

## **POLICY ISSUE INFORMATION**

July 28, 2000

SECY-00-0163

FOR: The Commissioners

FROM: William D. Travers  
Executive Director for Operations

SUBJECT: SUMMARY OF INTERNATIONAL SAFEGUARDS ACTIVITIES  
PERFORMED BY THE OFFICE OF NUCLEAR MATERIAL SAFETY AND  
SAFEGUARDS

### PURPOSE:

To provide the Commission with an overview of international safeguards activities within the Office of Nuclear Material Safety and Safeguards (NMSS); to respond to the Commission's request for information about staff efforts to strengthen international safeguards; to inform the Commission about the execution of the Interagency Agreement with the Department of Energy to provide material protection, control, and accounting support to regulatory agencies in the Former Soviet Union; and to prepare for the August 2000 Commission briefing on international activities.

### SUMMARY:

The "International Nuclear Safety Support Strategic Arena" of the NRC's draft Fiscal Year 2000-2005 Strategic Plan specifies that a strategic goal of the NRC is to "Support U.S. interests in the safe and secure use of nuclear materials and in nuclear nonproliferation." This paper provides an overview of international safeguards activities performed to accomplish this goal. NMSS international safeguards activities are performed to meet NRC's obligations under U.S. statutes, treaties, and international agreements. NMSS exercises its nuclear nonproliferation support responsibilities through safeguards and nonproliferation assistance and export licensing support activities. These activities strengthen the nonproliferation regime, by enhancing its

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capability to deter actions by a country that might seek to violate its Nuclear Nonproliferation Treaty and Safeguards Agreement commitments. NMSS international safeguards activities also support enhancement of protection, control, and accounting of nuclear materials through voluntary information exchange and technical assistance to help safeguard nuclear material.

#### BACKGROUND:

The international nuclear safety strategic goal of the NRC's draft Fiscal Year 2000-2005 Strategic Plan is as follows: "Support U.S. interests in the safe and secure use of nuclear materials and in nuclear nonproliferation."

Policy oversight of the international nuclear safety support activities is the responsibility of the Office of International Programs (OIP); however, specific technical responsibilities are divided among OIP and the other NRC offices. The OIP retains the lead responsibility for international agreements, export licensing, and nuclear regulatory support. NMSS has the lead responsibility for implementing the U.S.-IAEA safeguards agreement, reviewing the capability of countries to effectively safeguard exported U.S. nuclear materials and technology, and providing technical support to strengthen the capability of the IAEA and other countries to effectively implement their safeguards responsibilities. Because of its responsibilities to license and inspect the nuclear fuel cycle facilities, NMSS contains the NRC's resident expertise in nuclear material safeguards and implements the safeguards agreement at the licensee facilities through license amendments. In addition, at the Commission's direction NMSS has initiated a review of the use of a design basis threat (DBT) in foreign countries for the design of physical protection systems. To the extent possible this effort will identify those countries that do employ a DBT, how it is used, what adversary characteristics are addressed, and what conclusions can be derived regarding the current NRC DBT.

The need for this paper was recognized during preparations for the Commission briefing of May 1999 on international nuclear safety support activities. The completion of the paper was deferred to place the international safeguards activities in the strategic framework developed through Planning, Budgeting, and Performance Measurement process recommendations provided to the Commission in March 2000.

#### DISCUSSION:

This paper provides an overview of international safeguards activities in support of each measure. The dominant statutory authorities, including treaties and international agreements with which the NRC must comply or support U.S. Government compliance are listed in Attachment 1. Because the international activities are closely linked to statutes and international agreements, NMSS activities are conducted in close cooperation with OIP and the Office of General Counsel. Additional information on each of the international safeguards activities is contained in the following attachments to this document:

- "Agreements for Cooperation and Safeguards Agreements" (Attachment 2)
- "Implementation of US-IAEA Agreement" (Attachment 3)
- "Nuclear Materials Management and Safeguards System" (Attachment 4)
- "Strengthening of International Safeguards" (Attachment 5)
- "International Physical Protection Support" (Attachment 6)
- "Former Soviet Union Material Protection Control and Accounting Support Program" (Attachment 7)

- “Highly Enriched Uranium Purchase Contract Transparency” (Attachment 8)
- “Trilateral Verification Initiative” (Attachment 9)

Compliance with statutes and international obligations.

NMSS international safeguards activities are performed to meet NRC’s obligations under U.S. statutes, treaties, and international agreements. Failure to meet these obligations can significantly impair the U.S. Government’s ability to pursue its international interests as a trustworthy participant. The following provides an overview of the obligations and NMSS activities to meet them.

- The Atomic Energy Act specifies that the Commission shall: (a) implement policies contained in international arrangements; and (b) approve licenses for nuclear exports that have been determined not to be inimical to the common defense and security of the U.S. While the NRC’s Office of International Programs has lead responsibility for export licensing, including technology transfers and subsequent arrangements, NMSS supports the 10 CFR Part 110 export licensing reviews through identifying nonproliferation concerns, verifying that International Atomic Energy Agency (IAEA) safeguards would be applied to the materials, and verifying that physical protection programs meeting the international guidance are present to effectively protect U.S.-obligated nuclear materials against theft or diversion.
- Pursuant to the Atomic Energy Act, the U.S. Government has entered into Agreements for Peaceful Nuclear Cooperation with over 20 Countries with which we have nuclear commerce. The agreements for cooperation with States from which the U.S. imports nuclear equipment and materials place obligations on the U.S. that are agreement-specific. Annually NMSS conducts approximately 200 cooperation-agreement compliance actions. These involve, among others, receiving assurances from the licensee facilities that the materials will be handled in accordance with the agreements (e.g., EURATOM, Australia), and the checking and return of tamper-indicating seals to the foreign regulatory authorities.
- The U.S.-IAEA Safeguards Agreement obligates the U.S. to make U.S. facilities without direct national security significance eligible for the application of IAEA safeguards and to facilitate the application of IAEA safeguards. Activities undertaken by NMSS to implement the Safeguards Agreement at NRC-licensed facilities include periodic updating of the “List of U.S. Facilities Eligible for IAEA Safeguards”; facilitating IAEA inspections and visits to licensee facilities (e.g., BWX Technologies); reviewing IAEA proposals for the application of safeguards at licensee facilities; and providing licensee accounting reports and communications to the IAEA.
- To implement U.S. domestic requirements and also to satisfy reporting requirements under the U.S.-IAEA Safeguards Agreement and under the agreements for cooperation with other countries, the U.S. maintains a national system for accounting and control of nuclear materials. A critical component of the U.S. national system is the Nuclear Materials

Management and Safeguards System (NMMSS). NMSS is the NRC's technical project manager for the NMMSS program and the point of contact for licensees with NMMSS data-submission issues. The NRC and the U.S. Department of Energy (DOE) jointly fund the NMMSS.

