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MC&A POLICY ISSUES FOR INTERNATIONAL INSPECTIONS AT DOE NUCLEAR FACILITIES

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ABSTRACT

Recent initiatives and executive decisions within the US have included an offer to place certain special nuclear materials from the former weapons stockpile under international safeguards inspections. The nuclear materials at issue are excess materials; other materials characterized as strategic reserve will not be subject to these international activities. Current Department of Energy requirements and procedures to account for and control these nuclear materials may need to be modified to accommodate these inspections. Safeguards issues, such as physical inventory frequency and verification requirements, may arise from the collateral safeguards activities in support of both domestic and international safeguards. This paper will discuss Office of Safeguards and Security policy and views on these international inspection activities at former nuclear weapons facilities, including implications for current domestic safeguards approaches currently implemented at these facilities.

DISCUSSION

In September 1993, the President of the United States made an offer before the United Nations General Assembly to ban the production of special nuclear materials for weapons purposes or outside of international safeguards. This offer also will place fissile nuclear materials declared as excess to the nation's strategic needs under International Atomic Energy Agency (IAEA or Agency) inspection. The implications of this offer will impact the operations of Department of Energy (DOE) facilities and the safeguards and security measures employed in the protection of their materials. However, this does not imply that placing such materials under international inspection is undesirable. Instead, the importance of the successful completion of this action requires careful consideration of the elements of inspection to be concluded between the United States and the IAEA. The purpose is not to compromise legitimate national security, operational, and health and safety concerns within the DOE. The overall importance of these inspections to the nonproliferation goals of the US should outweigh any inconvenience caused by the intrusiveness of the inspection activities. Inspector access and protection of sensitive information are concerns not only associated with IAEA inspections but with bilateral inspections and reciprocal visits pursuant to arms control and treaty verification protocols. However, this paper will only deal with IAEA inspections.

The domestic safeguards and security program is structured to prevent the theft or diversion or both of nuclear materials from threats originating inside or outside the facility. The international inspection regime is similarly concerned, but the inspections are structured to assure that nuclear materials are not diverted by the state or facility for weapons production. Goals and approaches that satisfy both domestic and international safeguards are generally the same. These include establishing quantities

of nuclear material in specified material balance locations and providing assurance that these nuclear materials are in stated quantities in their specified locations. The objectives are accomplished through the use of materials accountability and materials control measures.

International inspection compliance drivers are the establishment of nuclear material inventories and verification that these inventories are not introduced into an undeclared weapons program. Domestic programs are driven by costs and resource considerations as well as national and domestic policy issues related to threats and protection of weapons designs and related security information. Both programs have specified requirements that must be met to reach a level of comfort that is acceptable to all parties involved. Although each driver may have an initial basis in associated costs, the safeguards goals and approaches must be balanced to ensure that national and international security and nonproliferation interests are met. These methods must also permit the inspection parties to achieve their safeguards objectives without forming obstacles to the inspection activities and the acquisition of related information.

Decisions regarding the safeguards objectives are often directed by system planning, design, and application of resources and technology. Experience can be critical in the success of the international inspection mission by helping identify appropriate goals. The application of safeguards by DOE on materials that were at one time included in the weapons or production programs is no different than safeguards on other types of materials found in the nuclear fuel cycle employed in energy production. Although the success of the safeguards mission is the goal, the higher ideals are preventing proliferation of nuclear weapons, reducing associated risks of sabotage, and helping other nuclear states implement international safeguards programs. Safeguards programs must include all aspects of each goal in its measure of success. Ultimately the effect of the domestic program must be seen for its contribution to international safeguards programs.

The implementation of domestic safeguards programs, whether for weapons production programs or dismantled weapons and excess materials, must comply with existing inspection requirements. These requirements can be used to reach specific conclusions as to the status of the materials and success of the safeguards program. Additionally, national security and proprietary information should not be compromised. International inspection activities will demonstrate the commitment by the US in encouraging weapons dismantlement and reconversion activities aimed at reducing nuclear weapons arsenals. This properly balanced approach to domestic and international safeguards within the US will serve as a model to other nuclear weapons states to encourage their commitment for international inspections of their fissile materials.

