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Guidance for States Implementing Comprehensive Safeguards Agreements and Additional Protocols

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GUIDANCE FOR STATES
IMPLEMENTING COMPREHENSIVE
SAFEGUARDS AGREEMENTS
AND ADDITIONAL PROTOCOLS

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INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 2016

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Strategic Planning and External Coordination Section
International Atomic Energy Agency
Vienna International Centre
PO Box 100
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GUIDANCE FOR STATES IMPLEMENTING COMPREHENSIVE SAFEGUARDS AGREEMENTS AND ADDITIONAL PROTOCOLS

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FOREWORD

IAEA safeguards are a central part of international efforts to stem the spread of nuclear weapons. In implementing them, the IAEA plays an instrumental independent verification role, ensuring that States' safeguards commitments are being respected. A great majority of States have concluded comprehensive safeguards agreements (CSAs) with the IAEA pursuant to the Treaty on the Non-Proliferation of Nuclear Weapons.

It is in the interest of both States and the IAEA to cooperate to facilitate the practical implementation of safeguards, and it is explicitly required under CSAs. Effective cooperation depends upon States and the IAEA sharing a common understanding of their respective rights and obligations. This Guidance is aimed at enhancing States' understanding of the safeguards obligations of both States and the IAEA, and at improving the cooperation between States and the IAEA in safeguards implementation.

States and the IAEA both attach great importance to enhancing their understanding, capability and performance in safeguards implementation. The IAEA Medium Term Strategy 2012–2017 commits the IAEA to “provide States, particularly those introducing nuclear power, with guidance and training on the implementation of their respective agreements.” It also calls on the IAEA to ensure that States have competent State safeguards authorities and to support States in establishing State or regional systems of accounting for, and control of, nuclear material and in making them more effective.

While clearly a requirement for both States and the IAEA, effective cooperation also demonstrates a State's commitment to the peaceful use of nuclear energy and furthers national interests by strengthening nuclear security and reducing the risk of unauthorized use of nuclear material. A partnership between the IAEA and the State can also make safeguards implementation more cost effective and minimize its impact on nuclear operations without compromising the safeguards objectives. The IAEA's activities are becoming increasingly focused and efficient through the development and implementation of the State level concept. Considering the State as a whole provides the opportunity to take State specific factors into consideration in all stages of safeguards implementation. An important State factor is the effectiveness of its national system in controlling the use of nuclear material and technologies within the State and fulfilling its safeguards obligations.

This Guidance is principally intended for State and regional authorities responsible for safeguards implementation, as well as for facility operators. This Guidance is a reference document that will be supported by detailed guidance and examples in Safeguards Implementation Practices Guides to be published separately. A Safeguards Implementation Guide for States with Small Quantities Protocols is also available as IAEA Services Series 22. The entire Services Series on safeguards implementation will be available to States in printed form as well as published on the Resources and Assistance for States web page at www.iaea.org/safeguards, where links to forms, templates and other related documents can also be found.

This Guidance addresses the legal obligations of States and the IAEA in the implementation of safeguards agreements and protocols. The descriptions in this Guidance have no legal status and are not intended to add to, subtract from, amend or derogate from, in any way, the rights and obligations of the IAEA and the States set forth in The Structure and Content of Agreements between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons (issued as INFCIRC/153 (Corrected)) and the Model Protocol Additional to the Agreement(s) between State(s) and the International Atomic Energy Agency (issued as INFCIRC/540 (Corrected)). This Guidance provides information which States may find useful in the exercise of their rights and the discharge of their obligations under their safeguards agreements with the IAEA.

The IAEA wishes to acknowledge the many individuals who have contributed to the creation of this publication. The IAEA officer responsible for this publication was C. Mathews of the Division of Concepts and Planning.

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1. PURPOSE, SCOPE AND STRUCTURE OF THE GUIDANCE

1.1. Purpose of the guidance

This Guidance is aimed at enhancing understanding regarding the safeguards obligations of both the States and the IAEA and improving their cooperation in safeguards implementation. The IAEA Statute, safeguards agreements and protocols thereto, and subsidiary arrangements form the legal basis upon which safeguards are implemented. The legal basis of safeguards is discussed briefly below with respect to the purpose of this Guidance, and in more detail in Section 2.

States enter into safeguards agreements with the IAEA in order to fulfil their non-proliferation commitments. Each non-nuclear-weapon State (NNWS) party to the *Treaty on the Non-Proliferation of Nuclear Weapons* (NPT) [1] (reproduced as INFCIRC/140) is required pursuant to Article III to conclude a comprehensive safeguards agreement (CSA) with the IAEA. IAEA document INFCIRC/153 (Corrected), *The Structure and Content of Agreements between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons* (hereafter referred to as INFCIRC/153) [2], provides the basis for CSAs in connection with the NPT. Under a CSA, the State undertakes to accept IAEA safeguards on all source or special fissionable material in all peaceful nuclear activities within the territory of the State, under its jurisdiction or carried out under its control anywhere. For its part, the IAEA has the corresponding right and obligation to ensure that safeguards are applied on all source or special fissionable material for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or other nuclear explosive devices.

A State may also conclude a protocol additional to its safeguards agreement. IAEA document INFCIRC/540 (Corrected), *The Model Protocol Additional to the Agreement(s) between States and the IAEA for the Application of Safeguards* (hereafter referred to as INFCIRC/540) [3], provides the basis for States' Additional Protocols (AP). Under an AP, a State is required to provide to the IAEA broader access to information and locations related to the State's nuclear fuel cycle than is provided under a CSA.

