence.

Kan's announcement excited anti-nuclear civil society groups, and they hoped Japan would refrain from engaging in the business of building NPPs overseas. On the contrary, even Kan and his successor did not suspend their plan to build a nuclear power plant in Vietnam, nor retreat from bidding for contracts in Turkey, where Japan competed with South Korea. It was argued that Japan's seismic technology surpasses any possible nuclear energy competitor. Without it, the possibility existed of nuclear safety regulations in a potential importing country not satisfying the IAEA. In other words, Japan's technology held the key to both global nuclear safety and the nuclear renaissance, though the conflicting interest between safety and security does intervene.

Third, the nature of the threat of nuclear proliferation has changed, and the implications of this change are immense. The new problem is the disparity between state and non-state actors. The potential threat of a violent non-state actor is that they are not affected by nuclear deterrence. However, those groups can make WMD threats to the international order by simply using it as blackmail. Thus, the military balance between allies versus enemy cannot come under traditionally rational calculation, since single use of a nuclear device can achieve their objective. Some would argue that the effects of globalization prevent us from returning to the polarized political structure that characterized the international system during the Cold War.

Except for North Korea and Iran, who already pose a nuclear threat to the international community, the current threat is the latent possibility of proliferation of dangerous weapons and related materials to unspecified actors, possibly including international terrorism networks and religious and ethnic fundamentalists. The latency of the threat meant that states lean more toward maximizing economic benefits rather than security with regard to preventing proliferation. States may try to maximize their exports, thus gaining economic interest and they might hesitate to sacrifice it for a security interest. Reversing this trend requires a visible and shocking event, reawakening the general public to the issue. In this regard, Obama's Prague speech gave the international community a positive shock, as no one believed that "a world without nuclear weapons" would become a feature of the US agenda, not to speak of the global agenda, since this approach to those threats are very different from previous administrations²⁴.

Because of these factors, the issue of nuclear nonproliferation became more technical rather than strategic, if not political. In dealing with nonproliferation, meeting the irreconcilable demands of various communities such as security, environment, economy, nuclear

24 It should be noted that Obama himself does not deny effective nuclear deterrence and exercising extended nuclear deterrence to allied countries. Left vulnerable, those may seek a nuclear option for security reasons. See debates about this logic, Jacques E.C. Hymans. "Veto Players, Nuclear Energy, and Nonproliferation: Domestic Institutional Barriers to a Japanese Bomb." *International Security*. Vol. 36, No. 2 (Fall 2011). pp. 154–189.

industry, arms control, and disarmament is a complex and never-ending task. With those communities trying to utilize the existing measures of nonproliferation for their own benefit, the political and systematic collaboration among the stakeholders in the nonproliferation village becomes crucial.

Collaboration on Nuclear Nonproliferation

Collaboration among the villages under current condition of nuclear nonproliferation is essential for effective implementation of nonproliferation measures. Cooperation and coordination are both crucial, but the prospect of success seems to be low since there exists conflicting demands from different villages. For example, placing the signing and adhering to an IAEA Additional Protocol as a conditionality on peaceful nuclear cooperation agreement was blocked by some countries at the IAEA General meeting in 2011. Other countries such as Australia unilaterally place it as conditionality for nuclear cooperation, but the measure did not become part of the universally applied formula²⁵. When the economic benefit outweighs the less visible security benefit, universalization of the policy measure on nonproliferation is easily sacrificed.

Prior to the Fukushima accident, there was a strong consensus in the international arena about pursuing the peaceful use of the nuclear option as an energy alternative to alleviate environmental concerns. In this regard, while safeguarding nuclear security was the pressing concern for most, growing pressure from nuclear industries was paramount. It is sequentially evident that the nuclear renaissance would increase the risk of nuclear proliferation. It was also a logical path for all states concerned that placing a tight security circle around core technologies and materials while facilitating the shipment of items related to peaceful use of nuclear energy is crucially important, but conflicting for both activities. Striking a balance between economic, social, and technological interest and latent security concerns is a challenging part of this phenomenon, simply because those technologies may become a future security concern while fulfilling the current demand of international society.

The way to strike this balance was to make the issue more technical. Helped by the existing global consensus on the importance of nuclear nonproliferation, states went further into focusing on the technical feature of nuclear proliferation so as to convince the public and themselves that the issue is under control. Indeed, the increasing technicality of nuclear nonproliferation policy and measures does not have negative implications. The problem came from the simple fact that as complexities rise, so does the increase in the number of actors involved, as well as technical sophistications required to prevent dangerous proliferation.