- The U.S.-Russia Highly Enriched Uranium (HEU) Purchase Agreement and subsequent memoranda of understanding define those activities to be undertaken to assure that the low-enriched uranium (LEU) that the U.S. purchases from Russia is derived from weapons-origin HEU, and that the LEU is not re-enriched in the U.S. to produce HEU for use in weapons. NMSS is responsible for facilitating Russian transparency inspections at U.S. enrichment and fuel fabrication facilities.
- The Joint Statements signed by Presidents Clinton and Yeltsin ["Joint Statement on Nonproliferation of Weapons of Mass Destruction" (1994) and "Joint Statement of Principles" (1998)] commit the U.S. and Russia to parallel plutonium disposition activities. Under the FY 1999 Defense Authorization Act, NMSS is responsible for licensing the mixed-oxide fuel-fabrication plant to be constructed under this program. In addition, NMSS has been working with the DOE to ensure that the Pit Disassembly and Conversion Facility and the plutonium immobilization facility are built and operated in accordance with NRC licensing standards.
- The Nuclear Nonproliferation Act of 1978 commits the U.S. to continue to strengthen the safeguards program of the IAEA, to assist the IAEA in effectively implementing safeguards, and to improve the IAEA safeguards system. The NRC, through NMSS, works with the IAEA and in cooperation with the other U.S. Federal agencies to provide technical expertise, new technologies, and financial support to strengthen the international safeguards system.

#### Prevention of significant proliferation incidents.

Theft and diversion of nuclear material are of particular concern because of the possibility that terrorist groups or rogue nations could use the material to construct a nuclear explosive device. The NRC supports U.S. Government nuclear safeguards and nonproliferation objectives through participation in international activities. NMSS plays a leading or influential role in various international safeguards activities, including improving the efficiency, effectiveness, and realism of the nonproliferation system.

NMSS exercises its nuclear nonproliferation support responsibilities through safeguards and nonproliferation assistance and export licensing support activities. These activities strengthen the nonproliferation regime, by enhancing its capability to deter actions by a country that might seek to violate its Nuclear Nonproliferation Treaty and Safeguards Agreement commitments.

NMSS reviews export license applications, and other requests, to confirm that effective and appropriate IAEA safeguards and physical security programs are in place for U.S.-obligated nuclear materials in the receiving country. Approval of exports from the U.S. is conditional on the assurance that full-scope international safeguards and adequate physical protection programs are in place. NMSS provides a key part of the NRC's reviews to ensure conformance with U.S. nuclear energy and nonproliferation laws, which are intended to ensure that U.S. exports will be controlled, protected, and safeguarded during transit and use in the importing country, and that exports will be used only for peaceful purposes. NMSS reviews are based on information gleaned from multiple sources, including assessments performed by NRC staff

during physical protection and safeguards bilateral trips; from the review of IAEA and other documents; and from participation in IAEA working groups and meetings. NMSS maintains a data base of safeguards-relevant information derived from technical publications, news magazines, foreign publications, and State Department cables for each country to which the U.S. exports nuclear-related materials and technology. Annually, NMSS reviews more than 100 export and import cases. These include 10 CFR Part 810 technology transfers and subsequent arrangements for retransfer of U.S.-origin nuclear materials.

NMSS provides extensive support to strengthening IAEA safeguards and international nonproliferation efforts to assure effective implementation of commitments made in accordance with the provisions of the Treaty on the Nonproliferation of Nuclear Weapons. Activities supporting strengthened international safeguards include: (1) supporting development of effective measures to verify the accuracy and completeness of States' declarations; (2) providing technical expertise directly to the IAEA, and through U.S. Government-coordinated initiatives to strengthen IAEA safeguards; and (3) coordinating the implementation of IAEA safeguards at NRC-licensed facilities to ensure conformance with the terms of the US/IAEA Safeguards Agreement and the effective implementation of verification measures. In addition, a NMSS manager represents the U.S. on the IAEA Director General's Standing Advising Group on Safeguards Implementation (SAGSI). Support is also provided to developing bilateral and international measures for verification of nuclear material stockpile reductions in the U.S. and Russia [i.e., the HEU Transparency verification project and the Trilateral (US-Russia-IAEA) Verification Initiative]. Activities to strengthen international physical protection are discussed in the following section.

NMSS also works with other Federal agencies in cooperative efforts to combat reported nuclear smuggling and black-market sale of nuclear materials. NMSS participates in the interagency group, chaired by the Department of State, that provides a coordinated U.S. government response to illicit trafficking incidents, provides technical support to other Federal law enforcement agencies (e.g., U.S. Customs) on smuggling issues and incidents, and works closely with the Department of Energy in evaluating and assessing reported offers to sell nuclear materials, domestically and internationally.

#### Prevention of significant safeguards events.

NMSS international safeguards activities support enhancement of protection, control, and accounting of nuclear materials through voluntary information exchange and technical assistance to help safeguard nuclear material. Theft and diversion of nuclear material are of particular concern because of the possibility that terrorist groups or rogue nations could use the material to construct a nuclear explosive device.

In support of strengthening physical protection programs in other countries, NMSS participates: (1) with other U.S. Government agencies, and serves periodically as delegation lead, in information-exchange meetings to enhance national physical protection programs in countries possessing U.S.-obligated nuclear materials; and (2) on IAEA International Physical Protection Advisory Service teams. NMSS also participates in and chairs international working group meetings to enhance the IAEA's physical protection guidance document [Information Circular (INFCIRC)/225, Rev.4] and the Convention on Physical Protection (INFCIRC/274). A NMSS manager chaired the working group meeting to enhance the INFCIRC/225 technical guidance document and participated on the working group enhancing the INFCIRC/225 physical protection guidance handbook.

