Integrated Safeguards

U.S.-IAEA Safeguards Agreement

U.S.-IAEA Additional Protocol

Product No. 612P

READINESS THROUGH AWARENESS

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This pamphlet provides an introduction to the U.S.-IAEA Additional Protocol [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]. The U.S.-IAEA Additional Protocol (U.S.-IAEA AP) entered into force on January 6, 2009. Although the U.S.-IAEA AP contains no new arms control or disarmament obligations for the United States, it does grant the IAEA increased rights to conduct more types of on-site inspection activities at more types of civil nuclear and nuclear-related locations and activities.

This pamphlet begins with a short history of the events leading up to the negotiation and implementation of the U.S.-IAEA Safeguards Agreement [Agreement Between the United States of America and the International Atomic Energy Agency for the Application of Safeguards in the United States], which entered into force in 1980. Together, the provisions of the U.S.-IAEA Safeguards Agreement and the U.S.-IAEA Additional Protocol are referred to as "integrated safeguards."

Basic Safeguards Terms

Key terms used in IAEA safeguards agreements and additional protocols, have very specific meanings, even though these terms may have broader meanings when used in other contexts. For example, when applying integrated safeguards, the term "facility" refers to a location capable of making more than 1 kilogram of nuclear material suitable for use in a nuclear device. The term "location outside facilities" refers to locations capable of making 1 kilogram or less of nuclear material suitable for use in a nuclear device.

A list of safeguards terms and definitions is provided in the Terms & Abbreviations section beginning on page 17. A comprehensive *Arms Control Security Glossary* (product number 941P) can also be downloaded from the DTIRP website or requested from the DTIRP Outreach Program. This glossary contains an extensive number of nuclear-related terms, diagrams, and a brief tutorial on the nuclear fuel cycle.

NPT and Safeguards Agreements

The Nuclear Non-Proliferation Treaty [Treaty on the Non-Proliferation of Nuclear Weapons] (NPT) is the primary legal and political barrier against the proliferation of nuclear weapons. This treaty entered into force in 1970 and acknowledged five States Parties as nuclear weapon states (NWS): China, France, Russia, the United Kingdom, and the United States.[1] All other States Parties were designated as non-nuclear weapon states (NNWS).[2]

NNWS are obligated not to acquire or produce nuclear weapons or nuclear explosive devices. NWS, such as the United States, are obligated not to transfer nuclear weapons or other nuclear explosive devices or technologies to NNWS. To verify treaty compliance, the NPT obligates NNWS to conclude bilateral safeguards agreements with the IAEA. Under these agreements, NNWS agree to declare their nuclear materials and activities, and to allow the IAEA to conduct on-site inspections to verify the accuracy of declared information and to ensure no nuclear material has been diverted away from peaceful nuclear activities.

NWS have no obligation to conclude safeguards agreements with the IAEA. However, all five NWS, including the United States, have done so voluntarily in order to demonstrate their support for the IAEA's international safeguards regime and to encourage NNWS to conclude these agreements. In particular, by declaring their civil nuclear activities and allowing the IAEA to conduct on-site inspections, NWS share the burden of applying safeguards and help to ensure

[1] The NPT defines an NWS as a state that "has manufactured and exploded a nuclear weapon or other nuclear device prior to January 1, 1967."

[2] India, Israel, and Pakistan are not party to the NPT. North Korea withdrew from the treaty in January 2003.

that NNWS are not placed at an unfair economic disadvantage. This could be a potential unintended consequence of the IAEA's safeguards regime if NNWS alone bore the costs associated with declaring nuclear activities and hosting IAEA inspections.

The potential for placing NNWS at a competitive disadvantage was a serious issue raised during the NPT negotiations conducted in the 1960s. Of greatest concern were the potential economic effects on industrialized NNWS such as Germany and Japan. To ensure equity and fairness, President Johnson announced on December 2, 1967 that the United States would voluntarily conclude a Safeguards Agreement with the IAEA provided the following two conditions were met:

- U.S. activities associated with national security would be excluded; and
- the Safeguards agreements for NNWS would enter into force before the U.S.-IAEA Safeguards Agreement.