It is true, however, that under these conditions the ability to manage nuclear nonproliferation clearly becomes more difficult. Acknowledging that fact by establishing a multi-layered structure of policy measures would contribute to strengthening nonproliferation as a result. It contributes to preventing second-tier proliferation as well. Second-tier proliferation is an

25 Masahiko Asada. "The Treaty on the Non-Proliferation of Nuclear Weapons and the Universalization of the Additional Protocol." *Journal of Conflict and Security Law*. Vol. 16, No.1 (2011), pp.3-34.

intentional and/or unintentional transfer of WMD related material and technologies by the recipient of peaceful nuclear cooperation to less developed and potentially rogue states²⁶. Given the nature of the technology diversion, multiplying the preventive measures were crucial for nonproliferation.

Japan and United States are not without conflicting interests. Japan puts a stronger emphasis on the NPT. The NPT divides states into two groups: nuclear weapon states or non-nuclear weapon states. Each state has different obligations: nuclear disarmament for the former, and giving up the right to possess nuclear weapons for the latter. The latter have the privilege of receiving peaceful nuclear development, and negative security assurance in return. However, the DPRK and Iran acquired nuclear technology while under the NPT framework and fled from the regime, seeking to have their own nuclear weapons program. Therefore, a framework for nonproliferation under the NPT regime is not sufficient to block these developments.

Indeed, the DPRK and Iranian challenges shows the fragile nature of the NPT regime. Even though the regime requires states to accept IAEA safeguards and inspection, the IAEA has no sanctioning authority to punish willful violators. In this regard, the international community needs an enforcement mechanism to punish violators, and to deter future deterioration of the existing mechanism.

The most appropriate body for these functions is the United Nations, since nuclear nonproliferation is on the global security agenda. President Obama chaired the UNSC in September 2010 and adopted Resolution 1887, which called for states with nuclear weapons to continue disarming, to ratify a ban on testing them, and to agree to a treaty stopping the production of fissile material. In return, the non-nuclear weapon states should accept stronger safeguards designed to stop the spread of nuclear weapons.²⁷ The adoption of the resolution itself is a historic achievement for the international community. The Nuclear Security Summit, which was held in February 2010, pushed the nuclear safety issue further into the international agenda.

In fact, the United Nations had made significant developments in nuclear nonproliferation before the arrival of President Obama and UNSCR 1887. For example, the UN Security Council adopted Resolution 1540 in 2004. UNSCR 1540 calls on states to submit a country report of their domestic administrative measures for the export control of WMD-related materials and technologies to non-state actors. Furthermore, the UNSC imposed strong sanctions against the DPRK and Iran. The DPRK faced especially severe sanctions for its repeated nuclear tests and missile launch, which it calls a satellite launch.

The DPRK's case shows both the success and failure of the UN sanction system. The UN imposed economic sanctions against the DPRK in 2006. The UNSC adopted resolution 1695²⁸. The resolution states that it "condemns the multiple launches by the DPRK of

26 See, Gaurav Kampani. "Second-Tier Proliferation: The Case of Pakistan and North Korea." *The Nonproliferation Review* (Fall/Winter, 2002). pp.107-116; Chaim Braun and Christopher Chyba. "Proliferation Rings: New Challenges to the Nuclear Nonproliferation Regime." *International Security*. Vol.29, Issue 2 (Fall 2004). pp.5-49.

27 S/RES/1887 (2009).

28 S/RES/1695 (2006).

ballistic missiles on 5 July 2006 local time,” and “demands that the DPRK suspend all activities related to its ballistic missile program, and in this context re-establish its pre-existing commitments to a moratorium on missile launching.” It also required states to exercise “vigilance and prevent missile and missile-related items, materials, goods, and technology being transferred to DPRK’s missile or WMD program” and imposed financial sanctions as well.

To make this provision a reality, a financial sanction was imposed on 15 entities and one individual who was involved in sanctioned activities. In 2009, upon the DPRK’s missile test, the UNSC imposed Resolution 1718²⁹. It sanctioned the export of certain materials related to WMD development and luxury goods. Again, facing the DPRK’s nuclear test, the UNSC decided that the DPRK’s activities posed a threat to peace and stability as defined under UN Charter Chapter 7, and imposed strict sanctions under UNSCR 1874 to suspend all military-related trade with the DPRK, as well as severe financial sanctions. Furthermore, UNSCR 1874 asked states to inspect cargo to and from the DPRK if there was an acceptable reason to suspect a violation of the UNSCR.