Through fiscal year 1998, NMSS provided assistance to the regulatory authorities in Russia, Ukraine, and Kazakhstan to establish national regulatory systems for nuclear materials protection, control, and accounting and safety, funded through the Cooperative Threat Reduction and Lisbon Initiative programs. Staff informed the Commission of the status of the NRC efforts to obtain funding from DOE for continuing this assistance in SECY-99-068 (dated March 4, 1999) and SECY-99-262 (dated November 5, 1999). On May 15, 2000, DOE provided NRC a signed interagency agreement that will further enhance assistance to the regulatory agencies in these countries to strengthen material protection, control, and accounting. NRC signed the agreement on July 7, 2000, and anticipates commencing work under this agreement in the near future. NMSS has provided assistance by recommending draft regulations, promoting effective licensing and inspection programs, and developing implementing guidance in the three countries through a number of support activities under the Cooperative Threat Reduction and Lisbon programs. The physical protection international exchanges addressed in the preceding paragraph also provide assistance to the other regulatory organizations involved in these exchanges.

NMSS has also supported the training of domestic and foreign individuals on safeguards technology, including the International Training Course on Physical Protection of Nuclear Facilities and Materials and the Nuclear Threat Awareness Course, which are co-hosted by DOE and other agencies.

#### Support to U.S. Government objectives.

The NRC supports U.S. Government nuclear safeguards and nonproliferation objectives through participation in international activities. NMSS plays a leading or influential role in various international safeguards activities, including improving the efficiency, effectiveness, and realism of the nonproliferation system.

To maintain current knowledge on the application of IAEA safeguards and to coordinate international safeguards policy issues, NMSS participates in periodic interagency safeguards bilateral meetings with Japan, Germany, the United Kingdom, France, the European Atomic Energy Commission, and the IAEA. In support of efforts to strengthen IAEA safeguards and to strengthen the implementation of safeguards in other States, NRC staff members exchange information with staff from other States through their participation on IAEA-convened Advisory Groups, Consultants Meetings, Experts Groups, Working Groups, and task committees.

#### RESOURCES:

The Fiscal Year (FY) 2000 and 2001 budgets for international safeguards activities in NMSS provide for full-time equivalents (FTEs) and operating funds that are partitioned as follows:

	NRC Funded				Reimbursable Resource Allocation			
	FY 2000		FY 2001		FY 2000		FY 2001	
	\$K	FTE	\$K	FTE	\$K	FTE	\$K	FTE
International Safeguards Implementation	0	2.0	0	1.0	0	0	0	0
Safeguards Strengthening	25	1.5	25	1.5	0	0	0	0
Bilateral Agreements	0	0.5	0	0.5	0	0	0	0
Export/Import Licensing	0	2	0	2	0	0	0	0
NMMSS (Materials arena budget)	1422	0.4	1422	0.4	0	0	0	0
Former Soviet Union Support	0	0	0	0	165 <sup>1</sup>	2.0 <sup>1</sup>	TBD <sup>1</sup>	2.0 <sup>1</sup>
Plutonium Disposition Support	0	0	0	0	0	1.0	0	1.0
Overhead (Section Chief) <sup>2</sup>	0	1.0	0	1.0	0	0	0	0
Travel	75	0	75	0	0	0	0	0
Total	1522	7.4	1522	6.4	165	3.0	TBD	3.0

These resources have been reviewed and sustained during the staff's FY 2002 budget formulation process, which included the application of the Planning, Budgeting, and Performance Management process.

#### COORDINATION:

This paper has been coordinated with the Offices of International Programs, the Office of General Counsel, and Chief Financial Officer, all of whom have no objections.

**/RA/**

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#### Attachments:

1. "Statutory Authority, Including Treaties and International Agreements, Binding upon NRC for International Safeguards Activities"
2. "Agreements for Cooperation and Safeguards Agreements"
3. "Implementation of US-IAEA Agreement"
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5. "Strengthening of International Safeguards"
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8. "Highly Enriched Uranium Purchase Contract Transparency"
9. "Trilateral Verification Initiative"

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<sup>1</sup>Initial "no-year" funding of \$165,000 was provided by DOE in the May 15, 2000, interagency agreement to cover NRC FTE and tasks. FY2001 funding is expected to be determined by DOE in September 2000.,

<sup>2</sup>Responsible for international and domestic safeguards support activities.

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	FY 2000		FY 2001		FY 2000		FY 2001	
	\$K	FTE	\$K	FTE	\$K	FTE	\$K	FTE
International Safeguards Implementation	0	2.0	0	1.0	0	0	0	0
Safeguards Strengthening	25	1.5	25	1.5	0	0	0	0
Bilateral Agreements	0	0.5	0	0.5	0	0	0	0
Export/Import Licensing	0	2	0	2	0	0	0	0
NMMSS (Materials arena budget)	1422	0.4	1422	0.4	0	0	0	0
Former Soviet Union Support	0	0	0	0	165 <sup>1</sup>	2.0 <sup>1</sup>	TBD <sup>1</sup>	2.0 <sup>1</sup>
Plutonium Disposition Support	0	0	0	0	0	1.0	0	1.0
Overhead (Section Chief) <sup>2</sup>	0	1.0	0	1.0	0	0	0	0
Travel	75	0	75	0	0	0	0	0
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1. Initial "no-Year" funding of \$165,000 was provided by DOE in the May 15, 2000, interagency agreement to cover NRC FTE and tasks. FY2001 funding is expected to be determined by DOE in September 2000.

