Taking the Long View in a Time of Great Uncertainty

All Things Nuclear

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It seems that the term "nuclear" is present almost daily in one media story or another, whether it relates to the growing concern that the world is closer to a nuclear exchange;[1] or that North Korea has made another advancement in their quest for a nuclear weapons capability;[2] or that Russia has violated the Intermediate Nuclear Forces (INF) Treaty;[3] or that all of the Nuclear Weapons States (NWS) are modernizing their nuclear stockpiles and delivery systems;[4] or that the nuclear power industry continues to be in turmoil;[5] or that the U.S. Senate will change its rules and exercise the "nuclear option" to use a simple majority to achieve its ends.[6]

Indeed, the term "nuclear" is being used almost haphazardly these days by nation states and others, desensitizing the population to that term, and raising the specter that there is a "new generational" perspective being created that does not recognize the destructive power of nuclear weapons, (nor the potential global benefits of nuclear energy). Most importantly, the casual use of the terminology diminishes the respect and awe that "all things nuclear" should have for impacting the future of human existence. Organizations such as the United Nations Institute for Disarmament Research[7] are working to change this perspective, and, for example have recently released a seminal research report examining the impact of the use of nuclear weapons and risks associated with various scenarios.[8] Nevertheless, all of the world's nuclear weapons-possessing states are "modernizing" their nuclear stockpiles and delivery systems, lending credibility to the concerns that use of nuclear weapons in a military conflict is becoming more probable.

This is the new world in which we must operate, however, and the challenge to the *Institute of Nuclear Materials Management*: how can we bring the extraordinary science, technology, and policy knowledge among our membership together to not only better prepare the Institute to engage in such a world, but to hopefully be able to steer a course to the future that is more promising than what it appears to be headed toward right now.

This column is intended to serve as a forum to present and discuss current strategic issues impacting the Institute of Nuclear Materials Management in the furtherance of its mission. The views expressed by the author are not necessarily endorsed by the Institute, but are intended to stimulate and encourage JNMM *readers to actively participate in strategic discussions. Please provide your thoughts and ideas to the Institute's leadership on these and other issues of importance. With your feedback we hope to create an environment of open dialogue, addressing the critical uncertainties that lie ahead for the world, and identify the possible paths to the future based on those uncertainties that can be influenced by the Institute. Jack Jekowski can be contacted at jpjekowski@aol.com.*

Current "Things Nuclear" That are Shaping Our World

International

- **Continuing tensions between the West and Russia.** The Trump Administration has indicated that it will attempt to work with Russia on the many issues that are creating international concerns. However, continuing tensions over the annexation of Crimea, incursions into the Ukraine, violations of the Intermediate Nuclear Forces Treaty with the deployment of new Russian missile systems, and the role of Russia in the Syrian conflict create barriers to the possibility of improving relations. These tensions continue to impact the previous Lab-to-Lab and other scientific and technical interchanges that were the hallmark of the post-Cold War relationships that benefited the Institute's interactions with Russia as well.
- **Escalation of tensions and territorial claims in the East and South China Sea.** The long-standing territorial conflict between China and Japan, as well as other Southeast Asia nations, over islands and sovereignty in the East and South China Sea continues, as tensions have escalated and are now influencing national defense policy in Japan and other states.[9] The Trump Administration's outreach to Taiwan initially upset the long-standing "One-Chi-

na" policy position between the U.S. and China, however, recent diplomatic discussions with respect to the evolving situation in North Korea seems to have alleviated some of these initial disagreements.