The positive side of these DPRK sanctions is the fact that the international community collectively engaged in economic sanctions based on the same security concerns. Furthermore, as it becomes an international consensus, more countries may contribute to strengthening the sanctions, which often is a key factor for success. In the case of the DPRK sanctions, the scope is wide and the content is focused and convincing. However, the negative side of the sanctions is in its implementation. In general, UN sanctions ask or call upon states to impose them, but administration of the sanctions is left to the state. As a result, holes remain that the DPRK can utilize to break the pressure. The 1874 Committee reported to the UN Secretary General in 2010 about how the DPRK is trying to distort the sanctions.

The DPRK case shows that the UN framework is not enough. To put it frankly, an effective policy measure on nuclear nonproliferation must cover the front- and back-end of nuclear development, with a special focus on supply chain management. The UN sanction framework was too general and comprehensive, since its major goal was to convince DPRK government to change their policy. Therefore, the DPRK could utilize “normal trade” for weapons procurement, and use other distorting tactics to proceed with its development program, including using front companies and false documentation to cover the transactions. In other words, UN sanctions focus on the intent of the targeted countries rather than activities.

Targeting the activities associated with nuclear proliferation is where the collaboration is both possible and necessary. Among many targets, directly intervening in the core of the problem has had a positive outcome. The most successful initiative is the Cooperative Threat Reduction (CTR) program by the United States. The CTR was later incorporated into the G8 Global Partnership and grew into global initiative. The CTR was based on US law in 1992, hosted by Senators Sam Nunn and Richard Lugar with the intent “to secure and dismantle weapons of mass destruction and their associated infrastructure in former

29 S/RES/1718. (2006).

Soviet Union States.³⁰ The CTR funded and provided expertise to the former Soviet Union (including Russia, Ukraine, Georgia, Azerbaijan, Belarus, Uzbekistan, and Kazakhstan) to decommission nuclear, biological, and chemical weapon stockpiles.

The idea of CTR was unique, but the framework is similar to the post-war weapons dismantlement of adversary states. There is a rich history of precedent cases. What was different about the CTR was the cooperative attitude of the former Soviet Union countries, which was hosted by a state that had been an enemy for a half century, and the fact that the program dealt with the most sensitive weapons for their security policy. From the perspective of the US and Western alliance countries, preventing nuclear proliferation from the very source deals with the root cause of the problem. Indeed, after the revelation of the A.Q. Khan proliferation network in 2006, the world found that CTR did work, judging from the fact that the completion of the Pakistani nuclear weapon was helped by the Netherlands and Israel.

The CTR officially developed into the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction at a G8 2002 Summit Meeting in Kananaskis, Canada. The G8 member states pledged to fund individual programs independently for 10 years, then made the program open to like-minded states who agreed on the principle and guidelines. The program includes: the Biological Threat Reduction Program (BTRP), Chemical Weapons Elimination Program, Nuclear Weapons Storage Security Program (NWSS), Strategic Offensive Arms Elimination Program (SOAE), and Weapons of Mass Destruction-Proliferation Prevention Initiative (WMD-PPI).

There is no denying that implementing these programs within the former Soviet countries contributes to nuclear nonproliferation, disarmament, and global strategic stability. Based on their respective national security perspectives, the G8 and like-minded states are engaged in each program. They could also expect economic benefits for their domestic companies, depending on the scheme. However, it is true that dismantling an obsolete and potentially dangerous military weapon is part of the responsibility of recipient countries. However, most recipient countries are not making the pledge to dismantle their obsolete military buildup, or renew the system. Potentially, therefore, opposition to renew the Global Partnership might surface, arguing that it is benefiting recipient countries by allowing them to save their funds for future military expansion.

Indeed, the criticism as such is a classic type of argument, weighing military concerns over economic assistance, and blaming assistance policy as naïve and liberal. The Global Partnership is dealing with a “legacy system” that is not affecting their current policy or future strategic relationship, so there is significant potential to be met with criticism. Given this background, the political dynamics among interests in disarmament, economic development, and strategic consideration tend to define the outcome. In the case of Global Partnership, a strategic relationship between G8 members and former Soviet countries will determine whether to continue this successful framework or to end the program which has lasted for two decades.