This announcement was known as the "Voluntary Offer." Consequently, the U.S.-IAEA Safeguard Agreement is often referred to as the "Voluntary Offer Agreement." The U.S.-IAEA Safeguards Agreement (INFCIRC/288) was signed in November 1977, and entered into force on December 9, 1980. Like the safeguards agreements between the IAEA and NNWS, and those between the IAEA and the other NWS, the U.S.-IAEA Safeguard Agreement is based on the IAEA's Model Safeguards Agreement (INFCIRC/153).

Under the U.S.-IAEA Safeguards Agreement, the United States declared nearly 300 commercial and government nuclear facilities. Since that time, the IAEA has elected to conduct safeguards inspections at only four facilities. The United States continues to declare its civil nuclear facilities but, as an NWS, all sites, facilities, and locations having direct national security significance are excluded.

Strengthened Safeguards

The need to strengthen the IAEA's safeguards regime became clear in the 1990s when secret nuclear weapons programs were discovered in Iraq and North Korea. Following these discoveries, the United States encouraged the IAEA to increase its capabilities for detecting clandestine nuclear activities in NNWS. In 1993, the

IAEA undertook this effort, known as the "Strengthened Safeguards Program" or as the "93+2 Program" because the goal was to complete a plan of action within two years—in time for the 1995 NPT Review Conference.

At the 1995 NPT Review Conference, the IAEA presented its plan to strengthen safeguards. This plan was based on three elements:

- increasing access to information about a state's nuclear activities;
- gaining broader access to nuclear facilities and other locations; and
- maximizing the use of new equipment and detection technologies.

A number of these strengthened safeguards measures could be implemented under the IAEA's existing authority, as granted under current safeguards agreements. These measures included increasing the IAEA's capabilities for determining the completeness and correctness of declared information, and for collecting and analyzing information. For example, at declared facilities IAEA inspectors had the right to take environmental samples, conduct short notice inspections, and use radiation detection equipment.

However, other strengthened safeguard measures were also proposed that could not be implemented under the IAEA's existing legal authority. These measures included allowing IAEA inspectors access to undeclared locations potentially related to the production or development of nuclear weapons in NNWS. To provide this authority, it was necessary for the IAEA to develop a new agreement. For this purpose, and with the support of the United States and the international community, the IAEA Board of Governors adopted the Model Additional Protocol (Model AP) in May 1997. The Model AP became the basis for all additional protocols (APs) concluded with the IAEA. The combination of a state's (NNWS or NWS) existing safeguards agreement(s) with its AP is variously known as "integrated safeguards," "comprehensive safeguards," or "strengthened safeguards."

Model Additional Protocol

The Model AP (INFCIRC/540) expands the IAEA's rights to collect information and to access more types of sites, facilities, and locations. These rights include allowing access to undeclared locations in NNWS that could potentially be involved in secret nuclear weapons programs. The purpose of the Model AP is to increase the IAEA's capabilities for detecting and deterring clandestine nuclear activities in NNWS.

The United States believes the Model AP is a vital tool for preventing the proliferation of nuclear weapons. Collectively, the data provided to the IAEA under each state's AP substantially increases the amount of information available to the agency about the nuclear material and nuclear-related activities conducted worldwide. Using this data, the IAEA is better able to detect a secret diversion of nuclear materials or the development of a secret nuclear weapons program. This serves to deter NNWS from developing such programs and provides the international community with a greater degree of assurance that the nuclear activities conducted by NNWS are for legitimate peaceful purposes.

