Taking the Long View in a Time of Great Uncertainty

Listening to Our Members and Advancing INMM's Mission in the Midst of Global Turmoil

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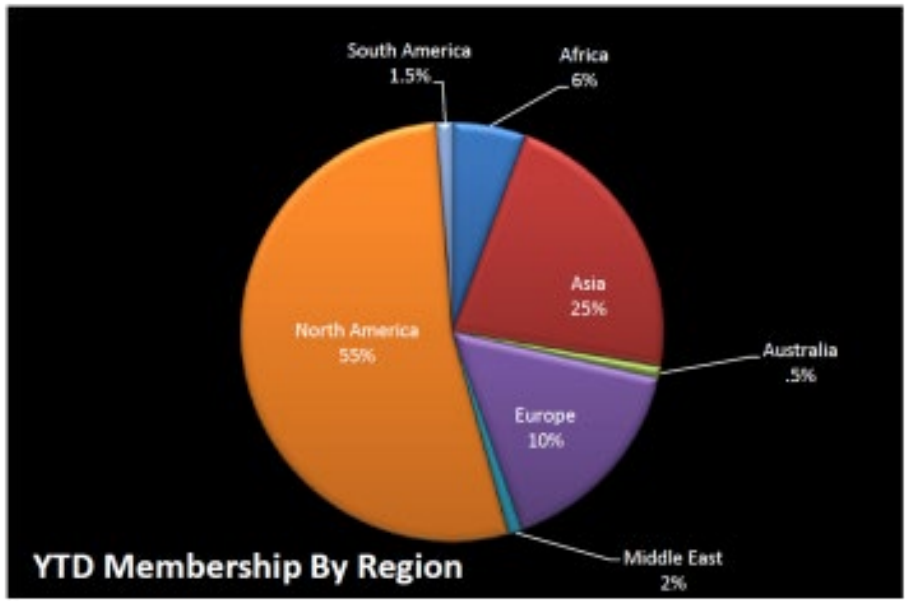
The world and the Institute of Nuclear Materials Management (INMM) are experiencing turmoil on an unprecedented level, with respect not only to "things nuclear" but also many other technological, societal, and political influences that directly or indirectly impact the world that INMM operates in and that our membership finds itself facing every day.[1]

In the closing plenary at the 2018 Annual Meeting, the Institute solicited input from attendees on a number of strategic subjects,[2] stimulated by initial discussions from a panel of experts[3] who also offered their opinions on the topics identified by the Executive Committee (EC) prior to the meeting.[4]

During this past year, the EC has analyzed the information gathered from that closing plenary session and put it into context with the Institute's existing Strategic Plan.[5] As might be expected, the number one issue identified by our membership in each of the strategic subjects discussed can be directly tied to the turmoil that we all see around us every day. This column summarizes the top priority in each strategic subject area discussed at the closing plenary session, demonstrating the breadth of the subject matter expertise in our Institute and the broad interests of our members.[6]



Lack of Political Progress on Nuclear Disarmament

How do we deal with the "new normal" with respect to arms control negotiations (or lack thereof)? With the withdrawal from the Joint Comprehensive Plan of Action by the United States, the abandonment of the Intermediate-Range Nuclear Forces Treaty by both the United States and Russia, and the ambivalence about extending the New Strategic Arms Reduction Treaty, years of work to establish some modicum of nuclear arms control appears to be fading away. Another challenge to the Institute is how we recapture engagement of the Russian chapters and continue to make the work of the Institute relevant and value-added to our other international members. Should we consider holding INMM events or workshops in Europe or Asia to reengage them in the Institute's activities?

The most recent data shows that our membership is now almost equally balanced between U.S. and international membership. This is a historic milestone and requires bold thinking to address the changing demographics of the Institute. Nuclear materials management is indeed a global issue, and INMM members are the experts at the table. So how do we leverage that expertise?

Implementation and Security Practices at Sites

Although physical perimeter security at sensitive nuclear sites, including nuclear power reactor sites, is still a critical issue of concern with policymakers and the public, new technologies such as drones and cybersecurity have captured much of the headlines today.

Some Institute members expressed concerns about "less-attractive" sites such as university research facilities where funding for security may not be adequate to protect against potential threat scenarios. Much work has been done over the past two decades — most recently, during the Obama administration's Nuclear Security Summit years — to reduce the

opportunities for diversion or sabotage by reducing the amounts of nuclear materials and the number of sites worldwide. For the plenary attendees to identify this as the highest challenge, risk, or threat with respect to nuclear security clearly demonstrates that something still is not right.

At one time, the Physical Protection Division (now named the Nuclear Security and Physical Protection Division) was one of the most active INMM technical groups. This was driven in large part by congressional hearings in the United States (such as the Dingle Commission), as Sandia and other national laboratories designed and deployed sophisticated perimeter-intrusion systems and developed techniques such as vulnerability analysis to categorize threats and identify solutions. It was noted that much of the U.S. infrastructure still uses decades-old technologies, some of which failed the simplest of tests, as demonstrated by the 2012 intrusion at the Y-12 National Security Complex. Is it again time for a major technology development program to emerge? Where are the papers at our Annual Meeting proposing such technologies?