2. Responsible for international and domestic safeguards support activities.



## **STATUTORY AUTHORITY, INCLUDING TREATIES AND INTERNATIONAL AGREEMENTS, BINDING UPON NRC FOR INTERNATIONAL SAFEGUARDS ACTIVITIES**

### **Statutes and Presidential Directives:**

- "Atomic Energy Act of 1954, as amended"
- "International Atomic Energy Agency Participation Act of 1957" (including the "Statute of the International Atomic Energy Agency")
- "Energy Reorganization Act of 1974, as amended"
- "Nuclear Non-Proliferation Act of 1978"
- "Convention on the Physical Protection of Nuclear Material Implementation Act of 1982"
- "Soviet Nuclear Threat Reduction Act of 1991" (Nunn-Lugar)
- "Presidential Decision Directive/NSC-41: U.S. Policy on Improving Nuclear Material Security in Russia and the Other Independent States" (September 20, 1995)

### **Treaties and International Agreements:**

- "Treaty on the Non-Proliferation of Nuclear Weapons" (Non-Proliferation Treaty)
- "Convention for the Physical Protection of Nuclear Material"
- "Agreement between the United States of America and the International Atomic Energy Agency for the Application of Safeguards in the United States of America" (U.S.-IAEA Safeguards Agreement)
- "Additional Protocols (I and II) to the Treaty for the Prohibition of Nuclear Weapons in Latin America"
- "Additional Protocol to the Treaty of Rarotonga" (Prohibition of Nuclear Weapons in the South Pacific)
- "Joint Statement of Principles between the United States and Russia on Nonproliferation of Weapons of Mass Destruction and Means of Delivery" (1994 and 1998)
- Agreements for Cooperation for the Peaceful Use of Nuclear Material between the U.S. and Argentina, Australia, Bangladesh, Brazil, Bulgaria, Canada, China, Colombia, Czech Republic, Egypt, European Atomic Energy Community, Hungary, Indonesia, International Atomic Energy Agency, Japan, Republic of Korea, Morocco, Norway, Peru, Philippines, Poland, Slovakia, South Africa, American Institute in Taiwan, and Thailand
- Multilateral Safeguards Agreements between the U.S. and IAEA with Chile, India, Jamaica, Mexico, Turkey, and Venezuela
- US-Russia Highly Enriched Uranium Purchase Agreement
- Wassenaar Agreement (international export control agreement)
- Nuclear Suppliers Guidelines (international export control agreement)
- Zangger Committee (international export control agreement)

### **Treaties under Negotiation or Pending Ratification (and Associated Implementing Statutes):**

- Additional Protocol to US-IAEA Safeguards Agreement (signed pending ratification)
- US-IAEA Agreement for the Verification of Excess Weapons Materials (under negotiation)
- Fissile Material Cut-Off Treaty (under negotiation)
- Agreements for Cooperation (under negotiation)
  - Russia
  - Democratic Peoples Republic of Korea
  - Turkey
  - Bangladesh

## **AGREEMENTS FOR COOPERATION AND SAFEGUARDS AGREEMENTS**

Pursuant to the Atomic Energy Act, the U.S. Government negotiates Agreements for Peaceful Nuclear Cooperation with the international trading partners. These agreements are required for exports of nuclear equipment, nuclear material, and nuclear facilities from the U.S. Twenty-four of these agreements are currently in force.

The agreements stipulate that the parties will track nuclear material and non-nuclear items exported pursuant to the agreement. When the other party is a non-nuclear weapon State, the agreement specifies that the U.S.-obligated nuclear materials or facilities into which the U.S. nuclear equipment is received will be subject to International Atomic Energy Agency safeguards. Pursuant to five of these agreements [i.e., European Atomic Energy Commission (EURATOM), Canada, Australia, Japan, and Sweden], under which the U.S. imports nuclear materials or equipment, the U.S. Government has accepted obligations with respect to the imported nuclear materials and to nuclear materials processed with the imported equipment. These obligations require the U.S. Government to track and periodically report on nuclear materials and nuclear-related items subject to the agreements. The Office of Nuclear Material Safety and Safeguards (NMSS) interfaces with the licensees to ensure that these obligations are met. NMSS performs the following functions:

- Providing State Department with assurances that proposed shipments of nuclear material from EURATOM to the U.S. will be received by a facility authorized to do so and that the material will become subject to the US/EURATOM agreement on receipt. This activity is performed approximately 130 times per year.
- Reviewing and processing approximately 50 requests per year from EURATOM for the return of tamper-indicating seals from nuclear material shipments from EURATOM facilities to the U.S.
- Reporting, to the State Department annually, the inventory of nuclear material in licensee facilities subject to the US/Japan Agreement.
- Providing assurances to the Australian government that, on arrival of shipments of Australian uranium concentrates at U.S. ports of entry, the U.S. will assume responsibility for safeguards and physical protection of the material.
- Confirming container numbers and integrity of tamper-indicating seals on Australian materials. Approximately 20 activities related to Australian imports are performed each year.
- Coordinating and participating in the annual safeguards discussions with Australia to discuss agreement implementation activities and reporting issues.
- Preparing input to yearly reports to Australia, Canada, and EURATOM on the quantities of nuclear material in the U.S. subject to these agreements.

In addition to the above efforts, NMSS staff is working with the U.S. Department of Energy to develop and implement a system to simplify the tracking of foreign-obligated nuclear material.

## **IMPLEMENTATION OF US-IAEA AGREEMENT**

The U.S. Government has placed 250 facilities in the U.S. on the list of facilities eligible to be selected by the International Atomic Energy Agency (IAEA) for the application of safeguards; 210 of these facilities are on U.S. Nuclear Regulatory Commission (NRC)-licensee sites. Nine of the eligible facilities are currently selected by the IAEA: four highly enriched uranium (HEU) and plutonium facilities are undergoing safeguards inspections and five NRC-licensee fuel fabricators are reporting material accounting data only. Three of the four inspected facilities are U.S. Department of Energy (DOE) vaults storing plutonium or HEU declared excess to U.S. defense needs. The fourth facility is the HEU downblending facility at an NRC licensee, BWX Technologies, in Lynchburg, Virginia. The U.S. Government currently provides over \$2 million per year to the IAEA, through voluntary contributions, to cover the IAEA's expenses in safeguarding the four selected facilities.

Implementation of the US-IAEA Safeguards Agreement is coordinated by an interagency committee, the Subgroup on IAEA Safeguards in the United States (SISUS). The Office of Nuclear Material Safety and Safeguards (NMSS) chairs this committee, which is further composed of representatives from the DOE, and the Departments of State and Defense. The subgroup is responsible for: undertaking interagency tasking to resolve international safeguards implementation issues; developing interagency action plans for implementing IAEA safeguards in the U.S.; tracking the status of the interagency actions; and coordinating interagency communications, with the IAEA, on international safeguards in the U.S.