Many States with CSAs have little or no nuclear material or nuclear activities. Such States may be eligible to conclude a protocol which holds in abeyance¹ the implementation of most of the detailed safeguards procedures of CSAs: a 'Small Quantities Protocol'. The standard text of the Small Quantities Protocol (SQP) [4] was first introduced in 1971, and was available to States which had less than specified quantities of nuclear material and no nuclear material in a nuclear facility. As part of the efforts to strengthen the safeguards system, the IAEA Board of Governors approved a modified text of the SQP (ModSQP) [5], GOV/INF/276 (Mod.1 and Corr. 1), which reduces the number of measures in Part II of INFCIRC/153 that are held in abeyance, and makes an SQP unavailable to a State with an existing or planned nuclear facility. While States' reporting requirements and the conduct of inspections in States with an SQP are far less intense than in States without SQPs, all States must establish a functioning system of accounting for and control of nuclear material and maintain on-going communications with the IAEA.

¹ Paragraphs of the CSA which are 'held in abeyance' pursuant to the SQP are not implemented for such time as the SQP remains in effect.

Voluntary offer agreements have been concluded between the IAEA and the five nuclear-weapon States (NWSs) party to the NPT. Those States are not required to accept safeguards, but have voluntarily offered to do so. In addition, the IAEA applies safeguards under item-specific safeguards agreements, based on the provisions in document INFCIRC/66/Rev 2, *The Agency Safeguards System* [6]. Under such agreements, the IAEA is required to ensure that the nuclear material and other specified items (which may include, for example, non-nuclear material and nuclear facilities) are used only for peaceful purposes and are not used to manufacture nuclear weapons or other nuclear explosive devices, or to further any military purpose.

This Guidance provides information specifically for States with a CSA, including those with an SQP and States with an AP. While this Guidance does not deal with safeguards implementation under voluntary offer or item-specific safeguards agreements, the information provided should also be useful for States with such agreements in force.

The term ‘SSAC’ is referred to in paragraph 7 of INFCIRC/153, which requires the State to set up and operate a national “system of accounting for and control of nuclear material subject to safeguards under the Agreement.” The term SSAC has been widely used in the international safeguards community to denote – often interchangeably – both the administrative entity through which the State discharges its responsibilities for implementing safeguards, and the entire system of regulations, procedures and measures established and implemented within the State to meet the requirements of the safeguards agreement. The term SSAC actually encompasses the entire system, including the authority overseeing the implementation of IAEA safeguards in the State, and all of the other supporting elements, such as operating and accounting records, computerized accounting systems, reporting procedures and other components. In some cases the system is set up at the regional level (a Regional System of Accounting for and Control of Nuclear Material, or RSAC).

This Guidance introduces a new generic term for the authority: the ‘State or Regional Authority with responsibility for safeguards’ (SRA). The SRA is the authority established at the national (or regional) level to ensure and facilitate the implementation of safeguards in a State or States of a region. In addition to its safeguards functions, the SRA (if established within a broader nuclear authority) may have additional responsibilities associated with nuclear safety, security, radiation protection and export/import controls.

It has been recognized that, due to the evolution of the IAEA safeguards system, the responsibilities of SRAs have expanded beyond nuclear material accountancy and the reporting of imports and exports of nuclear material. The SRAs are also responsible for a wide variety of activities associated with the implementation of additional protocols.

1.2. Scope and structure of the guidance

This Guidance is a high-level reference and focuses strictly on the obligations of the parties to safeguards agreements – the IAEA, the State, and, in some cases, a regional organization. The Guidance provides a comprehensive listing of obligations contained in the primary legal documents: the safeguards agreements and protocols, and the model text of the Subsidiary Arrangements (General Part) to the safeguards agreement [7]. More detailed guidance, implementation practices and specific examples which States may wish to use in their own assessments of performance, are provided in subsequent topical guides that follow the basic structure of this reference Guidance. The series of Guidance is intended for use by individuals responsible for safeguards implementation at regional, State and facility levels, as well as for

IAEA staff and those involved in the design of new nuclear facilities and safeguards equipment.

While comprehensive regulation of nuclear energy must address a number of areas, including safety, security, safeguards, environmental protection and emergency response, this Guidance is focused on those elements of the system directly related to the implementation of IAEA safeguards.

In addition to the substantive content, several useful documents, forms, links and examples are provided in the References and Bibliography sections of this Guidance. Sections 3 to 11 each conclude with a list of implementation outcomes which are intended to assist the responsible parties in evaluating whether the basic requirements have been understood and are being met. The Guidance does not provide any legal interpretation of the requirements in the agreements and protocols, and the lists of outcomes are not exhaustive. The outcomes which relate to an AP are preceded by the parenthetical '(AP)' to differentiate them from outcomes associated with a CSA. All of the outcomes are provided in a table format in the Annex, which also indicates which outcomes are applicable to States with a modified SQP. Likewise, in the body of the Guidance, the paragraphs of INFCIRC/153² that are not held in abeyance for States with modified SQPs are followed by the parenthetical '(mod SQP)'. The entire Part I of INFCIRC/153 applies to all States.

