The Future of Nonproliferation in a Changed and Changing Security Environment: A Workshop Summary

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Introduction

The Center for Global Security Research and Global Security Principal Directorate at Lawrence Livermore National Laboratory convened a workshop in July 2016 to consider "The Future of Nonproliferation in a Changed and Changing Security Environment." We took a broad view of nonproliferation, encompassing not just the treaty regime but also arms control, threat reduction, counter-proliferation, and countering nuclear terrorism. We gathered a group of approximately 60 experts from the technical, academic, political, defense and think tank communities and asked them what—and how much—can reasonably be accomplished in each of these areas in the 5 to 10 years ahead. Discussion was on a not-for-attribution basis.

This document provides a summary of key insights and lessons-learned and is provided to help stimulate broader public discussion of these issues. It is a collection of ideas as informally discussed and debated among a group of experts. The ideas reported here are the personal views of individual experts and should not be attributed to Lawrence Livermore National Laboratory.

A companion paper, prepared by Will Tobey, is also available. Tobey contributed wrap-up remarks to the workshop, which he agreed to put on the record. He took a particularly creative approach to summarizing lessons learned in the workshop, invoking the vernacular of a stock broker: in each of the portfolio areas above, he asked whether the United States should "buy" (that is, invest new resources in future capabilities), "sell" (that is, invest less), or "hold" (that is, maintain the current level of effort). As he put in the general conclusion of our discussion, effective portfolio management requires us to hold in most areas but sell in one while buying in another. See https://cgsr.llnl.gov/thrust/reduce_strategic_dangers

The Nonproliferation Regime 20 Years After NPT Extension

Three general questions were posed to the participants regarding the nonproliferation regime 20 years after the indefinite extension of the Nuclear Nonproliferation Treaty (NPT): Have the last 20 years of NPT implementation strengthened nonproliferation and improved its long-term prospects? Do recent developments affect those prospects? and Do new technologies have an impact? As a general matter, the tone of the group was quite pessimistic. Many see the prospects for the regime as bleak. There was considerable discussion about the mismatch between the issues raised in disarmament diplomacy with the new challenges of deterrence, assurance, and strategic stability. Also, the current tensions between the United States and Russia have spilled-over into the NPT process.

A major concern facing the regime is the apparent growing divide between Nuclear Weapons States (NWS) and Non Nuclear Weapons States (NNWS). This divide is evident in the conflicting priorities voiced during the Review Conference process. The NWS maintain that the pivotal

concerns are terrorism, deterrence and proliferation while the NNWS have turned their focus towards disarmament (the humanitarian consequences movement and its effort to ban nuclear weapons). The Non Aligned Movement (NAM) remains divided and unreceptive to the interests of the NWS. A major milestone looms in 2020: the 50th anniversary of the treaty and the 25th anniversary indefinite extension. It will also be the 75th anniversary of the bombings of Hiroshima and Nagasaki. The United States will face critical decisions about how to promote the long-term viability of the regime and how to weather the political challenges on the road to 2020.

It is important therefore to note that there is some good news for the regime even as it faces many new challenges. In the effort to arrest the acquisition of nuclear weapon capability in Iran, the Joint Comprehensive Plan of Action (JCPOA) addresses a most pressing proliferation concern; of course, whether the problem has been solved or simply postponed will remain an open question for at least another 15 years. Though Iran and North Korea will continue to be trying cases over the next several years, there do not seem to be more countries seeking to acquire nuclear weapons. Other positive outcomes are the almost universal adoption of the Additional Protocol, the increase in the number of Nuclear Weapons Free Zones, and expansion of international education in nonproliferation and disarmament. A continuing program in nonproliferation education could potentially create stronger bonds between Russia and the United States.