U.S.-IAEA Additional Protocol

The United States voluntarily concluded the U.S.-IAEA Additional Protocol (INFCIRC/288.1) to demonstrate its support for strengthening the IAEA's safeguards regime and to help promote universal implementation of the Model AP. As was the case with the U.S.-IAEA Safeguards Agreement, the United States was under no obligation to conclude an AP with the IAEA or to declare its nuclear activities, civil or weapons-related, because the United States is an acknowledged NWS under the NPT.

The U.S.-IAEA AP entered into force on January 6, 2009, and includes all of the provisions in the Model AP. In accordance with these provisions, the United States declared additional civil nuclear and nuclear-related activities, with one

important exception. As is its right as an NWS, the United States does not declare activities with direct national security significance and will apply managed access procedures to protect national security, confidential business, and proliferation-sensitive information from disclosure.

The right to exempt all activities, locations, and information with direct national security significance from declaration or access by IAEA inspectors is described in Article 1.b of the U.S.-IAEA AP. This provision is known as the U.S. national security exclusion (NSE). Articles 1 and 7, plus a specially negotiated U.S.-IAEA subsidiary arrangement on managed access, specify the United States' rights to apply managed access procedures as the U.S. deems appropriate and to maintain U.S. safety and security standards during on-site inspections.

Although the U.S.-IAEA AP is very similar to the Model AP, its purposes are entirely different. Instead of enabling the IAEA to uncover illicit nuclear activities or non-compliance with the NPT, the purpose of the U.S.-IAEA AP is to "assist [the IAEA] in developing the procedures, tools, and techniques that will strengthen the capability of the [IAEA] to detect undeclared nuclear activities in NNWS."[3]

At U.S. declared sites, it is vitally important to identify critical information and its indicators, and to appropriately protect this information from inadvertent disclosure or from being compromised during on-site IAEA inspection activities. Conducting security vulnerability assessments (SVAs) for this purpose is essential for ensuring site safety and security. (See DTIRP product number 608P for more information and suggested checklists for use when conducting SVAs associated with implementing the U.S.-IAEA Additional Protocol.)

The IAEA's confidentiality regime also helps to protect the information obtained from a state's data declarations and the on-site inspection activities conducted by IAEA inspectors.

[3] Secretary of State "Letter of Transmittal to the President of the United States" of April 30, 2002; and Susan F. Burk, Assistant Secretary of State "Testimony before the Senate Foreign Relations Committee" on January 29, 2004.

Similarities and Differences

The following two text boxes list key similarities and differences between implementing the U.S.-IAEA Safeguards Agreement alone, and implementing both the U.S.-IAEA Safeguards Agreement and the U.S.-IAEA Additional Protocol together under integrated safeguards. The information in Text Box 1 and Text Box 2 is intended to help implementers identify what has changed and what has remained the same since the U.S.-IAEA AP entered into force (EIF) on January 6, 2009.

Integrated Safeguards—What Remains the Same?

(Since the U.S.-IAEA AP entered into force)

1. U.S. national security exclusion (NSE).
2. Inspection activities at declared facilities selected by the IAEA.
3. IAEA continues to select facilities that:
    - utilize advanced design;
    - incorporate new technology; and
    - impact international competition.

Text Box 1

[7] Colin Powell, Secretary of State, "Letter of Transmittal to the President of the United States," April 30, 2002; and Susan F. Burk, Assistant Secretary of State, Acting, for Nonproliferation, "Testimony before the Senate Foreign Relations Committee," January 29, 2004.

Integrated Safeguards—What Changed?

(Since the U.S.-IAEA AP entered into force)

1. More detailed information on declared sites includes:
    - declaring locations and nuclear fuel cycle-related activities not involving nuclear material; and
    - providing general descriptions of a site, including a map, and a description of each building, its use, and contents.
2. The number of U.S. inspectable locations increased to include mines and locations without nuclear materials (see text boxes 3 and 4).
3. Advance notification time can be shorter under certain circumstances.
4. Access, in certain circumstances, may not be limited to declared facilities and strategic points specified in declarations, but may be granted to any place on the site, collocated facilities, and to decommissioned facilities.
5. Additional inspection activities may include:
    - collecting environmental samples (no need for this activity is expected except, possibly, for training purposes); and
    - using radiation detection and measurement devices.