2. THE BASIC UNDERTAKINGS OF STATES AND THE IAEA

2.1. The basic legal undertaking

A strong and effective international nuclear non-proliferation regime serves the interest of all States by exploiting peaceful applications of nuclear energy to the benefit of mankind while preventing the proliferation of nuclear weapons. IAEA safeguards play a central role in this regime, as an independent instrument for verifying States' compliance with their obligations under safeguards agreements. The IAEA's authority to apply safeguards stems from Article III.A.5 of *The IAEA Statute* [8].

Each non-nuclear-weapon State (NNWS) party to the NPT is required pursuant to Article III to conclude a CSA with the IAEA. All existing nuclear weapon-free zone treaties also obligate the parties to them to conclude CSAs with the IAEA.

In February 1992, the IAEA's Board of Governors affirmed that the scope of CSAs was not limited to nuclear material actually declared by a State, but included any material that is required to be declared. Expressed differently, the Board confirmed that the IAEA has the right and obligation, under such agreements, to verify not only that State declarations of nuclear material subject to safeguards are 'correct' (i.e. they accurately describe the types and quantities of the State's declared nuclear material holdings), but that they are also 'complete' (i.e. that they include all material that should have been declared).

² The Article numbers for each CSA can differ. A State that had concluded a safeguards agreement with the IAEA before it concluded a CSA will have an additional article which provides for the suspension of application of safeguards under previous safeguards agreements. This Article is not included for a State that had not concluded safeguards agreements prior to the conclusion of a CSA. The paragraph numbers used in this Guidance are associated with those in INFCIRC/153 (Corrected), which contains the additional paragraph, i.e., paragraph 24 on suspension of application of IAEA safeguards under other agreements.

Soundly-based safeguards conclusions regarding ‘completeness’ for States with CSAs in force depend on the extent to which the IAEA is equipped to detect undeclared nuclear material and activities in such States. Although the IAEA has the authority, under CSAs, to verify the absence of undeclared nuclear material and activities, the tools available under such agreements to do so are limited. This set the stage for safeguards strengthening efforts resulting in the approval by the Board of Governors in May 1997 of the Model AP. An AP provides the IAEA, on a more routine basis, with important supplementary information and access which significantly increase its ability to verify the peaceful use of all nuclear material in the State.

The drawing of soundly-based safeguards conclusions is of the utmost importance to the IAEA. To this end, the Secretariat has continued to develop the State-level concept for the planning, implementation and evaluation of safeguards. The State-level concept applies to all States and involves a comprehensive State evaluation and State-level safeguards approach, including the identification of specific safeguards measures for each State, implemented through an annual implementation plan. The concept of considering the State as a whole enables State-specific factors to be taken into consideration at all stages of safeguards implementation.

The Secretariat’s safeguards conclusions are based upon an evaluation of all information available to the IAEA. Key to the process by which safeguards conclusions are drawn and the requisite verification activities are determined is the State evaluation process. This is a dynamic, iterative process in which the State evaluation results constitute the basis for planning safeguards activities, assessing their results and identifying any follow-up actions (e.g. additional information collection/analysis or verification activities) required for drawing soundly-based safeguards conclusions. By being responsive to changes, the implementation of the State-level concept ensures that the assurances provided to the international community remain credible and up-to-date. All information regarding a State’s nuclear programme, including feedback from inspection-related activities, is evaluated, not only to draw safeguards conclusions, but also to determine the safeguards activities to be conducted with respect to that State in order to maintain those conclusions. This helps the IAEA to customize and focus its verification activities in the field and at Headquarters.

A detailed description of IAEA safeguards, including the continued evolution of the State-level concept and further discussion of drawing soundly-based safeguards conclusions, is provided on the IAEA website.

2.2. The basic undertaking of the State

As mentioned in Section 1, each NNWS party to the NPT is required to conclude a CSA with the IAEA based on INFCIRC/153. The basic undertaking of the State pursuant to a CSA is defined in paragraph 1 of INFCIRC/153:

INFCIRC/153 Paragraph 1

The Agreement should provide that the State [shall] accept safeguards, in accordance with the terms of the Agreement, on all source or special fissionable material in all peaceful nuclear activities within its territory, under its jurisdiction or carried out under its control anywhere, for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or other nuclear explosive devices.

A State may also have a standard SQP or a ModSQP to their CSA. Pursuant to the 2005 Board of Governors decision, all States with standard SQPs are encouraged to accept the

ModSQP through an exchange of letters with the IAEA³. In addition to fulfilling the obligations set out in Part I of a CSA which are not held in abeyance, States with a ModSQP are required to:

- 1) Submit to the IAEA an initial report on all nuclear material which is subject to safeguards, and subsequent updates to the report,
- 2) Submit to the IAEA early design information, and
- 3) Allow for IAEA inspections in the State.

The Model AP equips the IAEA with additional tools that provide, on a more routine basis, broader access to information and locations needed to provide credible assurance of the absence of undeclared nuclear material and activities in a State. Table I indicates the sections of the Guidance which are relevant to States with a ModSQP, and those which are relevant to INFCIRC/540.