The creation of the IAEA was considered to be a world solution to emerging nuclear fuel cycle problems. Its goal was to promote the peaceful use and development of nuclear materials worldwide while supporting nuclear safety and protection of the environment and people. The agreements of the member states with the IAEA empowered the states to have uninhibited access to civilian nuclear facilities for the Agency to perform its duties. However, weapons materials were not covered in these agreements between the IAEA and states declared to be nuclear weapons states. The recent offer by the US to place excess fissile materials under the IAEA's inspection regime provides a challenge to the intent and conditions contained in existing safeguards agreements with respect to facility access and protection of sensitive and proprietary information. Recent safeguards policy changes in the DOE

complex have occurred as a result of mission and programmatic needs and especially from the perceived end of the Cold War. The Department is emphasizing cost-saving and efficiency measures without significantly increasing risk. Long-term storage procedures implemented through recent Departmental guidance may result in high-density storage facilities that are not frequently accessed for domestic physical inventory verification procedures. Such storage methods may result in increased radiation exposures to the Agency inspectors as they attempt to verify the presence of the nuclear materials. Relying upon technology rather than labor intensive methods should decrease worker and inspector exposure. This recent Departmental guidance has been issued concerning increasing the duration between inventories by relying upon access control and monitoring, nuclear material physical attribute monitoring, and reduced personnel access. This guidance is designed to take advantage of many protection systems already employed at facilities. Such techniques provide the means to support domestic and international inspection with assurance that the information provided indicates the actual materials in storage. However, acceptance of these methods by the inspecting agency must be negotiated as these initiatives and new guidance are not consistent with traditional IAEA safeguards methods. The potential problem is that these new physical inventory approaches may not support the timeliness goals and permit the levels of hands-on access routinely required by the Agency. However, the indicated levels of access by the IAEA may compromise extended physical inventory periods used by the Department to minimize operational and health and safety impacts associated with conducting safeguards. The primary issue from one inventory to the next is the maintenance of this historical knowledge trail concerning the materials in inventory. The IAEA emphasizes the use of containment and surveillance techniques to provide a continuity-of-knowledge of inventories between verification periods. The use of highly reliable, redundant, and independent containment and materials control systems in Departmental facilities may enhance this continuity and address the physical inventory frequency and access issues mentioned above. Lastly, intrusive inspections that involve large numbers of verification samples, frequent access, or extended inspector periods in storage locations may significantly impact the facility's receipt of materials from recovery operations.

Another important issue not specifically a materials control and accounting concern is related to protecting sensitive physical security information during inspector access. Long-term storage locations, such as vaults that possess Category I quantities of special nuclear material, are equipped with sensors and other systems to detect unauthorized access and activities in these storage locations. The performance of these physical security systems, such as their detection and assessment capabilities as well as their specific locations, is sensitive and can only be released on a "need to know" basis. Shrouding the location of these systems and using alternative (non-technical) physical security measures during IAEA inspector access are likely solutions to this issue.

Fundamental principles of domestic and international safeguards are used to establish declared quantities of fissile nuclear materials and to periodically verify those quantities by conducting physical inventories. Performing some verification measurements, or variable tests, on these nuclear materials may potentially reveal sensitive or proprietary information concerning the configuration or makeup of an item containing nuclear materials. Although this may not be an issue with domestic safeguards implementation for nuclear materials in weapon forms, such items cannot be inspected by

uncleared personnel unless the protection of sensitive information can be assured. Inspection of such items could be addressed using personnel from existing nuclear weapons states; however, neither the US nor the IAEA may view such compliance as politically acceptable. No acceptable methods are currently available to permit the inspection of weapons or components or both by uncleared personnel. Therefore, to permit the inspection of nuclear materials declared excess to the strategic needs of the US, weapons and components must be segregated from the materials obligated under international inspection requirements. Of course, excess weapons components could be processed into a non-sensitive composition and form to permit international inspection.

In conclusion, extending IAEA safeguards to former DOE weapons facilities and to fissile nuclear materials excess to our national deterrent force presents many technical and political issues. These issues should not deter such inspections but should encourage the facilities to implement new methods and technologies that support the DOE requirements, build confidence, and support overall nonproliferation benefits of the international inspections. However, it is important to ensure that placing such nuclear materials under safeguards and allowing international inspectors into former weapons facilities do not undermine the ultimate goal of international safeguards. Supportive measures must be implemented into facility planning and procedures to complement and strengthen the respective safeguards programs and support both national needs and global nuclear nonproliferation.