30 Richard Lugar and Sam Nunn. “Help Russia Help Us.” *The New York Times* (May 30, 2008).

The other measure that can be taken is to control and manage activities. The idea of supply chain management (SCM) by no means represents the complete change to the comprehensive structure of nuclear nonproliferation. It is based on current efforts, but alters the area of responsibility of each state involved. The phrase SCM is borrowed from the field of commerce. It refers to the “oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer.” Known as the “Just-in-Time” method, the goal of SCM is to reduce the cost of inventory. Within the context of nuclear nonproliferation, SCM tries to manage materials, technologies, and resources necessary for nuclear development from initial production to the end user. It aims to create a comprehensive system of governance for nuclear development through international monitoring and control on the production and shipment of related materials.

Some equate SCM to other methods of international control on nuclear development such as the Baruch Plan. There is also criticism that governments may exercise too much authority over each stage of the flow of nuclear development. Apart from the debate on the level of the government’s involvement over international commerce, nuclear commerce is already under tight control and regulation. SCM may instead function as a facilitator for information gathering and exchange among states regarding production, information (like transmitting orders and status of delivery), and financial flows. However, the enforcement of nuclear nonproliferation in the area of the SCM still must rely on states’ capacities.

The essential part of this mechanism is the upstream and downstream movement of trade data. In practice, the upstream movement of data will be information gathering and the downstream movement will be applying the information where it is relevant. Currently, data is accumulated by relevant authorities, but not shared among the international community. It is true that information gathering is performed by intelligence organizations in most cases, and those agencies generally operate independently from one another. For this reason, the capabilities necessary for implementing SCM should be first limited to a small number of states that have knowledge of civil and military nuclear development. The countries with such knowledge may provide public goods for successful nuclear nonproliferation by engaging in SCM.

Convergence and Divergence of Policy Approaches between Japan and the United States

Japan and the United States have been strong promoters of nuclear nonproliferation, and will continue to be so for the foreseeable future. Strong proponents of nuclear nonproliferation exist in both countries, and there is ample reason to continue and expand existing measures strategically.

In the two-plus-two Joint Statement in June 2011, Japan and the US addressed the problems posed by the increasingly uncertain security environment. Listed among the challenges was “North Korea’s nuclear and missile programs and its provocative behavior.” It stated that “[achieving] the complete, and verifiable denuclearization of North Korea, including its uranium enrichment program, through irreversible steps and, through the Six Party process,” was a major goal.

Among other objectives in the Joint Statement, both countries listed the following: “Seek the peace and security of a world without nuclear weapons, while maintaining necessary deterrence. Promote the nonproliferation and reduction of weapons of mass destruction and their means of delivery, and hold states accountable for violating their non-proliferation obligations.” In regard to the approach both Japan and the US would take regarding Iranian nuclear development, the Joint Statement affirmed that “as part of the dual-track approach, the United States and Japan will continue robust implementation of UN Security Council Resolutions.” The reason why the Global Partnership did not appear in the statement is not clear at this moment.

Judging from this document, North Korean nuclear development will continue to be deemed a major security concern, but without any new tangible development. The North Korean nuclear development issue is a regular feature of bilateral strategic documents such as this one, and given the stalemate of the Six Party Talks, practical measures to deal with this issue remain intact. It means that as long as the current stalemate continues, the UN sanctions are the single most important way to deal with this two-decade problem.

When it comes to the issue of nuclear nonproliferation, Japan places a great deal of emphasis on the NPT and its political process when compared to the United States. The NPT signatories succeeded in adopting the Final Document at the Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in May 2010, and created an action plan agenda with which to pursue concrete measures towards the implementation of the conference’s conclusions and recommendations. In order to promote the action plan, Japan and Australia formed a group of 10 countries at UNGA in September 2010, and named it the “Nonproliferation and Disarmament Initiative (NPDI).”

The NPDI member states are non-nuclear weapon member states of the NPT, and have close cooperation with United States in terms of security policy. In April 2011, the NPDI states held a second meeting in Berlin, and decided the facilitating states on nonproliferation and disarmament issues: FMCT(Germany); Reporting form of Nuclear Weapon States (Japan, Australia); IAEA Additional Protocol (UAE); CTBT (undecided); Disarmament and Nonproliferation Education (Japan); NWFZ (Mexico); Middle East Conference (Turkey); and Export Control (Canada). The NPDI is maintaining close cooperation with the P5 countries, but is trying to be vocal and influential in the NPT processes.