Table I. MATRIX OF SECTION CONTENT WITH CSA, MODSQP AND AP REQUIREMENTS

Topic/Section	CSA without SQP	CSA with ModSQP	AP
State Safeguards Infrastructure (Ch. 3)	✓	✓	✓
Nuclear Material Inventory Report (4.2.1)	✓	✓	
Pre 34(c) Material (4.2.2)			✓
Exempted Material (4.2.3)			✓
Facility Design Information (5.1)	✓	✓	
Changes to Facility Design or Operations (5.2)	✓		
Information on LOFs (5.3)	✓	✓	
Information on Sites (5.4)			✓
Operational Activities at Facilities and LOFs (5.5)			✓
Facility Specific Health and Safety (5.6)	✓		
Initial and Updated AP Declarations (6)			✓
Updates to Nuclear Material Information - Inventory Change Reports and Material Balance Reports (7.1)	✓		
Termination of Safeguards (7.2)	✓	✓	✓
Exemption from Safeguards (7.3)	✓	✓	✓
Imports and Exports of pre-34(c) Material (7.4)	✓	✓	✓
International Transfers of Nuclear Material (7.5)	✓	✓	
Non-Application of Safeguards (7.6)	✓	✓	
Special Reports, Amplifications, Clarifications (8)	✓	✓	✓
Provision of Access for Design Information Examination and Verification (9.1)	✓		
Inspections (9.2)	✓	✓	
Ad Hoc Inspections (9.2.1)	✓	✓	
Routine Inspections (9.2.2)	✓		
Special Inspections (9.2.3)	✓	✓	
Complementary Access (9.3)			✓
Limitations or Extensions of Access (9.4)	✓	✓	✓
IAEA Rights and Obligations (10)	✓	✓	✓
Shared Responsibilities (11)	✓	✓	✓

Some CSAs have protocols that clarify or amplify the provisions of the agreement, such as a suspension protocol, which suspends the application of safeguards pursuant to prior

³ Instructions on this process are provided in *Non-Proliferation of Nuclear Weapons and Nuclear Security – Overview of Safeguards Requirements for States with Limited Nuclear Material and Activities*, Vienna, Austria (2005).

agreements concluded between the IAEA and the State for as long as the CSA remains in effect. A cooperation protocol describes the cooperation between parties, such as the IAEA and EURATOM, in carrying out activities pursuant to the agreement. The protocols to a CSA may affect the implementation of some of the provisions of the agreement, and each SRA should have a thorough understanding of its specific agreement and the applicable protocols.

Subsidiary Arrangements are concluded between the IAEA and the State to detail the procedures for implementing the provisions specified in a CSA or AP. Subsidiary Arrangements to a CSA apply to the State as a whole and consist of a General Part applicable to all nuclear activities in the State and a facility or location outside facility (LOF⁴) attachment prepared for each facility or LOF in the State. Subsidiary Arrangements to CSAs, therefore, can vary from State to State, and the conclusion of Subsidiary Arrangements does not require Board approval. In this Guidance, references to requirements associated with Subsidiary Arrangements to a CSA are taken from the model text developed by the IAEA [7]. Subsidiary Arrangements to an AP may be concluded as necessary, but in their absence, the procedures defined in the protocol itself are implemented. Subsidiary Arrangements are to be negotiated during or soon after the entry into force of a CSA or the rescission of an SQP. It should be noted that, for a State with an SQP, the requirement to conclude Subsidiary Arrangements to a CSA is not held in abeyance, but the requirement regarding timing for entry into force is held in abeyance. Any State with an SQP may conclude Subsidiary Arrangements with the IAEA.

INFCIRC/153 Paragraph 39 (Standard and ModSQP)

The Agreement should provide that the Agency and the State shall make Subsidiary Arrangements which shall specify in detail, to the extent necessary to permit the Agency to fulfil its responsibilities under the Agreement in an effective and efficient manner, how the procedures laid down in the Agreement are to be applied. Provision should be made for the possibility of an extension or change of the Subsidiary Arrangements by agreement between the Agency and the State without amendment of the Agreement

INFCIRC/153 Paragraph 40

It should be provided that the Subsidiary Arrangements shall enter into force at the same time as, or as soon as possible after, the entry into force of the Agreement. The State and the Agency shall make every effort to achieve their entry into force within 90 days of the entry into force of the Agreement, a later date being acceptable only with the agreement of both parties. The State shall provide the Agency promptly with the information required for completing the Subsidiary Arrangements. The Agreement should also provide that, upon its entry into force, the Agency shall be entitled to apply the procedures laid down therein in respect of the *nuclear material* listed in the inventory provided for in paragraph 41 below.

INFCIRC/540 Article 13

- a. Where [the State] or the Agency indicates that it is necessary to specify in Subsidiary Arrangements how measures laid down in this Protocol are to be applied, [the State] and the Agency shall agree on such Subsidiary Arrangements within ninety days of the entry into force of this Protocol or, where the indication of the need for such Subsidiary Arrangements is made after the entry into force of this Protocol, within ninety days of the date of such indication.
- b. Pending the entry into force of any necessary Subsidiary Arrangements, the Agency shall be entitled to apply the measures laid down in this Protocol.

2.3. The basic undertaking of the IAEA

The basic undertaking of the IAEA under a CSA is stated in paragraph 2 of INFCIRC/153, and paragraph 7 requires the IAEA to independently reach its safeguards conclusions. IAEA verification activities may include, among other things, use of IAEA-approved equipment for measurements and monitoring, assuring authenticity of safeguards data, installation of IAEA

⁴ A LOF is a location that is not a facility and that customarily uses nuclear material in amounts less than one effective kilogram. A LOF is a physical location such as a hospital, university or factor.

equipment at facilities, application of seals to IAEA equipment used and stored at facilities, analysis of environmental and nuclear material samples at IAEA laboratories, and verification of the functioning and calibration of equipment using certified reference materials (such as weight standards or enrichment standards).