- **Iran.** The international community continues to have hope that the negotiated Joint Comprehensive Plan of Action (JCPOA) with Iran will be successful in deterring further development of technologies and Uranium enrichment that could lead to nuclear weapons. Unfortunately, the rhetoric emerging from the Trump Administration continues to threaten that agreement, although other parties to the agreement have expressed strong support for the continued implementation of the JCPOA. This rhetoric reached a crescendo during the president's recent trip to Riyadh, Saudi Arabia, where both he and King Salman identified Iran as a terrorist-supporting state, and the president called for the isolation of Iran and eventual regime change.[10]

  Recent missile tests by Iran have also created additional concern not only with the current U.S. Administration but also within the U.N. National Security Council.
- **North Korea (DPRK).** Rhetoric by North Korea continues to escalate tensions with the new U.S. administration. It is unclear what path the new administration will take, although recent administration statements point to a diplomatic-economic strategy backed by military presence.[11]
- **Nuclear Renaissance.** Although some countries have decided to forgo nuclear power as a result of the Fukushima accident of 2011 (such as Germany and Switzerland),[12] nuclear power construction in and by China, Russia, and India is moving rapidly ahead, including in the Arab states. Technological struggles by Japan at the Fukushima site, however, continue to influence global opinions on the safety and cost of nuclear power, although Japan is slowly moving forward with restarting their closed nuclear plants under a new government regulatory environment, but with mixed support among the general population.[13] Further complicating this situation was the recent Chapter 11 filing for bankruptcy by Westinghouse Electric Company, a wholly-owned subsidiary of Toshiba Corporation.[14] Although potentially only impacting the construction of new AP1000 nuclear reactors in Georgia and South Carolina, Westinghouse has operations in Asia, Europe, the Middle East, and Africa and two AP1000 power plants are in the final stages of completion at the Sanmen and Haiyang sites in China.
- **India-Pakistan Relations.** Tensions between these two nuclear armed nation states rise and fall as both nations continue to strengthen and modernize their strategic weapons systems.
- **Cyber Threat.** The growing threat posed by both state and non-state hackers to infiltrate even the most secure networks has created an alarming vision of the future. This is in the face of the growing reliance of critical infrastructure on remote communications, including those that are associated with nuclear facilities.
- **Nuclear Modernization.** Growing international tensions and security uncertainties continue to drive modernization efforts of all the major nuclear weapons-possessing states, particularly as aging infrastructure, weapons, and delivery systems bring into question their ability to meet deterrent needs. Despite efforts to reduce nuclear stockpiles and the associated danger, these modernization programs, including those of the U.S., might become a harbinger of a new multi-country Cold War.
- **U.S.-European Relations.** The withdrawal of the United Kingdom from the European Union adds a further unknown to the development of Western economic and security collaborations, including issues surrounding its own nuclear weapons deterrent.[15] President Trump's visit to Europe in May has added further tensions, leading to calls in Europe for increasing self-dependency.
- **Long-Term Spent Fuel Storage.** Progress continues internationally with the construction of long-term geological repositories.[16] Many countries will be watching the implementation of these sites to determine the impact this important step in the overall nuclear cycle has both fiscally and politically.

U.S.

- **New U.S. Administration.** The potential impact of new U.S. policy as a result of the election of President Trump has been addressed in recent "Taking the Long View" columns.[17] As the world nervously awaits the "next surprise" or change in national policy, it behooves the Institute to closely monitor this changing envi-

ronment particularly as it pertains to the technical and policy issues associated with the JCPOA; North Korean nuclear ambitions; geologic storage of spent fuel and high-level defense waste; nuclear power; and the nuclear weapons modernization efforts.

- **U.S. Budget Deficit.** The economic malaise that has impacted the global community is reflected in the growing U.S. budget deficit, which is approaching $20 trillion.[18] The economic uncertainties that continue to be exacerbated by global conflicts and the uncertain future of the European Union, add a difficult unknown to the stability not only of the U.S. economy but the world as well.