Japan is an active promoter of the NPDI. However, Japan must also be sensitive to its security environment. The NPT-centered approach on nuclear nonproliferation and disarmament policy has several risks. Japan has decided that they will not be a source of nuclear proliferation, and are very willing to be beneficiaries of US nuclear extended deterrence. Indeed, Japanese pursuit of the nuclear option is blocked by several factors. The US nuclear extended deterrence is one major factor that gives Japan confidence in its own security, and affords Japan the luxury of going without nuclear weapons. More importantly, Japan self-restricts its nuclear ambition based on the grand bargain of the NPT that the peaceful use of nuclear energy is an undeniable right of the non-nuclear weapon states. Therefore, if it moves toward having a nuclear weapon of its own like North Korea and Iran, there is grave concern that it would be barred from nuclear energy cooperation with existing nuclear weapon states, including the United States.

Therefore, Japan-US nuclear nonproliferation cooperation must continue to be implemented without harming the credible US commitment to Japan's security concerns. For this reason, the US maintains the position that they "[are] not prepared at the present time to adopt a universal policy that deterring nuclear attack on the United States, its allies and partners is the 'sole purpose' of nuclear weapons." While that does not please the disarmament community in Japan, the security community welcomes the statement.

At the international level, both governments agreed on the early entry into force of the Comprehensive Test Ban Treaty and the immediate commencement and earliest possible conclusion of negotiations on a FMCT. Furthermore, they agree on revitalizing the Conference on Disarmament (CD). However, the entry of the CTBT into force is blocked by several factors, the most significant of which comes from the US Senate. The concerns held by the US Senate regarding ratification are reasonable, and even US ratification does not necessarily pave the way for the CTBT to enter into force. However, this lack of ratification is becoming a symbol of the stalemate in the issue, and Japan is caught in a difficult position. Regarding the FMCT, the opinions of Japan and the US diverge significantly when it comes to the choice of which path to take should Pakistan continue to refuse to negotiate.

These cases indicate that nuclear nonproliferation at the multilateral level is promoted in a coordinated manner, but at a bilateral level the Japan-US collaborative effort still has room for improvement. In particular, the Global Partnership should be renewed and expanded, and information exchange on SCM promoted. The collaboration should be implemented in a way that nuclear nonproliferation does not adversely affect the interests of other agendas. In this regard, the goal of nuclear nonproliferation should be considered in conjunction with other agendas, but prioritized based on the policy needs of that particular moment. In so doing, the different villages must coordinate their priorities with rational consideration of the national interests of each country.

The Way Forward

Yuki Tatsumi

This volume has examined different elements of nuclear policy in the United States and Japan: non- (and counter-) proliferation/disarmament, deterrence, and civil nuclear energy. Each chapter examined how Tokyo and Washington can better cooperate in each of these areas given the altered nature of security concerns that nuclear power—in both its military and civilian applications—presents in today’s environment, and what the potential obstacles may be.

The biggest challenge for the United States and Japan is *integration*—how to integrate different elements into one coherent nuclear policy, so that they can approach the nuclear issue more holistically. As chapter one discussed, the individual elements of nuclear policy have been managed in a stove-piped and uncoordinated manner. Very little cross-referencing among chapters two, three, and four is an indication of such compartmentalization. A nascent effort has been made to better connect the “nuclear nonproliferation and disarmament village” and the “national security village” in the context of how to balance short- to mid-term priorities of maintaining effective deterrence with the long-term policy objectives of nuclear disarmament since President Obama’s 2009 Prague speech. However, the two countries continue to face challenges in how to better connect these two policy areas, both within their own countries as well as bilaterally.

To this end, it is essential that the discrete groups of stakeholders that constitute the “policy villages,” as examined in each chapter, are better connected. In this context, how to better connect security policy villages and the civil nuclear energy cooperation village is one of the important yet under-explored areas. As chapter three extensively discussed, civil nuclear energy cooperation was never completely insulated from national security policy considerations, but national security policy experts rarely discuss how developments in civil nuclear energy cooperation might affect the security environment. Despite the fact that energy security has emerged recently as one of the most urgent non-traditional security issues since 2001, traditional security policy experts rarely engage in dialogue with the experts in civil nuclear energy. However, as recent waves of civil nuclear cooperation agreements suggest, access to nuclear technology can be a viable tool in advancing one’s strategic interests or diplomatic objectives, such as forging a close relationship with a counterpart government. As such, civil nuclear energy cooperation may increasingly become a part of a country’s national security strategy. Therefore, it is in the interest of national security policy experts to engage the stakeholders in the civil nuclear energy sector in their discourse.