INFCIRC/153 Paragraph 2

The Agreement should provide for the Agency's right and obligation to ensure that safeguards will be applied in accordance with the terms of the Agreement on all source or special fissionable material in all peaceful nuclear activities within the territory of the State, under its jurisdiction or carried out under its control anywhere, for the exclusive purpose of verifying that such material is not diverted to nuclear weapons or other nuclear explosive devices.

INFCIRC/153 Paragraph 7

... The Agency's verification shall include, inter alia, independent measurements and observations conducted by the Agency in accordance with the procedures specified in Part II below. ...

2.4. Safeguards objectives

The IAEA is obligated to achieve certain objectives relevant to each type of safeguards agreement. The overall safeguards objective of a CSA is defined in paragraph 28 of INFCIRC/153.

INFCIRC/153 Paragraph 28

The Agreement should provide that the objective of safeguards is the timely detection of diversion of significant quantities of *nuclear material* from peaceful nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devices or for purposes unknown, and deterrence of such diversion by the risk of early detection.

The 'timely detection' of the diversion of 'significant quantities' is based on the premise that, if a certain quantity of fissile nuclear material cannot be accounted for, the possibility of the State manufacturing a nuclear explosive device cannot be excluded. Also, a certain length of time is required for the State to convert nuclear material into a weapon-usable form. Goal quantities and timeliness requirements are established for detecting diversion of different categories and forms of nuclear material (e.g., low-enriched uranium and high-enriched uranium; bulk form or fresh reactor fuel assemblies).

If the overall objective of a CSA is to be achieved, a second objective must be pursued, namely the detection of undeclared nuclear material and activities in a State. This requires different tools from those needed for the timely detection of the diversion of declared nuclear material, such as a broader range of information, more emphasis on the evaluation of information, more access for inspectors to locations and a more analytical approach in implementing safeguards. It also requires the evaluation of the entire nuclear fuel cycle and related technical capabilities of a State (i.e. the State 'as a whole') in addition to individual facilities.

Therefore, the IAEA has established three generic safeguards objectives that are common to all States with CSAs, as shown below:

- (A) To detect any diversion of declared nuclear material at facilities and LOFs;
- (B) To detect any undeclared production or processing of nuclear material at declared facilities or LOFs; and,
- (C) To detect any undeclared nuclear material or activities in the State as a whole.

To address the generic objectives for a State, the IAEA establishes technical safeguards objectives (hereinafter referred to as technical objectives) to guide the planning, conduct and evaluation of safeguards activities for that State. The technical objectives, which remain within the scope of the State's safeguards agreement, form the basis for identifying safeguards measures and conducting safeguards activities for a State. They may differ from State to State, depending on, for example, the nuclear fuel cycle and related technical capabilities of the State. The technical objectives are established through the conduct of an acquisition path analysis.

The concept of considering the State as a whole provides the opportunity to focus verification efforts and resources where needed to meet the State-specific objectives. The methodology and approach are based on a comprehensive State evaluation that takes State-specific factors into consideration in all stages of safeguards implementation. The technical capabilities of a State's SSAC (or RSAC) and the ability of the IAEA to implement certain safeguards measures in the State are important factors. The adaptability of the State level concept – to focus verification efforts in an optimized way – provides benefits to States and the IAEA by maintaining effectiveness while realizing efficiencies at all stages of safeguards implementation.

2.5. Cooperation between the State and the IAEA

Effective cooperation between the State and the IAEA in safeguards implementation is obligatory, as specified in paragraph 3 of INFCIRC/153, but also beneficial to both parties. Cooperation provides opportunities for important advancements, such as research and development to improve safeguards technology, support programmes through which safeguards technologies can be tested and deployed, and implementation of 'safeguards by design' principles [9, 10]. States' efforts to facilitate the inspectors' ability to complete their activities, both in the field and at Headquarters, in a timely and efficient manner are important and valued by the IAEA, and may also reduce facility operator and SRA efforts.

The IAEA and the SRA should work together to reduce duplication of efforts, minimize errors, avoid miscommunication and implement effective procedures for the submission of information and the conduct of IAEA activities in the field. Technological advancements, such as secure unattended transmission of data from installed equipment, can achieve efficiencies through cooperation. Another example is the use, with IAEA verification based on a random sampling of an SSAC/RSAC inspectorate's and/or SRA's findings. The need for the IAEA to avoid duplication of the State's accounting and control activities while maintaining its capability to perform independent measurements and observations and to draw soundly based safeguards conclusions, is emphasized in paragraph 31 of INFCIRC/153.

INFCIRC/153 Paragraph 3

The Agreement should provide that the Agency and the State shall co-operate to facilitate the implementation of the safeguards provided for therein.

INFCIRC/153 Paragraph 7

The Agreement should provide that the State shall establish and maintain a system of accounting for and control of all *nuclear material* subject to safeguards under the Agreement, and that such safeguards shall be applied in such a manner as to enable the Agency to verify, in ascertaining that there has been no diversion of *nuclear material* from peaceful uses to nuclear weapons or other nuclear explosive devices, findings of the State's system. The Agency's verification shall include, inter alia, independent measurements and observations conducted by the Agency in accordance with the procedures specified in Part II below. The Agency, in its verification, shall take due account of the technical effectiveness of the State's system.