The nonproliferation regime comprises more than the NPT but it is the established foundation upon which other elements have been added, such as U.N. Security Council Resolution 1540, the Nuclear Suppliers Group and the Nuclear Security Summit process. If there were to be an attempt to renegotiate the NPT today, there might be a much weaker agreement, so preserving this global norm is important. The increasing focus on disarmament in nonproliferation forums threatens to undermine the effectiveness of the nonproliferation elements. The U.S. needs to be a leader in these debates and to help focus international attention on a step-by-step approach on reducing nuclear risks.

In sum, 20 years after indefinite NPT extension, the nonproliferation regime faces a number of major challenges political and technical challenges that seem only to be growing. The anniversaries of 2020 promise to sharpen national and international debate about whether and how to sustain the regime. And the politics of nuclear disarmament seem likely to continue to detract the needed political attention to the problem of nuclear proliferation.

The Future of Arms Control

Participants were asked to consider the future of arms control. In particular, the prospects for a New START follow-on agreement and/or new multilateral arms control initiatives; whether strengthened technical capabilities can aid in verification; and the implications for monitoring & verification in the event of a collapse of the treaty regime. Following the tone of the NPT regime discussion, the consensus was that arms control progress will remain stalled for the

foreseeable future, due to the poor U.S.- Russia relations. Russian foreign policy appears to be driven mainly by domestic policies and nationalism, which limit meaningful progress. A particularly difficult obstacle is resolving Russian noncompliance with the INF Treaty.

The extension of New START is the likely next "advancement" in the arms control portfolio. The overwhelming consensus was that an extension is advisable, however, determination of the best time to pursue extension requires further analysis. Some contend that now is the time to begin considering the level of uncertainty with future U.S.-Russia relations, however, Russia might push for caveats that the United States would not be willing to accept. Others think that waiting for the political environment to improve would more likely ensure an equitable agreement but the risk further deterioration of relations might result in a much tougher political climate.

No feasible multilateral opportunities to pursue new initiatives were identified. However, there was agreement that whether or not there are treaty negotiations underway, continued R&D on possible verification mechanisms and technologies should be sustained. Greater interest in non-nuclear weapons states and "citizen science" participation in verification regimes could add technical and security obstacles to achieving effective verification. Future efforts will need methodologies for integrating open source information into monitoring and verification while maintaining confidence in the result.

Although no significant progress can be envisioned in the near-term, the general conclusion is that the U.S. should prepare for future policy decisions by analyzing possible options for new treaties or initiatives. Domestic R&D can continue to prepare the ground for future verification regimes and multilateral initiatives on verification technology provide opportunities for international cooperation and assurance.

Threat Reduction Beyond CTR

In recent years, the focus of Cooperative Threat Reduction (CTR) program has shifted from nonproliferation to counter-proliferation. Participants were asked to consider: What could be learned from recent efforts to expand CTR-like approaches to additional countries and to non-nuclear problems? Are there opportunities to continue to strengthen protection against weapons/materials smuggled from Russia without Russian cooperation? Are there new technologies that can improve monitoring and detection? Are there new opportunities to partner with other nations to develop those technologies?

CTR relied on heavily on flexibility and interagency cooperation to achieve its goals. Over time, the increasing institutionalization limited the program's ability to change with a changing world. Although there remain many unsolved problems little opportunity for U.S.- Russia engagement exist, the original Soviet-centric focus has moved to other countries. Today, the Defense Threat Reduction Agency's (DTRA) implementation of CTR concentrates on bio threats, border security and maritime security. It strives to maintain the relationships that are a key to the future of the

program by fostering exchanges on best practices, cooperative development of technology, and training. Budget challenges threaten the loss of capability and readiness, although the group speculated that in an era of shrinking budgets, the Department of Defense will likely maintain funding to the potential detriment of DOS and NNSA nonproliferation programs.

A couple of priority areas that should be preserved are: Radiation Detection - Despite impressive technological developments, two key challenges that persist are detecting signal from shielded material and search & detection in complex environments. Readiness - Sustainability of an organization that can deploy flexible and adaptive capabilities to support unexpected CTR opportunities, such as those that were needed in Syria, Libya, and for the 2005 Bratislava Initiative to work with Russia on nuclear security. Even absent US-Russia engagement, the capabilities built up during the CTR program should be maintained to respond to unexpected nonproliferation and nuclear security opportunities.