The challenge here is that the stakeholders in the civil nuclear energy policy village do not have a common (or even shared) attitude toward engaging with national security policy experts. For instance, commercial stakeholders in the civil nuclear energy policy village at

least recognize the importance of engaging with national security policy experts because nuclear commercial deals cannot move forward without the blessing of the stakeholders in the national security policy village. Efforts by the national security policy sector to ensure that the nuclear technology remains in the hands of legitimate entities can often frustrate commercial stakeholders. Their frustration originates in the reality that, while they recognize the necessity for safeguarding nuclear technology for national security considerations, their international competitiveness is affected because of the absence of a unified standard for nonproliferation oversight among countries. The companies whose governments have robust sets of nonproliferation safeguard regulations on technology transfer are less competitive internationally, because they compete against companies that do not have the same level of regulation imposed on them by their government. Meanwhile, experts in nuclear energy research and development (R&D) may not see much need or value in engaging with national security experts. Nuclear R&D experts in the United States may be more open to such an engagement because of synergetic budgetary benefits. But Japanese experts in civil nuclear R&D may be hesitant to engage with national policy experts because, given the sensitivities toward the possibility of Japan acquiring its own nuclear weapon capability, the separation between civil nuclear and military/defense has been crucial for the viability of a nuclear energy program in Japan. While it is critical to engage the civil nuclear energy policy village in the national security discussion, doing so in a way that is considered meaningful to the different stakeholders in that village is a challenging task.

The connectivity with the international development assistance policy village is another important, yet under explored, area. As touched upon in the introduction and chapter one, the spread of interest in nuclear power generation technologies is elevating the relevance of the international development assistance policy village, which includes the US Agency for International Development (USAID) and the Japan International Cooperation Agency (JICA). For instance, as examined in chapter one, by facilitating institutional capacity like regulatory capacity, emergency response, atomic law, and human resources as well as fostering nuclear security norms, the experts in the international development assistance policy village may assume a critical role. Given the increasing significance of the international development assistance policy village in nuclear policy, their participation in the discussion of nuclear nonproliferation is long overdue.

In order to address the nuclear issue more holistically as the United States and Japan move forward, there should be a re-examination of who should be represented in the discussion. Of course, the lead role in such a discussion depends on the topic. However, as the security/non-security divide in the nuclear issue becomes less distinct, and the activities in one policy village impact the developments in other policy villages, all the stakeholders should somehow be represented in the discussion.

Secondly, as the United States and Japan work to integrate their respective nuclear policies, *prioritization* emerges as a considerable challenge. While the United States and Japan share many goals (i.e., nuclear-weapon-free world, maintenance of effective deterrence, prevention of illegitimate transfer of nuclear materials and its technology), they often differ on prioritization. As discussed in the introduction, such a gap exists partly because the United States is the world's most dominant nuclear power, whereas Japan is one of the

world's top advocates for nuclear disarmament. Divergence in priorities also occurs due to different roles played by the United States and Japan in today's global security environment. Given the difference in their geographical location, history, military strength, and the role they have played in the evolution of nuclear challenges, it is probably impossible for Washington and Tokyo to perfectly align their policy priorities. Even so, as the world's most dominant nuclear power and the most prominent example of how a country that is technologically capable of becoming a nuclear power can instead be the strongest advocate for nuclear disarmament, the United States and Japan must manage the divergence in their policy priorities to the best of their abilities.

Finally, *implementation* presents a significant challenge if the United States and Japan are to have a real impact on the developments in various aspects of nuclear policy. For instance, although the United States and Japan now hold a regular, twice-a-year dialogue on extended deterrence, whether the two countries can jointly take concrete steps to further enhance the deterrence depends on whether some of the other issues in the US-Japan alliance management can be addressed. Although the June 2011 Security Consultative Committee (SCC) issued a list of issues in which the United States and Japan will closely cooperate, the implementation of such cooperation remains uncertain, considering that the past agreements have often failed to be carried through sufficiently, as mentioned in chapter two.