INFCIRC/153 Paragraph 31

The Agreement should provide that pursuant to paragraph 7 above the Agency, in carrying out its verification activities, shall make full use of the State's system of accounting for and control of all *nuclear material* subject to safeguards under the Agreement, and shall avoid unnecessary duplication of the State's accounting and control activities.

3. STATE SAFEGUARDS INFRASTRUCTURE

The State's safeguards infrastructure is built upon the foundation of a State and/or regional legislative and regulatory system, providing for oversight and management of nuclear material and activities. States support IAEA safeguards implementation through effective cooperation with the IAEA and by adequately addressing three fundamental areas:

- 1) Establishment of laws, regulations and a system of accounting for and control of nuclear material at the national/regional level, which ensure that the requirements of the safeguards agreement and associated protocols and Subsidiary Arrangements are fully met;
- 2) Provision of timely, correct and complete reports and declarations to the IAEA; and
- 3) Provision of support and timely access to the IAEA to locations and information necessary to achieve safeguards objectives.

This section of the Guidance discusses the establishment of the State infrastructure to support IAEA safeguards implementation.

3.1. Establishing the State safeguards regulatory infrastructure

States implement non-proliferation obligations by enacting laws and regulations which establish requirements regarding nuclear material possession, handling, use, import and export. While not an exhaustive list, the State's legal framework must address the elements listed below. The order in which these actions are taken may vary from State to State.

- The enactment of laws and regulations to control and oversee the use of nuclear material and nuclear-related activities in the State, consistent with the State's obligations under its safeguards agreement;
- The assignment of responsibilities for safeguards activities and the granting of legal authority to perform them, to an independent SRA;
- The design and implementation of an effective SSAC or RSAC;
- The creation of an effective communication mechanism, including a point of contact, between the IAEA and the State; and
- The implementation of procedures and practices necessary to facilitate information gathering, timely reporting and in-field verification.

An AP significantly increases the IAEA's access to information and locations in the State. In order to meet those broader obligations, the State oversight and control functions may need to be expanded. The governmental entities responsible for overseeing activities reportable under the AP may be different from the entity responsible for implementing the CSA. For example, an Education Ministry may oversee nuclear fuel cycle-related research not involving nuclear material carried out at universities – an activity reportable under the AP. A Ministry responsible for Natural Resources or Energy may regulate uranium and thorium mining, and determine national plans and policies for nuclear fuel cycle development, all relevant to AP declarations. In some cases, a regional safeguards authority may be responsible for

implementation of the CSA, while the State assigns responsibility for matters relating to the AP to a national governmental entity.

In any case, it is necessary for each State's SRA to develop legally enforceable and effective communication and coordination channels with other ministries and entities as necessary to compile and submit complete and accurate declarations and reports, and to effectively facilitate and host inspections, visits and complementary access. More detailed information on declarations submitted under an AP can be found in the IAEA publication, *Guidelines for Preparation and Submission of Declarations Pursuant to Articles 2 and 3 of the Model Protocol Additional to Safeguards Agreements* [11].

The SRA, whether State or regional, should accomplish the following three functions.

1. Regulate and control all nuclear activities in the State for the purpose of assuring that the nuclear material is used only for peaceful purposes, and:
 - maintain awareness of and oversight over all nuclear material subject to safeguards in the State, imported into the State, and exported from the State,
 - account for and control nuclear material,
 - manage information on nuclear facilities and LOFs,
 - manage information on other nuclear fuel cycle-related activities, non-nuclear material, equipment, technology and trade (for States with an AP);
2. Provide correct and complete information, on time, to the IAEA, as required, on:
 - nuclear material (forms, amounts, flows, locations, uses and transfers),
 - nuclear facilities and LOFs,
 - nuclear fuel cycle-related activities and their locations, including research, mining, waste processing, equipment manufacturing, trade and nuclear development plans (for States with an AP);
3. Facilitate IAEA activities to confirm or verify the information provided, and resolve questions and inconsistencies, through institutional arrangements, and by providing access to:
 - nuclear facilities and LOFs during all of their lifecycle stages,
 - any other location where nuclear material is present,
 - any place on a site (for States with an AP),
 - locations of nuclear fuel-cycle-related activities (for States with an AP),
 - other locations as requested by the IAEA pursuant to the agreements.

States may also voluntarily provide information and/or access to the IAEA, beyond that which is required under the agreements and protocols. For example, in 1993, the Board of Governors approved a 'universal reporting scheme,' (now called the 'Voluntary Reporting Scheme'), described in GOV/2629. This arrangement provides a mechanism for States to report information about imports and exports of nuclear material beyond what is required under safeguards agreements, and certain equipment, non-nuclear material and technologies. States may also provide information and access to the IAEA voluntarily, beyond what is required under a safeguards agreement or an AP. The information provided pursuant to an AP need

not be repeated under the VRS, but certain information, such as the reporting of exports of pre-34(c) material for nuclear purpose to NWSs, is not required under an AP and therefore should continue to be reported under the VRS. Once a State commits to provide information under the VRS, the IAEA expects the State to continue doing so.