Counterproliferation: Steady as She Goes?

The questions that challenged the workshop in this session were: Is proliferation monitoring becoming more or less tractable? What more can/should be done to prepare for the expected occasional need for prompt action in temporarily semi-permissive environments? How can export monitoring and licensing be better utilized to monitor the "new normal" of wide availability of advanced machine tools and additive manufacturing? What opportunities does the counterproliferation mission shift from STRATCOM to SOCOM present?

The participants generally agreed that in the next 5-10 year horizon, existing capabilities will not be sufficient to counter national security threats. The epicenter for the development of new and emerging technologies is shifting away from the government-funded R&D and shifting to private sector or "crowd sourced" initiatives. Increasingly it is the flow of information that is as important as the spread of technologies. In many cases innovation originates outside the U.S. The resulting loss of control creates unprecedented and rapidly growing challenges for WMD proliferation control regimes. Technologies such as additive manufacturing, nanotechnology, genome editing, and autonomous systems are creating new technological threats.

Trends show that the rapidly evolving environment is resulting in regulatory and security oversight gaps, resulting in a need to invest for improvements in communication, monitoring and control systems. Breaking down stovepipes is crucial if we are to be successful in addressing evolving emerging threats. The U.S. national laboratories can contribute to the counterproliferation mission by serving as intermediaries between government and industry. Multidisciplinary teams could contribute assessments and mitigation strategies with an understanding of intelligence, technology and international engagement, including the social sciences to help predict human behavior.

The shift of the counterproliferation mission from STRATCOM to SOCOM poses unique challenges not previously faced by the regime. Current efforts focus on establishing the new

organization and defining what domestic role SOCOM will play. Despite the willingness to share knowledge, there is a strong tendency to veer towards a stove-piped organizational style that would not be advantageous. To combat this problem and solidify the role of the new command, there is active planning to embed experts into SOCOM units to shake up the current culture of hoarding knowledge and create cross-functional teams.

There was general consensus that greater near-term investment to improve engagement between the USG and industry, deterrence analysis, and increasing the integration of social science methods to improve understanding (and predicting) of terrorist intent would yield great benefit.

Countering Nuclear Terrorism

Although the world has yet to face a serious nuclear terrorist attack, terrorism continues to be a persistent threat. Possible explanations for the threat not being realized are effective prevention, level of difficulty for a non-state actor to acquire a nuclear device, or just plain luck. The participants were asked to address: Is the threat evolving in some significant manner? Is ISIS a game changer? Is the overall level of national effort about right? Can international cooperation be enhanced?

It was agreed that the threat will not disappear and is arguably growing. To adequately plan future levels of national readiness, clear understanding of the evolution of the situation is needed. Maintaining the appropriate level of effort will be influenced by the successful quantification and communication of the risks and successes to domestic and international partners. Sources that could be targeted for the illegal acquisition of weapons-usable materials are growing with the greater number of nuclear power facilities, expanding use of radiological materials in academic and medical facilities, and current nuclear weapons modernization programs. The Islamic State (ISIS) presents greater risk than previous terrorist organizations (e.g. al Qaeda, Aum Shinrikyo, or Chechen militants). ISIS is demonstrably capable of remote inspiration and recruitment and is utilizing new tools and technologies to expand their influence on a global scale. The gap that exists as a result of the loss of the U.S.-Russia CTR cooperation and rise in terrorist abilities could be countered by engagement with allied and partner countries bordering on Russia. This could facilitate future response should a “loss of control event” in Russia needs to be mitigated.