NMSS is responsible for the following:

- Assuring that IAEA safeguards measures at NRC-licensee facilities (e.g., BWX Technologies) are effectively implemented, that prescribed information is reported to the IAEA on a timely basis, and that verification measures under development could be effectively applied at licensee facilities with minimal impact on licensee operations.
- Representing U.S. Government and licensee interests in negotiating safeguards agreements and facility attachment documents, serving as the interface between the IAEA Inspectorate and the licensee, and assisting in resolution of potential discrepancies and anomalies resulting from safeguards inspections.
- Developing procedures for implementing new agreements (e.g., the Additional Protocol to the U.S. Safeguards Agreement) at licensee facilities.

### **1. IMPLEMENTATION OF INTERNATIONAL SAFEGUARDS INSPECTIONS**

In late 1994, the U.S. Government arranged for the purchase and shipment of ~560 kilograms (kg) (~1240 pounds) of HEU from Kazakhstan to the U.S. under Project Sapphire. BWX Technologies was contracted to purify and downblend the HEU to ~4 percent enriched uranium. This 4 percent enriched uranium will be shipped to a fuel fabricator, where it will be made into fuel for commercial nuclear power reactors.

To assure Kazakhstan that the HEU would not enter the U.S. weapons program, the U.S. placed the HEU under IAEA safeguards. In 1996, the IAEA began safeguarding the downblending activities. By November 1997, BWX technologies had purified and downblended

~380 kg (~840 pounds) of the HEU obtained from Kazakhstan. Because equipment to safely process the remaining HEU needed to be acquired, the processing of the last ~180 kg (~400 pounds) of HEU was delayed. The final downblending was verified by the IAEA and completed in May 2000.

In 1998, ~50,000 kg (~50 tons) of HEU declared excess to U.S. national security needs began being transferred from DOE facilities to BWX Technologies, to be downblended. This downblending will be performed under a contract between BWX Technologies and the U.S. Enrichment Corporation, which will receive and market the low-enriched uranium (LEU) product. In March 1999, formal discussions were initiated with the IAEA on a verification approach for downblending the HEU. In an effort to minimize costs and impacts on IAEA resources, the IAEA safeguards approach verifies only the nuclear material flows around the blending tanks (instead of verifying the flows from receipt to shipment of the nuclear materials). The primary objective of the proposed approach is the international verification of the downblending of the declared quantity of HEU to LEU. The U.S. will pay the initial costs of the verification activities through extrabudgetary contributions. The IAEA is evaluating options for funding nuclear arms control and verification activities such that the costs are not solely borne by the inspected country (see Attachment 9 of the main document).

NMSS is currently facilitating the application of IAEA safeguards at the BWX Technologies Downblending Facility. The facility design information questionnaire, which was prepared by the operator and submitted to the IAEA, forms the basis on which the IAEA will establish its inspection activities. A facility attachment document will be negotiated between the U.S. and IAEA to formally define the international safeguards measures the IAEA will apply, as well as the U.S. and IAEA implementation responsibilities. To facilitate safeguards implementation, NMSS receives, reviews, and has transmitted to the IAEA, from the U.S. Nuclear Materials Management and Safeguards System (Attachment 4 of the main document), monthly inventory change reports and annual material balance reports.

Additionally, NMSS is also responsible for receiving, reviewing, and authorizing transmittal to the IAEA, of the monthly inventory change reports, concise notes, annual physical inventory reports, and annual material balance reports for the five fuel fabrication facilities selected by the IAEA under the reporting protocol to the U.S.-IAEA Agreement.

## **2. IMPLEMENTATION OF THE NEW STRENGTHENED SAFEGUARDS SYSTEM**

The President committed the U.S. Government to implement the new Protocol safeguards measures as fully as possible, except where they involve information or locations of direct national security significance to the U.S. The staff at the Department of State, in coordination with staff from the DOE, the Department of Defense, and the NRC, developed a plan of action for interagency-coordinated activities, to bring the protocol into force. An interagency agreement was developed to address the principles and process for application of the national security exception.

NMSS has reviewed the "Additional Protocol's" contents, evaluated NRC's role in its implementation, evaluated the need for implementing legislation (to establish or to clarify statutory authorities), and initiated rulemaking to implement NRC's responsibilities. 10 CFR Parts 40, 75, 110, and 150 will be revised. Implementation will require coordination between the NRC and the Agreement States, to facilitate the submittal of information from the licensee sites and locations.

The SISUS is coordinating the development of consensus interagency guidelines for implementation of the protocol. NMSS and staff from the other agencies are drafting procedures to guide compliance with the "Additional Protocol" measures. On completion of the consensus interagency guidelines, NMSS will develop guidance and procedures to ensure NRC and the licensee compliance with the "Additional Protocol." When the IAEA requests access to a specific licensee location to verify declared information, NMSS will facilitate IAEA inspections and the implementation of procedures to protect proprietary, sensitive, or classified information at the licensee sites.

## **NUCLEAR MATERIALS MANAGEMENT AND SAFEGUARDS SYSTEM**

The U.S. Nuclear Regulatory Commission (NRC) is responsible for partially funding and directing the operations of the national database for material control and accounting – the Nuclear Materials Management and Safeguards System (NMMSS). The U.S. Department of Energy (DOE) has contractual and management responsibility for the NMMSS, which is operated by NAC International. The NRC contractually participates in the funding of NMMSS, to cover operational needs associated with the processing of data from NRC licensees and certificate holders. An Office of Nuclear Material Safety and Safeguards (NMSS) staff member acts as the NRC technical project manager for the NMMSS contract. NMSS, along with Office of International Programs staff, represents the NRC on the NMMSS Steering Committee.

Two NUREG documents – NUREG/BR-0006 and -0007 – provide guidance, to NRC licensees, on completing and submitting data to NMMSS via joint NRC and DOE forms. Licensees use these forms to document nuclear material transactions and inventory. The licensees submit the forms directly to NMMSS for processing and updating of the data base. NMSS updated these NUREGs during 1999 to incorporate guidance for the gaseous diffusion plants, which recently came under NRC's regulatory authority. NMSS routinely submits the associated forms for Office of Management and Budget approval.

NMSS aids licensees throughout the year by responding to and assisting in resolving issues related to data submission to NMMSS. NMSS initiates actions to resolve licensee data submissions that violate the operating parameters of NMMSS. The submission issues include incomplete data submission, incorrect use of codes to report nuclear material activities, and not reporting measured results from material receipts, among others. NMSS also participates extensively in the yearly NMMSS Users Meetings. Recommendations developed during this yearly meeting led to the licensees submitting higher-quality data to NMMSS.