States in the early phases of developing their safeguards infrastructure should consider a holistic approach, as recommended in the IAEA Nuclear Energy Series document *Milestones in the Development of a National Infrastructure for Nuclear Power* [12]. This approach advocates early planning and preparation, coordination among the various stakeholders to address issues related to safety, security and safeguards, and establishment of a dialog with the IAEA early in the process. This proactive approach facilitates cooperation and communication, which can help avoid costly changes in the future.

3.2. State's system of accounting for and control of nuclear material

National law may set forth the regulatory and control framework regarding the peaceful use of nuclear energy, establish definitions, and authorize an entity in the government to be responsible for oversight of nuclear material and related activities.⁵ Regulations are normally established by the SRA to set out specific requirements for implementing the safeguards agreement and any protocols. Every State, including those with an SQP, shall establish and maintain a system of accounting for and control of all nuclear material subject to safeguards under the Agreement.

INFCIRC/153 Paragraph 7

The Agreement should provide that the State shall establish and maintain a system of accounting for and control of all *nuclear material* subject to safeguards under the Agreement, and such safeguards shall be applied in such a manner as to enable the Agency to verify, in ascertaining that there has been no diversion of *nuclear material* from peaceful uses to nuclear weapons or other nuclear explosive devices, findings of the State's system. ...

In order to provide timely, complete and correct information to the IAEA regarding the State's nuclear material, the SRA must establish a system to account for all nuclear material, to control its use and movements and to monitor its import and export. Nuclear material is accounted for within a structure of material balance areas (MBAs), similar to how banks account for money deposited by account holders. The accounting system records the quantity of nuclear material at the beginning of a period, keeps track of additions to the inventory and subtractions from the inventory, and provides a balance at the end of the period. *The Nuclear Material Accounting Handbook* [13] published by the IAEA provides detailed information regarding nuclear material accounting and reporting. The State's reporting obligations and the IAEA's verification activities are designed in such a way as to enable the IAEA to establish and maintain the nuclear material inventory of the State by verifying the reports submitted by the State. A CSA sets out requirements regarding the system of accounting for and control of nuclear material, the records system with which nuclear material reports are generated, and some general requirements which pertain to any nuclear material report.

The agreed MBA structure to be used for IAEA nuclear material reporting and accountancy purposes, and the requirements for the content, format and timing of nuclear material reports, are specified in Subsidiary Arrangements General Parts and Attachments to a CSA. When establishing the MBA structure in a State, the IAEA gives due consideration to the features of

⁵ For detailed information about nuclear law, see the IAEA Handbook on Nuclear Law – Implementing Legislation, 2010. See Section 12 for resources available to assist States in developing a legal and regulatory structure.

the nuclear material accountancy systems as described in the design information for each facility or information for LOFs.

Operators of facilities and LOFs in a State should establish procedures to carry out functions necessary to account for and control nuclear material, such as designating a person responsible for accounting and control, keeping accurate records of nuclear material inventories and transactions, taking samples for analysis, monitoring nuclear material movements in a plant, assuring the quality of measurements⁶ of nuclear material, and taking a physical inventory. Operators should also establish procedures for preparing reports for submission to the SRA, making records and supporting documentation available to inspectors, and facilitating IAEA activities at the facility or LOF.

The State's system should at least provide all information needed to meet the IAEA reporting requirements. The SRA should ensure the quality of facility/LOF operator information before submitting it to the IAEA. In other words, the SRA must receive information from the facilities and LOFs, evaluate its correctness and completeness, and assure it is in the agreed IAEA reporting format, before submitting it on time to the IAEA. In cases where the SSAC/RSAC has established an inspectorate, the conclusions of its inspections may be included in the State's reported findings.

INFCIRC/153 Paragraph 32

The Agreement should provide that the State's system of accounting for and control of all *nuclear material* subject to safeguards under the Agreement shall be based on a structure of *material balance areas*, and shall make provision as appropriate and specified in the Subsidiary Arrangements for the establishment of such measures as:

- (a) A measurement system for the determination of the quantities of *nuclear material* received, produced, shipped, lost or otherwise removed from inventory, and the quantities on inventory;
- (b) The evaluation of precision and accuracy of measurements and the estimation of measurement uncertainty;
- (c) Procedures for identifying, reviewing and evaluating differences in shipper/receiver measurements;
- (d) Procedures for taking a *physical inventory*;
- (e) Procedures for the evaluation of accumulations of unmeasured inventory and unmeasured losses;
- (f) A system of records and reports showing, for each *material balance area*, the inventory of *nuclear material* and the changes in that inventory including receipts into and transfers out of the *material balance area*;
- (g) Provisions to ensure that the accounting procedures and arrangements are being operated correctly; and
- (h) Procedures for the provision of reports to the Agency in accordance with paragraphs 59—69.

Model Subsidiary Arrangements 2-2.1

For measurement: A measurement system for determination of quantities of nuclear material received; produced; shipped; lost; otherwise removed from inventory; or on inventory; together with procedures for the evaluation of precision and accuracy of measurements and the estimation of measurement uncertainty; the taking of a physical inventory; and the evaluation of accumulations of unmeasured inventory and unmeasured losses.

Model Subsidiary Arrangements 2-2.1

For accountancy: Procedures for identifying, reviewing and evaluating differences in shipper/receiver measurement; a system of records and reports showing, for each material balance area, the inventory of nuclear material and the changes in that inventory including receipts into and transfers out of the material balance area; and procedures for the submission of reports to the Agency in accordance with Articles 59-65 and 67-69 of the Agreement.