Ability to Interfere with Safety Systems at Facilities

All of the responses demonstrated that our membership is concerned about the cyber threat to nuclear facilities and systems, with the highest interest associated with safety issues. The recent action by the EC to create the Cyber/Physical Security Integration Committee reflects an acknowledgment by leadership that a greater focus on this issue needs to occur. The interactive closing plenary a couple of years ago that demonstrated cyber hacking of control equipment highlighted this issue for attendees. Many of the Department of Energy's (DoE) National Nuclear Security Administration laboratories have growing initiatives in this area, and it is important for the Institute to stay current on how they will impact all of the Technical Divisions.

As a result of the growing threat by both state and nonstate actors, the United States has named both space and cyberspace as "warfighting domains," raising the level of importance in the defense posture for both of these new areas. Some literature has suggested that cyberattacks could represent a next-generation weapon of mass destruction,[7] whereas others reflect on language in the U.S. Nuclear Posture Review that nuclear weapons could be used in response to a significant cyberattack.[8] DoE Secretary Rick Perry has launched a new initiative to establish a special cyber program and an Assistant Secretary for Cyber and Infrastructure Protection, and the Pentagon has stood up CYBERCOM as a Unified Combatant Command. A new National Institute of Standards and Technology (NIST) cybersecurity control compliance requirement is now in all Department of Defense (DoD) contracts and subcontracts and will be audited in 2019. Note that the DoD-led initiative to require certification of contractor and subcontractor information technology (IT) systems in alignment with NIST 800-171 Rev.1 is a harbinger of what other national security agencies (such as the DoE) might eventually require. The 100+ security controls required by that standard have the potential to further impact the IT environments that are so critical to the work being done in the Institute's areas of competency.

Connecting Policy and Technical Communities to Develop Solutions

As the Institute has focused more on this issue, a natural path toward better engagement in our Technical Divisions has occurred. The experiment during the upcoming 60th Annual Meeting to have a plenary speaker each day will provide the opportunity for enhancing this linkage, as will efforts to more formally engage with policy organizations from the Nuclear Threat Initiative to Carnegie, as well as international collaborations with organizations such as the European Safeguards Research and Development Association and the World Institute for Nuclear Security.

Artificial Intelligence and Machine Learning

AI and the increasing use of technology in every aspect of our world has captured the imagination of the next generation and created new opportunities and challenges. With the intermingling of hypersonic delivery weapons adopted by Russia and China, the whole landscape of nuclear deterrence may change. Instead of having the luxury of 30 minutes or more to make a decision for a nuclear retaliation launch, leaders may instead be faced with having to make a decision in a matter of minutes — leading to the potential for AI systems to play a larger role.[9]

Outreach to the Nuclear Industry

That this issue was identified as a priority demonstrates why the Facilities Operations Division was formed, and why the EC has developed a fuel cycle graphic that shows how each Technical Division is engaged in activities associated with every aspect of the nuclear fuel cycle. The Institute's low-profile approach to publicly responding to policy issues contributes somewhat to this lack of engagement, but perhaps the marketing expertise of our new management company, Association Headquarters, may be of assistance in addressing this issue.

During the next year, the EC and Strategic Planning Committee will continue to analyze and develop the feedback provided by our membership during the 2018 closing plenary, while evaluating the dramatic changes in our world with respect to the nuclear environment, with the hope of creating a broadly supported set of strategic initiatives that will benefit our membership.

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.*

References

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2. Seven questions were provided to the panelists prior to the closing plenary, with several multiple-choice answers, including "other." The panelists and attendees were then queried for more details. The questions posed were the following: (1) What is the current top global challenge/risk/threat with respect to nuclear proliferation? (2) What is the current top global challenge/risk/threat with respect to nuclear security? (3) Which risk set concerns you more? (4) What are the greatest cyber threats related to nuclear materials management? (5) What are the top three areas INMM should focus on? (6) Which technology has the best chance to become a "game changer" (plus or minus) for INMM? (7) Where should INMM increase its attention?
3. Panelists included Dr. Jacques Baute, director, Division of Information Management, Department of Safeguards, International Atomic Energy Agency; Dr. Bassam Abdullah Khuwaileh, assistant professor, Nuclear Engineering Program, University of Sharjah; Mitsuo Koizumi, manager, Technology Development Promotion Office, Integrated Support Center for Nuclear Nonproliferation and Nuclear Security, Japan Energy Atomic Agency; Sonia Fernández Moreno, planning and evaluation officer, Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials; and Julie Oddou, head of the Committee Technique Euratom, Atomic Energy Commission.
4. Jekowski J. 2018. New challenges for the institute. *Journal of Nuclear Materials Management. 46(4): 61–63.*
5. INMM 2017–2019 strategic plan. INMM. www.inmm.org/About/Strategic-Plan
6. Although only the top issue for each strategic subject area is discussed here, the EC has analyzed the top three issues for each area identified by closing plenary participants to ensure all perspectives are embodied in any adjustments to the Institute's Strategic Plan.
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