Furthermore, the long-term impact of the accident at Fukushima Dai-ichi Nuclear Power Station looms large for the future of US-Japan cooperation in nuclear policy. It is fair to say that the Great Eastern Japan Earthquake, of which the Fukushima Dai-ichi Nuclear Power Station accident was a part, triggered many things. Some stakeholders took positive lessons away from the experience. For instance, the Japan Self-Defense Forces (JSDF) took away "lessons learned" from its overall experience in cooperating with the US military in *Operation Tomodachi*. As challenging as it may have been, JSDF's role in containing the damage at the power station in the aftermath of the accident also taught forward-looking lessons to the JSDF. Others' experiences and take-aways are not as positive, however. The Fukushima accident triggered a number of questions on how the government should be equipped to respond to nuclear emergencies. The accident at Fukushima showcased to the world that regardless of the cause, the consequences of nuclear emergencies are dire. And the discussion did not stop there. The accident also triggered public debate over the safety of nuclear energy technologies, leading many people beyond Japan to question the wisdom of relying on nuclear power as an energy source. It also revitalized the anti-nuclear movements by activist groups.

The Fukushima accident will no doubt have a lasting impact on the future of US-Japan cooperation in nuclear policy. Take civilian nuclear energy cooperation, for example. Although Japan has passed the initial phase of being overwhelmed by emotional calls for abandoning *all* of its commercial nuclear reactors, Tokyo can still severely diminish the role of nuclear energy in the long run. Should that happen, it would inevitably lead to the decline of the Japanese nuclear power industry. How would the decline of the Japanese domestic nuclear power industry affect Japan's existing bilateral industrial cooperation in this area, particularly with the United States? How would the change in nuclear related economic relations with the United States manifest itself in the government-to-government

relationship? Would the diminished role of Japan as a US partner in civil nuclear energy cooperation affect Japan's relations with the United States in other elements of nuclear policy? There are more questions than answers at this point.

One potential area of future US-Japan cooperation closely linked to the ultimate fate of Fukushima Dai-ichi Nuclear Power Station will have considerable implications. In the aftermath of the Three Mile Island accident, the US Department of Energy launched a large-scale R&D project that entailed post-accident reactor condition analyses, decommissioning, and decontamination. Japan also will likely invest considerable resources into similar efforts in the near future. If the decommissioning and decontamination efforts lead to technological advancement in these areas, it could serve as a new opportunity for US-Japan cooperation. Nuclear safety can serve as another area for future US-Japan cooperation. For instance, then-Minister in charge of the nuclear crisis Goshi Hosono announced a plan to establish an International Institute for Nuclear Safety Training (*kokusai genshiryoku anzen kenshu-jo*).¹ The United States and Japan can closely cooperate on how to develop the proposed institute so that the lessons learned from the Fukushima accident response can be widely shared with the international community. The United States and Japan should leverage these possible new opportunities to facilitate integration of their respective nuclear policies.

The risk of continued stove-piping exists, particularly in Japan. For instance, the Japanese government decided that it would establish the Nuclear Safety Agency (*genshiryoku anzen-cho*) on August 15, 2011. Tokyo announced its detailed plan—including that the proposed Nuclear Safety Agency will be attached to the Ministry of Environment, not the Ministry of Economy, Trade, and Industry as some suspected—on December 20, 2011.² This means that, at least in the Japanese context, the Ministry of Environment joins the list of government stakeholders in nuclear issues. While it is too premature to gauge how the new agency is structured, it could further complicate inter-agency coordination on the civilian nuclear energy issue alone, let alone overall coordination of nuclear policy. Particularly salient in Japan, the issue of how to enable MOD participation in nuclear issues other than narrowly defined nuclear extended deterrence continues to be a challenge as well. Given MOD's participation in responding to the accidents in Fukushima Dai-ichi Nuclear Power Plant, crisis management (including damage control) in nuclear accidents may serve as a possible area for inter-agency coordination.

The nature of the nuclear challenge the world faces today, however, does not allow the elements of nuclear policy to be managed within separate policy villages. Nuclear issues impact both security- and non-security sectors, with competing interests among them. Going forward, the United States and Japan are best advised to approach the nuclear issue holistically. In doing so, the two governments, separately and together, should make efforts

1 “Hosono Genpatsu-sho: Kokusai Genshiryoku Anzen Kenshu-in no setsuritu wo hyomei” (Minister in charge of the nuclear crisis Hosono announced the establishment of International Institute for Nuclear Safety Training). *Bloomberg News* (September 16, 2011). <http://www.bloomberg.co.jp/news/123-LRLRZU6K50XV01.html>.

