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Lessons Learned at the Idaho National Laboratory for the Entry into Force of the U.S. Additional Protocol

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Abstract
For a number of years, the Idaho National Laboratory (INL) has been preparing for the entry into force of the U.S. Additional Protocol (AP). These preparations included attending training, participating in tabletop exercises, preparing draft declarations, developing INL-specific guidance documents, preparing for and hosting a mock complementary access visit, and preparing declarations for official submittal. All of these activities, the training materials, and software developed by other U.S. DOE national laboratories (PNNL, ORNL, LANL, and BNL) were very helpful in preparing for the entry into force of the AP. As with any endeavor of this size and complexity, however, there are always instances where even the best preparations and advanced planning do not anticipate every challenge. As the DOE's lead nuclear energy research and development facility, the INL faced many unique challenges. The majority of research conducted at the INL is nuclear fuel cycle related, most of which is not exempted by the National Security Exclusion. This paper describes the lessons learned from the INL's experience of preparing for the entry into force of the AP, specifically how translating and implementing general principles into actual activities proved to be one of many challenges, and provides general suggestions on how to respond effectively and efficiently to routine annual data calls and other AP requests.

Introduction

The U.S. Additional Protocol (AP) grants the International Atomic Energy Agency (IAEA) additional rights to access 1) information pertaining to civil nuclear activities and 2) the locations where those activities are occurring [1]. The U.S. voluntarily adopted a version of the IAEA's Model Additional Protocol, even though the U.S. is not obligated to do so as a Nuclear Weapons State. By doing so, the U.S. is encouraging other countries to agree to adopt their own version of the IAEA Model AP. With the additional information provided by all participating nations, and the additional access rights provided under the AP, the IAEA will have a significantly improved ability to detect the early stages of clandestine programs that may be developing nuclear weapons, thereby deterring Non-nuclear Weapons States from engaging in such activities.

The Idaho National Laboratory (INL) is a science-based, applied engineering national laboratory within the U.S. Department of Energy (DOE) complex. Our overall mission is to ensure the nation's energy security with safe, competitive, and sustainable energy systems and unique national and homeland security capabilities [2]. As the DOE's lead nuclear energy research, development, demonstration, and deployment (RDD&D) laboratory, our nuclear energy mission is to develop advanced nuclear technologies that provide clean, abundant, affordable, and reliable energy to the U.S. and the world. Given these missions and the correspondingly large amount of advanced nuclear fuel-cycle and reactor RDD&D work the INL conducts, the INL has gained a significant amount of practical, real world experience in working to meet the requirements of the AP. Combined with strong leadership, extensive training, and support provided by DOE's National Nuclear Security Administration (NNSA) Office of International Regimes & Agreements and other

DOE national laboratories, this experience provides the basis for the lessons learned in preparing for the entry into force of the AP described in this paper.

Lessons Learned

1. The AP is new. While the legal requirements of the AP are clear, there are still some uncertainties in the practical implementation of AP. Determining what is declarable is sometimes a matter of expert opinion. For example, a Principal Investigator (PI) may argue that the research he is doing is theoretical and basic science while an AP technical reviewer believes this work is applied research and development (and is therefore declarable). Under certain circumstances, determining when and where AP legal requirements are applicable is still challenging. For example, the AP declaration data calls are based on a specific as-of date[i] for the activities to be declared, but the IAEA may perform open source literature searches to verify the accuracy and completeness of declared activities that may or may not be commensurate with the as-of date.

   Some of the reasons why the practical implementation of AP is still in flux include:
   a. The boundary conditions for all activities to which the AP applies to have not been established in practice.
   b. It is unknown what other entities, both within the U.S. and other nations, are declaring.
   c. There have been few opportunities to get AP-specific feedback from the IAEA and learn what information is helpful to the IAEA in performing their enforcement duties, and what information is not helpful and/or has a negative impact on the interests of the nation making the declaration.

2. Given newness of the AP and its uncertainties, understanding the Articles of the AP and the various ways in which they can be used when interacting with the IAEA is imperative. The AP Articles provide the legal basis for the position that one takes with respect to any AP related interaction with the IAEA. The ways in which interactions with the IAEA may occur include:
   a. Preparing information to be submitted to the IAEA in declaration line items (DLIs).
   b. Providing answers to IAEA requests for additional information (RAI).
   c. Negotiating with the IAEA and answering questions during a Complimentary Access (CA) visit.