U.S. Nuclear Security Enterprise

- **WIPP Radiation Incident.** As the WIPP site moves back to operational capability, three years after the accidental release of contamination resulting from a breached storage container, there is a growing optimism that the nation's efforts to permanently dispose of legacy waste are on track, including efforts by the new Administration to restart the work associated with the re-opening of the Yucca Mountain project.
- **Future of the Enterprise.** The future of the Nuclear Security Enterprise is yet to be determined, as National Nuclear Security Administration (NNSA) Administrator Klotz has remained in his position for the Interim. President Trump's nomination for Secretary of Energy, former Texas Governor Rick Perry, has recently expressed support for the U.S. national laboratories and the modernization of the stockpile, as well as for WIPP and other programs. The Implementation Plan recently issued by NNSA in response to Congressional language in the FY2016 National Defense Authorization Act (NDAA)[19] demonstrates that a major change in governance and relationships is about to occur within the Enterprise, as the results of two Congressionally-mandated studies of the Enterprise and the DOE system of national laboratories[20] have created a new wave of recommendations to resolve issues that have grown more significant in the past three decades.

The New 2017-2019 INMM Strategic Planning Initiative and "All Things Nuclear"

In many previous columns we have examined the "externalities" that influence the world that the INMM and its members work in, and speculated upon events that might move the world into very different futures. As the Institute has worked on its new Strategic Plan[21] for the past year, the Executive Committee (EC) has recognized the growing interdependency between the highly technical work that some of our members do in the nuclear disciplines, and the equally important work that some of our other members are engaged in with respect to policy, diplomacy, and international agreements. Under this strategic Goal to create a stronger link between our technical and policy disciplines, the EC established a high-priority objective to "***Identify emerging global security priorities to inform INMM activities***." We certainly have no lack of subjects from which to choose as suggested above – but what are the highest global security priorities that are facing our professions and Institute? And, in this rapidly changing world, what are the issues that may take generational commitments to solve?

To address this question, the INMM Executive Committee (EC) has made a commitment to host a ***Global Security Summit*** during the 2018 INMM Annual Meeting that would engage both technical and policy experts, as well as Institute membership, to synthesize current data, and develop the top priorities for the Institute to address in subsequent years. These would become focus areas for special sessions during the Annual Meetings and serve as a basis to identify potential topics and speakers for plenary sessions.

During the 2017 Annual Meeting in Indian Wells, the Strategic Planning Committee will work with members of the EC, including the Technical Division Chairs to further develop the structure and context for such a Summit.