To best combat such tenacious threats, more than technical capability is required. To counter the threats, better understanding of terrorist intent and capability, without overestimating their abilities, is needed. As suggested earlier for counterproliferation, multidisciplinary teams including the social sciences could help understand intent and endeavor to predict human behavior. The cuts and mission realignment experienced by the Intelligence Community has hindered their ability to assess future nuclear threats and capabilities need to be reconstituted to continue to maintain a strong knowledge base and work to foster the effective cooperation between political science and hard sciences.

While working to prevent a nuclear terrorist attack, society must sustain long-term support for training and preparedness. It is essential to engage law enforcement and local response units to train and prepare the local communities for a wide breadth of possible scenarios.

The participants agreed that designing and implementing sustainable system–based approaches should be continued even though there is concern that programs to counter nuclear terrorism will likely face declining resources in the future, even though the threat has potentially grown worse.

Lessons Learned

The final session reviewed main themes and implications for the national policy agenda. As already noted above, Will Tobey's summary, posted separately at this website, provides an interesting catalogue of key insights. Three key questions were addressed in this session.

First, how consequential are the changes in the changed and changing security environment for the nonproliferation effort, broadly defined. In sum, we concluded that they are very consequential. Many in the group argued that we stand at a turning point as significant as the turning point of the early 1990s. Bipolarity and then unipolarity have now given way to contested multipolarity. The ability of the major powers to work together to support the global nonproliferation regime has deteriorated, not least because of increasingly divergent views of the stability and desirability of the U.S.-backed order. Treaty-based approaches remain relevant but their political legitimacy has eroded significantly. A few in the expert group argued that the regime has tried to become too many things to too many different people and that the entire paradigm of multifaceted international cooperation to reduce nuclear dangers is in real danger of collapse; others looked at the history of expanding measures and defended the evolutionary approach as a sign of the regime's adaptiveness and thus strength.

Second, how should the overall national portfolio be re-balanced to ensure that the United States has the needed capabilities in place to support national policy objectives over the next 5-10 years? We were looking for a big new initiative, akin to the shift to threat reduction and stockpile stewardship in the 1990s that drove major changes in the strategy for science and technology in the nuclear complex. We found none. We asked the opposite question as well: should the U.S. divest entirely from one or more elements of the broad portfolio. Some argued that it should but the more broadly held view was that we need to maintain all of the current core competencies while pushing forward new technical solutions on a pragmatic basis across the broad agenda.

Third, what are the right next questions? What issues need to be re-thought from a high policy level as we move into this new era? An initial cut includes the following:

1. What can be done to re-build the political bridge between the nuclear weapon states and non-nuclear weapons states within the NPT framework?
2. What would be the optimum timing to extend the New START Treaty, sooner or later (it expires in 2021 and can be extended once for 5 years by mutual agreement)?
3. What can be done now to maintain the working level relations between the U.S. and Russian technical communities such that there is a foundation for renewed threat reduction cooperation when and if the political climate improves?
4. What is the impact of new technologies on proliferation, verification, and monitoring?
5. What more can be done to address the potential insider nuclear threat at a time when Islamic extremists appear to be making headway in gaining adherents in the West?
6. How should we understand the potential role that nuclear weapons might play if ISIS were to acquire one or more and seek to use them to safeguard its revolution?
7. In countering nuclear terrorism, what additional compensatory measures should be considered given the breakdown in U.S.-Russian relations?
8. Are there rising opportunities to work with allies and partners to strengthen deterrence, as opportunities to work with former adversaries to reduce residual threats decline?

There was also a lot of discussion of whether or not we were at a tipping point. Is the paradigm reflected in the five portfolios, which are evolutionary in nature and attest to the adaptiveness of the regime, now in a position where evolutionary change is no longer possible and a major event might cause the collapse of one or more elements? This seems most plausible in the arms control portfolio—a pathway that may be at an end. It also seems plausible in the nonproliferation regime—expect the wide chasm between nuclear and non-nuclear weapon states to only widen further as the humanitarian movement drives forward to the 2020 NPT review conference and the 50th anniversary of the treaty.