Two major revisions to NMMSS are currently being assessed:

- The computer industry no longer supports the current NMMSS database platform (Microsoft FoxPro) software; thus, the transfer of NMMSS to the ORACLE software platform, which is supported by the industry, has been proposed. NMSS is participating on the NMMSS Upgrade Project Management Council to review the proposed changes to the system. The DOE has proposed a level of funding that the NRC should provide to support the NMMSS upgrade. This request, and the potential budget impacts, are currently under evaluation.
- Under the ORACLE platform, a new simplified system to track and identify foreign-obligated nuclear material is being developed. The new system is intended to improve compliance with the obligation-tracking requirements while imposing less burden on both the U.S. Government and licensees. NMSS will monitor and guide the development of the new system to ensure that NRC needs are met and that the required information is efficiently collected from the licensees.

## STRENGTHENING OF INTERNATIONAL SAFEGUARDS

### 1. BACKGROUND

From the date of the founding of the International Atomic Energy Agency (IAEA) in 1957, efforts to strengthen international safeguards have been ongoing. Beginning in 1965, INFCIRC/66-type safeguards agreements were implemented at selected nuclear facilities. In 1970, the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) came into force and in 1972, the first INFCIRC/153-type safeguards agreements with the IAEA came into force. INFCIRC/153 agreements applies to all source and fissile nuclear material in the signatory Non-Nuclear Weapon States. Under these agreements, verification measures are applied to the declared material. The additional protocol to the safeguards agreements (based on the INFCIRC/540 model protocol), continues the strengthening of IAEA safeguards by providing the IAEA with the statutory authority to collect information to assist in locating undeclared nuclear material and facilities in the Member States. The new measures support the IAEA's goal of verifying the accuracy and completeness of States' declarations. The strengthened statutory authorities have been accompanied by the continual strengthening of the technical capabilities of the Inspectorate.

Discovery of the clandestine Iraqi program in 1991 led to the realization that IAEA safeguards needed to be further strengthened. The focus of IAEA safeguards at that time was to ensure that nuclear material a State declared that it was in possession of was present in that country and was used only for peaceful nuclear activities. The primary IAEA activities were the review and evaluation of reports of transfers and inventories of material under IAEA safeguards, and the conduct of inspections to observe and verify inventories and flows of the declared material. As a result of the Iraq revelations, it was recognized that the IAEA needed to broaden its program to improve its capability to detect and guard against undeclared nuclear material and clandestine activities. This recognition was reflected in a number of IAEA Board of Governors' decisions, beginning in December 1991.

Efforts to further strengthen the IAEA's safeguards system were initiated in 1993, with the identification of measures to improve both the effectiveness and efficiency of safeguards. Those new measures that the IAEA had authority to implement were adopted in 1995; those for which the IAEA did not have current authority required the approval of a new protocol additional to a State's safeguards agreement(s) with the IAEA.

At a special meeting of the IAEA Board of Governors in May 1997, the Governors approved the *Model Protocol Additional to the Agreements between the States and the IAEA*. The Model Protocol provides IAEA with the legal authority to request additional information from the States and to expand IAEA physical access and inspections measures to locations on sites outside of the declared nuclear facilities and to other locations in a State. At the May 1997 special meeting of the IAEA Board of Governors, the U.S. representative read a message from President Clinton stating:

"The U.S. stands ready to accept the new safeguards measures as fully as possible in our country consistent with our obligations under the Nuclear Non-Proliferation Treaty (NPT). The U.S. intends to do so by accepting the Protocol in its entirety and applying all of its provisions except where they involve information or locations of direct national security significance to the U.S. It is our intention to make the Protocol legally binding."

At the June 1998 Board of Governors meeting, the Governors approved and the United States and IAEA signed the "Protocol Additional to the U.S.-IAEA Safeguards Agreement." The U.S. Additional Protocol is scheduled to be submitted during FY 2001, as a treaty, to the Senate, for its consent to ratification.

The IAEA is currently undertaking efforts to integrate the new strengthening measures into the IAEA safeguards system. The strengthening measures are to provide the means to more effectively and efficiently verify the accuracy and completeness of a State's declarations. Integration is to eliminate redundancies between the existing and new measures without weakening the system. The examination of integrated safeguards was initially undertaken by the IAEA Director General's Standing Advisory Group on Safeguards Implementation (SAGSI) – to which the Office of Nuclear Material Safety and Safeguards (NMSS) provides the sole U.S. representative, and more recently by the Member States, through a consultants meeting – to which NMSS provided an expert. The integration of the strengthening measures is also being addressed through the U.S. Support Program to the IAEA – on which NMSS represents the U.S. Nuclear Regulatory Commission (NRC) on the interagency coordination committee (the Subgroup on Safeguards Technical Support).

The integration of new safeguards measures to replace older, less effective or less efficient, measures is an understood process that the IAEA routinely conducts. The integration of concepts, which requires reexamining the basic approaches of IAEA safeguards, is a more difficult topic on which to acquire international consensus. This evaluation must determine if the qualitative measures, to be implemented to detect undeclared activities, can replace or reduce quantitative material accounting (including containment and surveillance) measures implemented to detect nuclear material diversions from facilities possessing source materials, low-enriched uranium, and irradiated fuels.

The Member States are developing candidate integrated safeguards for their fuel cycles. The U.S. Support Program (known as the Program of Technical Assistance to Safeguards) is developing an evaluation methodology, for IAEA consideration, against which the proposals can be evaluated. The methodology includes reference criteria built from the safeguards goals and objectives to provide a basis against which the effectiveness of the proposals can be judged. The integrated safeguards approaches will also need to be considered within the context of the IAEA's budget. The priority of the safeguards objectives will need to be evaluated to determine what objectives, if not achieved by the integrated safeguards approaches because of the lack of money, would have the least detrimental impacts on the safeguards assurances provided by the IAEA.