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Endnotes

1. See the Bulletin of Atomic Scientists "Doomsday Clock" announcement (http://thebulletin.org/sites/default/files/Final%202017%20Clock%20Statement.pdf) which moved the hands this year to two-and-a-half minutes before midnight, citing, among other factors: *"The United States and Russia—which together possess more than 90 percent of the world's nuclear weapons—remained at odds in a variety of theaters, from Syria to Ukraine to the borders of NATO; both countries continued wide-ranging modernizations of their nuclear forces, and serious arms control negotiations were nowhere to be seen. North Korea conducted its fourth and fifth underground nuclear tests and gave every indication it would continue to develop nuclear weapons delivery capabilities. Threats of nuclear warfare hung in the background as Pakistan and India faced each other warily across the Line of Control in Kashmir after militants attacked two Indian army bases."*
2. See http://www.nbcnews.com/news/north-korea/north-korea-new-missile-can-carry-heavy-nuclear-warhead-n759406, "*North Korea: New Missile Can Carry 'Heavy Nuclear Warhead*".
3. See https://www.armscontrol.org/pressroom/2017-02/russia-must-immediately-resolve-inf-treaty-non-compliance-issue, "*Russia Must Immediately Resolve INF Treaty Noncompliance Issue".*
4. See https://www.armscontrol.org/factsheets/USNuclearModernization, "*U.S. Nuclear Modernization Program"*; https://www.sipri.org/media/press-release/2016/global-nuclear-weapons-downsizing-modernizing, "*Global Nuclear Weapons: Downsizing, but Modernizing*"; and https://www.sipri.org/sites/default/files/FS%201606%20WNF_Embargo_Final%20A.pdf, "*Trends in World Nuclear Forces*".
5. See https://www.nytimes.com/2017/03/29/business/westinghouse-toshiba-nuclear-bankruptcy.html?_r=0, "*Westinghouse Files for Bankruptcy, in Blow to Nuclear Power",* for an article on the Westinghouse declaration of bankruptcy, which calls into question the potential success of the U.S. effort to begin re-establishing a nuclear power capability in Georgia and South Carolina.
6. See https://www.nytimes.com/2017/04/06/us/politics/neil-gorsuch-supreme-court-senate.html, "*Senate Republicans Deploy 'Nuclear Option' to Clear Path for Gorsuch".*
7. http://www.unidir.org/
8. See http://www.unidir.org/files/publications/pdfs/understanding-nuclear-weapon-risks-en-676.pdf, "*Understanding Nuclear Weapons Risks*".
9. See http://www.cnn.com/2017/02/07/asia/east-china-sea-senkaku-diaoyu-islands-explainer/, "*East China Sea: How an Uninhabited Island Chain Splits Japan and China*", and http://www.southchinasea.org/
10. See https://www.theatlantic.com/international/archive/2017/05/trump-saudi-speech-islam/527535/, "*Trump's Speech on Iran, Annotated*".
11. See: https://www.washingtonpost.com/world/tillerson-says-all-options-are-on-the-table-when-it-comes-to-north-korea/2017/03/17/e6b3e64e-0a83-11e7-bd19-fd3afa0f7e2a_story.html?utm_term=.d3aa103fb9f6 "*Tillerson says: 'All Options are on the Table' When it Comes to North Korea*".
12. See https://en.wikipedia.org/wiki/Nuclear_power_phase-out, "*Nuclear Power Phase-out*".
13. See http://www.abc.net.au/news/2017-01-05/the-future-of-nuclear-energy-in-japan-after-fukushima/8162686, *"The future of nuclear energy in Japan, nearly six years after the 2011 Fukushima disaster".*
14. See https://www.forbes.com/sites/jamesconca/2017/03/31/westinghouse-bankruptcy-shakes-the-nuclear-world/#5339ed802688, "*Westinghouse Bankruptcy Shakes the Nuclear World*".
15. See: http://truepublica.org.uk/united-kingdom/will-britain-handing-nuclear-deterrent-part-brexit-deal-eu/ *"Will Britain Be Handing Over Its Nuclear Deterrent As Part Of The Brexit Deal with the EU?"*
16. See http://www.nature.com/news/why-finland-now-leads-the-world-in-nuclear-waste-storage-1.18903, "*Why Finland now leads the world in nuclear waste storage*"; http://www.skb.com/our-operations/clab/, which describes Sweden's interim storage effort; and http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-wastes/storage-and-disposal-of-radioactive-wastes.aspx, for a longer

article describing all of the issues and nuances associated with long-term storage.

17. See JNMM Vol. 45 No.2, "*Taking the Long View in a Time of Great Uncertainty: That Will Never Happen – the Power of Scenario Planning*", pp. 36-40; and JNMM Vol. 45 No.3, "*Taking the Long View in a Time of Great Uncertainty: Winds of Change*", pp. 35-37
18. See: http://www.usdebtclock.org/
19. See: https://nnsa.energy.gov/sites/default/files/nnsa/inlinefiles/governance_report_dec._2016_1.pdf
20. See: http://cdn.knoxblogs.com/atomiccity/wp-content/uploads/sites/11/2014/12/Governance.pdf?_ga=1.83182294.1320535883.1415285934, for the Agustine-Mies Report; and https://energy.gov/lab-commission/downloads/final-report-commission-review-effectiveness-national-energy-laboratories for the Glauthier-Cohon report (the "CRENEL" report).
21. See JNMM Vol. 45, No.1, "Taking *the Long View in a Time of Great Uncertainty: Preparing for the Future*", pp. 51-53.