2 “Genshiryoku Anzen Cho: Yosan 500 oku-yen kibo” (Nuclear Energy Safety Agency: Its budget approximately 50 billion yen). *Mainichi Shimbun* (December 20, 2011). <http://mainichi.jp/select/seiji/news/20111221k0000m010069000c.html>.

to connect the various policy villages that so far have operated in isolation. Only then will it become possible for the two countries to seek a balanced approach that takes account of the importance of nuclear disarmament, as well as the significance of addressing more immediate security concerns.

About the Contributors

Brian Finlay is Senior Associate and the director of Stimson's Managing Across Boundaries program, which looks for innovative government responses and smart public-private partnerships to mitigate transnational security threats and ameliorate development challenges. Prior to joining Stimson in January 2005, he worked as executive director of a lobbying and media campaign focused on counterterrorism issues, a senior researcher at the Brookings Institution, and a program officer at the Century Foundation. Mr. Finlay was a project manager for the Laboratory Center for Disease Control/Health Canada, and worked with the Department of Foreign Affairs and International Trade. Mr. Finlay has authored and co-authored numerous books, monographs, and reports, and is widely published in academic and policy journals and magazines. Mr. Finlay holds an MA from the Norman Patterson School of International Affairs at Carleton University, a graduate diploma from the School of Advanced International Studies, Johns Hopkins University, and an honors BA from the University of Western Ontario.

Taku Ishikawa is Associate Professor at National Defense Academy of Japan. He is also a member of the board of directors and Chair of the Reviews Subcommittee of the Japan Association for International Security. Previously, he worked at Toyo Eiwa University in Yokohama from 1998 to 2009, and served as a research fellow at the Research Institute for Peace and Security (RIPS) from 1996 to 1998. He received a BA from Sophia University in 1992, a MA from the George Washington University in 1994, and a Ph.D. from Hitotsubashi University in 1998.

Jane Nakano is a fellow in the CSIS Energy and National Security Program. Her research interests include energy security and climate change in Asia, nuclear energy, shale gas, rare earth metals, and energy and technology. Prior to joining CSIS in 2010, she was with the US Department of Energy (DOE) and served as the lead staff on US energy engagements with China and Japan. Ms. Nakano was responsible for coordinating DOE program engagements in the US-China Strategic Economic Dialogue, US-China Energy Policy Dialogue, and US-Japan Energy Dialogue. She also worked on US energy engagements with Indonesia, North Korea, and the Asia-Pacific Economic Cooperation. From 2001 to 2002, she served at the US embassy in Tokyo as a special assistant to the energy attaché. Ms. Nakano holds a bachelor's degree from Georgetown University's School of Foreign Service and a master's degree from Columbia University's School of International and Public Affairs. She is fluent in English and Japanese.

Heigo Sato is a Professor at Institute for World Studies (IWS), Takushoku University since April 2006. Dr. Sato was Senior Research Fellow at the National Institute for Defense Studies (NIDS) before coming to IWS. He joined NIDS in 1993 as Research Fellow. He was a Special Adviser to Foreign Minister Katsuya Okada on disarmament and nonproliferation. He earned his Ph.D. in International Relations from Hitotsubashi University. He received

his MA in Area Studies (United States) from University of Tsukuba and Political Science from George Washington University (Fulbright Scholarship). His research interest includes International Relations, American Politics & Diplomacy, Security Studies (Traditional and Non-traditional), Arms Control and Nonproliferation.

Yuki Tatsumi is Senior Associate of the East Asia Program at the Stimson Center. Previously, she worked at the Center for Strategic and International Studies (CSIS) (2001-2004), Stimson Center (2000-2001), and Embassy of Japan in Washington, DC (1996-1999). She is an editor of *North Korea: Challenge for the US-Japan Alliance* (Stimson, 2011), co-author of *Global Security Watch: Japan* (Praeger, 2010), an author of *Japan's National Security Policy Infrastructure: Can Tokyo Meet Washington's Expectation?* (Stimson, 2008), as well as editor/contributor of several publications on the US-Japan alliance. She is also a recipient of the 2009 Yasuhiro Nakasone Incentive Award. A native of Tokyo, Ms. Tatsumi holds a BA in liberal arts from the International Christian University in Tokyo, Japan, and an MA in international economics and Asian studies from the Paul H. Nitze School of Advanced International Studies (SAIS) at Johns Hopkins University in Washington, DC.