## **2. NRC RESPONSIBILITIES**

NMSS provides strong support to strengthening IAEA safeguards to assure effective implementation of commitments made in accordance with the provisions of the NPT. These efforts include: supporting development of effective measures to verify the accuracy and completeness of States' declarations; providing technical expertise to U.S. Government interagency initiatives to strengthen IAEA safeguards; and coordinating the testing and implementation of new IAEA safeguards measures at NRC-licensee facilities to promote the application of the new measures in other States. NRC activities include the following:

- Participating on interagency committees developing U.S. safeguards and nonproliferation policy – IAEA Steering Committee; Subcommittee on International Safeguards and Monitoring; Subgroup on Safeguards Technical Support; Subgroup on IAEA Safeguards in the U.S. (NMSS Chairs); and Nuclear Material Management and Safeguards System Steering Committee.



- Participating on international committees developing or supporting development of IAEA safeguards policy – IAEA Director General's SAGSI (NMSS provides the sole U.S. Government representative); IAEA Experts Group for Programme on Safeguards for the Final Disposal of Spent Fuel in Geologic Repositories; and International Working Group on Alternate Nuclear Materials.
- Participating in international advisory group meetings, consultants meetings, working group meetings, workshops, and conferences addressing enhancements to safeguards measures, to permit more effective and efficient implementation of State and IAEA measures.
- Providing training to safeguards professionals from other countries on the implementation of State systems of accounting and control.

## **INTERNATIONAL PHYSICAL PROTECTION SUPPORT**

The Office of Nuclear Material Safety and Safeguards (NMSS) participates jointly with other U.S. Government agencies in information exchange meetings to review physical protection arrangements for U.S.-obligated nuclear materials in other countries. NMSS periodically leads these delegations. Formal reports are developed as a result of these meetings and these reports support NMSS' physical protection technical reviews of export control licensing and retransfer requests.

The U.S. Nuclear Regulatory Commission (NRC) routinely hosts countries for discussions concerning physical protection or to observe site-specific physical protection practices or both. Many of these visits have centered around NRC's physical protection performance assessment programs, most notably the NRC's Operational Safeguards Response Evaluation program (force-on-force exercises) and Regional Assists (security systems testing), as well as other inspection programs. Countries that visited the NRC within the last few years include Russia, the Ukraine, Kazakhstan, Armenia, Canada, China, the Czech Republic, France, Germany, Hungary, Japan, Lithuania, Romania, South Korea, and the United Kingdom. Countries that have expressed an interest in visiting the NRC to observe NRC-licensee physical protection practices, include Sweden, Finland, and South Africa.

NMSS also participates in international advisory group meetings, consultants meetings, working group meetings, workshops, and conferences addressing enhancements to physical protection measures to permit more effective and efficient International Atomic Energy Agency (IAEA) Member State implementation of the measures. NMSS participated in and chaired international working group meetings to enhance the IAEA's physical protection guidance document (INFCIRC/225) and the "Convention on Physical Protection" (INFCIRC/274). NMSS chaired the working group enhancing the INFCIRC/225 technical guidance document and participated on the working group enhancing the INFCIRC/225 physical protection guidance handbook. NMSS has served as a team member on IAEA International Physical Protection Advisory Service missions to Poland, Lithuania, Latvia, and Slovenia. These missions evaluate the physical protection regulatory systems for nuclear materials and facilities in IAEA Member States. The missions also provide advice to the host country on ways to improve their regulatory implementation to comply with international standards of practice.

NMSS also provides physical protection support to key Former Soviet Union republics. NMSS is supporting regulatory agencies in Russia, Ukraine, and Kazakhstan, to assist in the development of physical protection regulations and licensing and inspection programs. This assistance is discussed in detail in Attachment 7 of the main document.

## **FORMER SOVIET UNION MATERIAL PROTECTION CONTROL AND ACCOUNTING SUPPORT PROGRAM**

A coordinated interagency effort, currently known as the Cooperative Threat Reduction (CTR) Program, was initiated in 1992 to support key Former Soviet Union (FSU) republics in improving their control over nuclear materials. The Office of Nuclear Material Safety and Safeguards (NMSS) provided assistance to the material protection, control, and accounting (MPC&A) effort. This support was provided through agreements using funds provided by the "Soviet Nuclear Threat Reduction Act of 1995" (Nunn-Lugar). As part of this program, NMSS provided support to the regulatory agencies in Russia, Ukraine, and Kazakhstan in the development of safeguards regulations and in the development of licensing and inspection programs. NMSS' efforts were in addition to those efforts undertaken by the U.S. Department of Energy (DOE) to provide technical training and MPC&A system upgrades at FSU facilities, along with some Russian regulatory support.

The primary goal of NMSS' assistance to the FSU nuclear regulators is to provide the U.S. Nuclear Regulatory Commission's (NRC's) regulatory experience to the developing regulatory programs, while accommodating country-specific needs, legal structures, and levels of resources. The NRC's regulatory cooperation with its counterparts in these countries is important because the cooperation helps these regulators ensure that safeguards measures are consistently applied in an effective and appropriate manner and maintained over time. NMSS has focused on providing assistance in developing regulations and reviewing regulatory documents, as well as in supporting the development of licensing and inspection programs. In Kazakhstan, the NRC has been working with the Atomic Energy Agency of the Republic of Kazakhstan; in Russia with Gosatomnadzor (GAN); and in Ukraine with the Ministry of Environmental Protection and Nuclear Safety.

The U.S. and Russia signed an implementing agreement in September 1993. The Ukraine and Kazakhstan signed implementing agreements with the U.S. in December 1993. Under the CTR program, the NRC and the DOE worked to develop a program plan, of initial MPC&A support activities, that was approved by the former Defense Nuclear Agency.

In addition to the CTR program, the NRC and the GAN developed a program of MPC&A regulatory support under Priority 6 of the "Newly Independent States Nuclear Safety Initiative" (Lisbon Initiative). Regulatory support activities between the NRC and the GAN in this program began in early 1995. Under the Lisbon Initiative, annual program meetings have been held at the NRC, during which tasks to be addressed during the next calendar year have been formulated.

Examples of recent NRC assistance include the following cooperative support activities :

- Provided draft MPC&A regulations for Kazakhstan and draft physical protection regulations for Ukraine.
- Conducted physical protection licensing workshops for Russian, Ukrainian, and Kazakhstani regulators.
- Arranged for inspectors from Russia, Ukraine, Kazakhstan, and Armenia, to observe an operational safeguards response evaluation.
- Conducted MPC&A licensing workshops for Russian and Kazakhstani regulators.