    Note: Under the U.S.-IAEA Safeguards Agreement, IAEA inspection activities were limited to:
    - applying tamper-indication seals;
    - examining records;
    - taking measurements of nuclear material; and
    - taking samples at specified key measurement points.
6. Nuclear fuel cycle-related activities and locations not involving nuclear materials may be declarable.

Text Box 2

Defining a Site

The Model AP (INFCIRC/540) narrowly defines a "site" as one of the following: an area delineated as a facility; a closed-down facility; or as a location outside facilities where nuclear material is, or was, used as specified in relevant design information. For locations outside facilities where nuclear material was customarily used, the definition of a site is limited to those locations containing hot cells. These sites are defined as locations where activities relating to the conversion, enrichment, fuel fabrication, or reprocessing of nuclear materials were conducted.

A site also includes all collocated installations that provide essential services. These include:

- hot cells for reprocessing irradiated material not containing nuclear material;
- installations for the treatment, storage, and disposal of waste; and
- buildings associated with activities specified in Annex I of the U.S.-IAEA AP (see Text Box 3).

Impacted Locations

The types of facilities, plants, locations, and equipment to be declared under the AP include:

- agreed locations outside facilities;
- closed-down facilities;
- agreed decommissioned facilities;
- thorium concentration plants;
- uranium mines and concentration (milling) plants;
- locations conducting certain nuclear fuel cycle-related research and development (R&D) activities not involving nuclear material;
- scale of operations for all areas manufacturing key reactor, fuel processing, and fuel separation components (See Annex I of the U.S.-IAEA AP);

U.S.-IAEA AP Annex I
Activities to be Declared

The manufacture or assembly of:

- aerodynamic separation nozzles or vortex tubes
- centrifuge rotor tubes (paragraph i)
- columns or extraction equipment used in chemical exchange or ion exchange uranium enrichment plants
- critically safe tanks and vessels
- diffusion barriers
- electromagnetic isotope separators
- flasks for irradiated fuel
- gas centrifuges (paragraph i)
- heavy water or deuterium
- hot cells
- irradiated fuel element chopping machines (paragraph xiv)
- laser-based systems for use in uranium enrichment plants
- nuclear grade graphite
- reactor control rods
- uranium plasma generation systems
- zirconium tubes

Text Box 3

- Nuclear Suppliers Group's 1993 "trigger list" (See Annex II of the U.S.-IAEA AP) of specialized dual-use equipment and non-nuclear material; and
- all imports and exports of dual-use items, material, and technologies.

In the United States, IAEA inspectors may have access to the following types of locations, unless excluded under the NSE:

- any place on a declared site;
- any location identified as normally using nuclear material, including:
  - uranium mines and milling plants;
  - closed-down facilities containing nuclear material;

  - locations with intermediate or high-level waste containing highly enriched uranium (HEU), uranium-233, or plutonium;
- any decommissioned facility or decommissioned location outside facilities;
- any location identified by the United States as conducting certain specified nuclear fuel cycle-related research and development (R&D) activities not involving nuclear material;
- any location identified as producing and/or trading specific, specialized, dual-use equipment, components, or non-nuclear material involved in nuclear fuel cycle activities (listed in Annexes I and II); and
- other locations identified by the IAEA for the purpose of carrying out environmental sampling. (Note: The United States does not expect circumstances to arise in which the IAEA would have a reason to request environmental sampling in this country. Such sampling may be allowed on rare occasions for training purposes relating to developing the IAEA's capabilities for detecting secret nuclear activities in NNWS. In the event the United States agrees to allow environmental sampling, but is unable to provide access to the requested location, the United States will make every reasonable effort to satisfy IAEA requirements at an alternative location or through other means.)