3. Despite the fact that the AP Articles are clearly written, there is typically still some room for interpretation. Sometimes it is a person's professional training that colors their interpretation of the AP. For example, lawyers, engineers, and research scientists, are all trained to think in very different ways. While it is recognized that any description of a group will be an oversimplification and stereotypical, lawyers are typically trained in interpreting and applying laws to the facts, to a given situation, or set of circumstances, and to document and defend the decisions that are made. Engineers are typically trained to solve problems by reducing each decision to a simple logic problem. Scientists are usually trained to use the scientific method[ii] to investigate phenomena and acquire knowledge. All of these ways of thinking can affect the interpretation of the AP requirements and the resulting information that is declared to the IAEA. Similarly, an individual's political ideology can affect how the AP Articles are interpreted. One's political beliefs may prejudice their beliefs about the mission and intent of the IAEA, which can influence their interpretation of the AP, and subsequently how much and what kind

of information they think is reasonable to provide in an AP declaration.

Having different perspectives, however, is beneficial when interpreting AP requirements. As previously stated, understanding the various ways in which the AP Articles can be used is imperative when interacting with the IAEA. Providing information to the IAEA that helps their ability to detect clandestine activities, but at the same does not reveal information that harms a nation's interests is not something that only one person or one perspective can do both efficiently and effectively.

4. Fulfilling the legal requirements of AP at a DOE national lab is a complex process.
   a. Successfully providing the required information to the IAEA involves addressing the following "people" issues:
      i. Raising awareness and educating others about what AP is, its importance, and its requirements. Given that the AP is relatively new, many people do not know what it is, and therefore do not know the AP requirements.
      ii. Getting the highest possible levels of laboratory management to support and the AP teams (i.e., AP development, technical, and security review teams) and empower them to respond to AP declaration data calls, RAIs, and CA visits.
      iii. Getting PIs to cooperate and provide the required information requested by the AP teams without concern of disclosing important project information that may give away their competitive advantage.
      iv. Coordinating effectively the efforts involving the DOE NNSA, DOE field office, AP teams, laboratory management, PIs, physical security, OPSEC, counterintelligence, export control, and foreign national visitor approval. Efficient and successful responses to AP requests require effective coordination of all groups mentioned above, especially during a CA visit.

   In short, the AP process requires the education, support, cooperation, involvement and coordination of a number of people.

   b. Successfully providing the required information to the IAEA also involves providing the "right" level (i.e., not too little or too much) and type (i.e., content) of information to the IAEA.
      i. Using the laboratory's financial or project management tracking system as the first filter for identifying declarable activities is very helpful, but projects are not always represented or described in the financial management system the same way they are understood scientifically. Furthermore, the financial management system is only a snapshot in time.
      ii. As previously mentioned, having people with different perspectives improves the likelihood that the "right" information is reported to the IAEA.
      iii. It is important to document all relevant research collaborations, especially those with foreign nations and universities.
      iv. The IAEA will often review open source material as a means to discover what nuclear research and development activities have occurred or are occurring. It is important to know what information is publicly available in the event the IAEA has questions about it.

v. Having a well-written security plan and following Managed Access best practices are essential because they are the last lines of protection in the event of a CA visit. Maps provided to the IAEA need to be drawn with enough precision such that only the area where the declarable activity is occurring is open for inspection. All other areas need to be marked "off limits". Performing a pre-IAEA CA visit walk down and getting detailed input from PIs and facility managers helps improve the precision.

5. The process of AP entering into force has taken years. Thus, knowledge management, including effective ways to transfer knowledge and experience to others is important. Record keeping year to year is also critical, especially on decisions regarding what is declarable and what is not.

Conclusion

In preparing for the entry into force of the AP, a number of important insights and lessons have been learned at the INL. Central to many of the lessons learned is the fact that the AP is new, and while the legal requirements are reasonably clear, many specific details of its implementation are still uncertain. As opportunities to learn from constructive feedback occur, many of these uncertainties will likely be clarified. Nevertheless, regardless of what aspects of AP implementation become clearer over time, successfully responding to AP related requests for information will still require effectively managing your work control processes and your human capital.

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[i] An as-of date means that only declarable activities that are currently occurring as of a specific date should be declared.

[ii] Scientific method: the collection of data through observation and experimentation, and the formulation and testing of hypotheses. (Merriam-Webster Dictionary)

References

1. INFCIRC/288/Add.1, "Protocol Additional to the Agreement between the United States of America and the International Atomic Energy Agency for the Application of Safeguards in the United States of America," International Atomic Energy Agency, 2009.
2. INL/EXT-08-13048, "Strategic Plan: 2009-2018," Idaho National Laboratory, 2008.