- Conducted a physical protection inspection workshop for Russian, Ukrainian, Kazakhstani and Armenian inspectors.
- Conducted a Design Basis Threat/Vulnerability Assessment Workshop for Russian, Ukrainian, and Kazakhstani regulators.

Multi-year CTR program funding for NMSS' MPC&A assistance to Russia, the Ukraine, and Kazakhstan expired in September 1998. At that time, most of the \$2.7 million in funds had been expended. In anticipation of this, in early 1997, NMSS contacted the DOE to request its assistance in providing additional MPC&A program funding for NRC use, beginning fiscal year 1999. (Presidential Decision Directive/NSC-41, issued in September 1995, states that the DOE is the lead U.S. agency for MPC&A activities and is responsible for funding work under this program. It also states that the NRC should continue its MPC&A support efforts.) At the beginning of fiscal year 1999, NRC assistance efforts were placed on hold pending the completion of an NRC-DOE MPC&A Interagency Agreement (IA). The IA was signed by DOE on May 15, 2000, and by NRC on July 7, 2000. In the IA, DOE provided \$165,000 of initial "no-year" funding to NRC to cover NRC FTEs and task support. NRC officials met with DOE on July 27, 2000, to determine NRC's initial tasks under the IA. The funding level to be provided for NRC's FY2001 tasks is expected to be decided by DOE in September 2000.

## **HIGHLY ENRICHED URANIUM PURCHASE CONTRACT TRANSPARENCY**

In 1993, the U.S. Government and the government of Russia agreed to the U.S. purchase of low-enriched uranium (LEU) resulting from the downblending of 500,000 kilograms (500 tons) of highly enriched uranium (HEU) removed from Russian nuclear weapons. This agreement was implemented through the "1993 U.S.-Russian Government to Government Agreement," 1993 "Memorandum of Understanding to Implement the Agreement," and 1994 "Protocol on Transparency." The protocol specifies transparency measures to assure the U.S. that the LEU resulted from the downblending of weapons-origin HEU and to assure Russia that the LEU would not be re-enriched in the U.S. for use in weapons. The Russian-product LEU is being shipped to the Portsmouth Gaseous Diffusion Plant for isotopic tailoring, converted to power reactor fuel at U.S. fuel fabrication plants, and shipped to commercial power reactors for irradiation. To implement the transparency agreement in the U.S., Russia has established the right to implement a permanent-presence office at the Portsmouth Gaseous Diffusion Plant and to visit the participating fuel fabrication plants.

The U.S. Nuclear Regulatory Commission (NRC) participated in the negotiation of the initial agreements and the annexes to the agreements; the Office of Nuclear Material Safety and Safeguards (NMSS) participates in the periodic technical review committee meetings, where these agreements are discussed and clarified. NMSS' role is to coordinate the HEU transparency activities with the NRC licensees. NMSS' initial role was to ensure that licensee proprietary concerns were considered in negotiation of what data were to be provided and of physical access to plant areas by Russian representatives. NMSS currently coordinates Russian monitor visits to the enrichment plants and LEU fuel fabrication plants. In 1997, Russian monitors visited two U.S. LEU fuel fabricators. NMSS also supports preparation of the annual summary reports on the import and use of the downblended HEU. This effort involves coordination of information in the draft summary report with the five NRC-licensed LEU fuel fabricators, to assure the accuracy of the data before the data are submitted to the Russian Government.

## **TRILATERAL VERIFICATION INITIATIVE**

During the April 1996 nuclear summit in Moscow, Russia, the participants pledged their support for efforts "... to ensure that all sensitive nuclear material [separated plutonium and highly enriched uranium (HEU)] designated as not intended for use in meeting defense requirements is safely stored, protected and placed under IAEA safeguards (in Nuclear-Weapons States under the relevant voluntary offer IAEA safeguards agreement) as soon as it is practicable to do so."

As a follow-up to the Moscow Summit, on September 17, 1996, a meeting was held [on the margins of the 40th International Atomic Energy Agency (IAEA) General Conference] to consider practical measures to fulfill statements by President Clinton (September 1993) and President Yeltsin (April 1996) concerning IAEA verification of weapons-origin fissile material. The meeting principals were IAEA Director General Blix, U.S. Secretary of Energy O'Leary, and Russian Minister of Atomic Energy Mikhailov. Former U.S. Nuclear Regulatory Commission Chairman Jackson also participated in this meeting. At the meeting, the three parties agreed to form a joint group to study and report on the technical, legal, and financial issues associated with IAEA verification of the released materials. The three parties also agreed that bilateral U.S.-Russian discussions would take place to address protection of weapon-sensitive information. Since October 1996, the Office of Nuclear Material Safety and Safeguards has participated in U.S. Government interagency, as well as the Trilateral, meetings and document reviews.

The IAEA monitoring and verification measures are to provide international confidence that the relevant fissile materials declared by the U.S. and Russia as no longer required for defense purposes remain outside the weapons programs. Work has focused on developing technical measures for verifying material with classified properties without revealing classified information to the IAEA. These measures will likely be applied to the HEU downblending at BWX Technologies and potentially to Nuclear Fuel Services, if that facility processes and downblends weapons-excess HEU.

Other issues considered have included measures appropriate for verifying nuclear material in an arms control rather than a non-proliferation context; legal arrangements that will provide for the irreversible removal of material from weapons programs; and financial arrangements for funding IAEA verification activities. Work continues to be conducted in these three areas. The three parties met in Vienna at the Minister level during the 1997, 1998, and 1999 General Conferences, to receive progress reports from the working group, and to report to the public on progress through the issuance of press releases.

The IAEA's Director General provided two related reports to the June 1999 IAEA Board of Governors meeting. The first, GOV/INF/1999/8, addressed the Trilateral Initiative itself, now referred to as "IAEA Verification of Weapon-Origin Fissile Material in the Russian Federation and the United States of America." The second, GOV/INF/1999/9, addressed options for financing a nuclear arms control verification fund, which the Director General originally proposed in June 1998.

A more detailed description of the Trilateral Verification Initiative activities was provided to the Commission in SECY-00-0139 (dated June 23, 2000).