U.S.-IAEA AP Annex II

Specified plants, equipment, and material:

- fuel-element fabrication plants
- non-nuclear materials for reactors
- plants for producing heavy water, deuterium, and deuterium compounds
- reactors and reactor equipment
- reprocessing plants for irradiated fuel elements
- uranium conversion plants
- uranium isotope separation plants

Text Box 4

Complementary Access

Article 4 specifies the AP's provisions for allowing IAEA inspectors to request complementary access in order to "assure the absence of undeclared nuclear material and activities." IAEA inspectors also have the right to request complementary access on short notice to pursue questions relating to compliance and the possible diversion of nuclear material for weapons use.

Although Article 4 explicitly prohibits the IAEA from requesting complementary access for the purpose of "mechanistically or systematically" verifying declarations, it does allow the inspectors to request complementary access on a selected basis and to examine "any place on a [declared] site," as well as "locations outside facilities" involved in nuclear fuel cycle-related activities.

The United States foresees no circumstances under which the IAEA would have a reason to request complementary access in this country. However, in the event that a perceived need arose, before requesting complementary access the IAEA would consult with U.S. government representatives. These consultations would give the United States an opportunity to clarify and resolve any questions or inconsistencies. When requesting complementary access, the IAEA is obligated to submit the request in writing and to specify its reasons for requesting complementary access. The request would also specify the activities IAEA inspectors intend to carry out.

Subsidiary Arrangements

The AP allows member states and the IAEA to negotiate subsidiary arrangements specifying the allowable procedures for implementing certain provisions. Subsidiary arrangements enter into force no later than 90 days after either the member state or the IAEA communicates the need for negotiating the arrangement.

The United States negotiated a subsidiary arrangement with the IAEA on managed access. This arrangement specifies the purposes for which the United States intends to implement managed access procedures and the types of measures it intends to employ. The arrangement entered into force concurrently with the U.S.-IAEA AP on January 6, 2009.

Managed Access

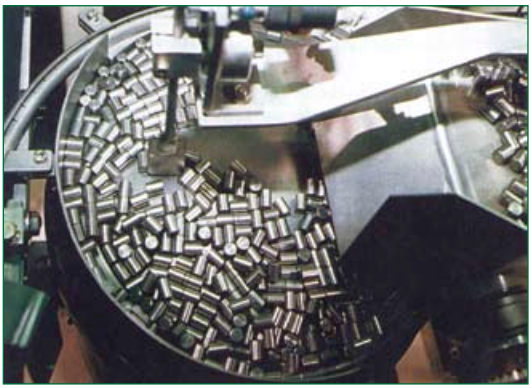
As specified in its subsidiary arrangement with the IAEA, the types of managed access measures the United States may apply include the following:

- removing sensitive papers from offices;
- shrouding sensitive equipment, displays, and stores;
- logging off computer systems and turning off data indication devices;
- restricting safeguards equipment and environmental sampling to the purposes of access; and
- giving only individual inspectors access to certain areas of a location (in exceptional circumstances).

This list is not exhaustive, and other measures consistent with U.S. government or lead agency guidance may also be appropriate.

Unlike the United States, which may decide when and where to apply managed access procedures, NNWS are required to submit a request to the IAEA when they wish to use managed access. Legitimate reasons for requesting the right to apply managed access procedures include to:

- prevent the dissemination of proliferation-sensitive information;
- meet safety or physical protection requirements; and to
- protect confidential business information.



CONCLUSION

Understanding the provisions of the U.S.-IAEA Additional Protocol and the events leading up to the U.S. decision to voluntarily conclude this AP, are important for ensuring the effective implementation of integrated safeguards at U.S. facilities and for achieving international nuclear nonproliferation goals. For U.S. facilities and other impacted locations, having an understanding of the rights contained in the U.S.-IAEA AP enables facility managers and security officers to better protect national security, confidential business, and proliferation-sensitive information during on-site inspection activities.

For promoting U.S. and international efforts to prevent nuclear proliferation, the development of the Model Additional Protocol was an important milestone. The AP increases the IAEA's right to collect more types of information, to conduct more types of inspection activities, and to request access to more types of nuclear fuel cycle-related activities for the purpose of detecting and deterring the development of clandestine nuclear programs in NNWS. The APs of NWS, including the U.S.-IAEA AP, also allow the IAEA to conduct these same types of activities—with key exceptions—for the purpose of assisting the IAEA with developing the skills it needs to fulfill this vital mission.

TERMS & ABBREVIATIONS

AP	Additional Protocol
Decommissioned facility	Closed-down facility from which nuclear material has already been removed
DoD	Department of Defense
DOE	Department of Energy
DTIRP	Defense Treaty Inspection Readiness Program
DTRA	Defense Threat Reduction Agency
Dual-use commodities	Material and industrial equipment with non-nuclear industrial applications that would be of significant value if used in a nuclear explosives program or in a nuclear fuel cycle activity
Effective Kilogram	Special unit of measurement used in safeguarding nuclear material; obtained by: a) for plutonium, the weight of plutonium in kilograms; b) for enriched uranium of 1% and greater, multiplying its weight in kilograms by the square of its enrichment; c) for uranium with an enrichment between 0.5 and 1.0%, multiplying its weight in kilograms by 0.0001; and d) for depleted uranium with an enrichment of less than 0.5% and for thorium, multiplying their weights by 0.00005
EIF	Entry into force
Facility	A reactor, critical facility, conversion plant, fuel fabrication plant, reprocessing plant, isotope separation plant, separate storage installation, or any location customarily using more than 1 effective kilogram of nuclear material

HEU	Highly enriched uranium—uranium containing more than 20% of the isotope uranium-235
IAEA	International Atomic Energy Agency
INFCIRC	IAEA Information Circular—the primary means used by the IAEA to publish documents and agreement texts
INFCIRC/140	Nuclear Non-Proliferation Treaty (NPT)
INFCIRC/153	Model Safeguards Agreement
INFCIRC/288	U.S.-IAEA Safeguards Agreement
INFCIRC/288/Add.1	U.S.-IAEA Additional Protocol
INFCIRC/540	Model Additional Protocol
Integrated Safeguards	Refers to both a country's Safeguards Agreement(s) and Additional Protocol(s)
Lead Agency	The U.S. department or agency responsible for providing information or declarations to the IAEA (i.e. DOC, DOE, and the NRC)
Location outside facility	Any installation or location, which is not a facility, where nuclear material is customarily used in amounts of 1 effective kilogram or less
NNWS	Non-nuclear weapon state(s)
NPT	Nuclear Non-Proliferation Treaty
NRC	Nuclear Regulatory Commission
NSE	National security exclusion
Nuclear material	Any source or special fissionable material as defined in Article XX of the IAEA Statute; does not apply to ore or ore residue

NWS	Nuclear weapon state(s)
R&D	Research and development
Site	The area delimited by the United States in the relevant design information for a facility, a closed-down facility, a location (or closed-down location) outside facilities where nuclear material is/was customarily used. It shall also include all installations collocated with the facility or location for the provision or use of essential services, including hot cells for processing irradiated materials not containing nuclear material, installations for the treatment, storage and disposal of waste, and buildings associated with specified items
Source Material	Uranium containing the mixture of isotopes occurring in nature; uranium depleted in isotope 235; thorium; and any of the foregoing in the form of metal, alloy, chemical compound, or concentrate
Special Fissionable material	Plutonium-239, uranium-233, uranium enriched in the isotopes of 235 or 233, or any material containing one or more of the foregoing material
SVA	Security vulnerability assessment
93 + 2 Program	A commonly used name for the Strengthened Safeguards Program; referring to the year (1993) when the IAEA began work on this plan of action, and to the goal of being able to present the plan two years later at the 1995 NPT Review Conference
U.S.-IAEA AP	U.S.-IAEA Additional Protocol

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