Model Subsidiary Arrangements 2.1.3

Provisions [are established] to assure correct operation of the accounting procedures and arrangements.

⁶ The IAEA publishes the current International Target Values of uncertainty for measurements of nuclear material in STR-368. The citation to the 2010 version is provided in the References.

INFCIRC/153 Paragraph 55

The Agreement should provide that the system of measurements on which the records used for the preparation of reports are based shall either conform to the latest international standards or be equivalent in quality to such standards.

Reports must be based on a system of records, with which nuclear-related activities and nuclear material transactions and inventories are tracked and reported. Records include both accounting records, which keep track of nuclear material, and operating records, which document the operational status and parameters at the facility/LOF that are important for determining the quantity and composition of the nuclear material inventory. Records must be kept for each MBA.

INFCIRC/153 Paragraph 51

The Agreement should provide that in establishing a national system of accounting for and control of *nuclear material* as referred to in paragraph 7, the State shall arrange that records are kept in respect of each *material balance area*. Provision should also be made that the Subsidiary Arrangements shall describe the records to be kept in respect of each *material balance area*.

INFCIRC/153 Paragraph 52

The Agreement should provide that the State shall make arrangements to facilitate the examination of records by inspectors, particularly if the records are not kept in English, French, Russian or Spanish.

INFCIRC/153 Paragraph 53

Agreement should provide that the records shall be retained for at least five years.

INFCIRC/153 Paragraph 54

Agreement should provide that the records shall consist, as appropriate, of:
 (a) Accounting records of all *nuclear material* subject to safeguards under the Agreement; and
 (b) Operating records for *facilities* containing such *nuclear material*.

Accounting records must address all nuclear material subject to safeguards, and collect information for each MBA so as to permit the determination of the inventory at a point in time (e.g., adjustments, corrections, inventory changes, measurement results). The specific information to be collected in the accounting records is shown below. Useful instructions regarding the system of records are provided in [13].

INFCIRC/153 Paragraph 56

The Agreement should provide that the accounting records shall set forth the following in respect of each *material balance area*:

- (a) All *inventory changes*, so as to permit a determination of the *book inventory* at any time;
- (b) All measurement results that are used for determination of the *physical inventory*; and
- (c) All *adjustments* and *corrections* that have been made in respect of *inventory changes*, *book inventories* and *physical inventories*.

INFCIRC/153 Paragraph 57

The Agreement should provide that for all *inventory changes* and *physical inventories* the records shall show, in respect of each *batch* of *nuclear material*: material identification, *batch data* and *source data*. Provision should further be included that records shall account for uranium, thorium and plutonium separately in each *batch* of *nuclear material*. Furthermore, the date of the *inventory change* and, when appropriate, the originating *material balance area* and the receiving *material balance area* or the recipient, shall be indicated for each *inventory change*.

Operating records include important supporting documentation (e.g., transfer documentation, analytical results) that helps to explain the content of reports and establish the context in which records and reports are analysed. The examination of records and supporting documentation is a fundamental part of nuclear material verification.

INFCIRC/153 Paragraph 58

The Agreement should provide that the operating records shall set forth as appropriate in respect of each

material balance area:

- (a) Those operating data which are used to establish changes in the quantities and composition of *nuclear material*;
- (b) The data obtained from the calibration of tanks and instruments and from sampling and analyses, the procedures to control the quality of measurements and the derived estimates of random and systematic error;
- (c) A description of the sequence of the actions taken in preparing for, and in taking, a *physical inventory*, in order to ensure that it is correct and complete; and
- (d) A description of the actions taken in order to ascertain the cause and magnitude of any accidental or unmeasured loss that might occur.

General requirements which pertain to any reports prepared pursuant to a CSA are provided below. More details regarding reports are provided in Section 4 on the provision of information to the IAEA. The State's infrastructure to support the provision of reports to the IAEA must ensure that these requirements are met. States may submit reports in one of the official languages of the IAEA, or as agreed otherwise in the Subsidiary Arrangements, but English (the working language of the IAEA) is preferable.

INFCIRC/153 Paragraph 59

The Agreement should provide that the State shall provide the Agency with reports as detailed in paragraphs 60—69 in respect of *nuclear material* subject to safeguards thereunder.

INFCIRC/153 Paragraph 60 (mod SQP)

The Agreement should provide that the reports shall be made in English, French, Russian or Spanish, except as otherwise specified in the Subsidiary Arrangements.

INFCIRC/153 Paragraph 61

The Agreement should provide that the reports shall be based on the records kept in accordance with paragraphs 51-58 above, and shall consist, as appropriate, of accounting reports and special reports.

3.3. Providing information to the IAEA

Infrastructure must be established in the State to generate the required reports at each facility or LOF, to assure its quality and integrity, and to submit information to the IAEA in the agreed formats on time in a secure manner. All reports and declarations must be submitted to the IAEA either by mail or through secure electronic communications.

INFCIRC/153 Paragraph 8

The Agreement should provide that, to ensure the effective implementation of safeguards thereunder the Agency shall be provided, in accordance with the provisions set out in Part II below, with information concerning *nuclear material* subject to safeguards under the Agreement and the features of *facilities* relevant to safeguarding such material. ...

An AP also requires information to be provided to the IAEA; Article 2 defines the content of such information, and Article 3 defines the timing for submission of information to the IAEA. These articles are not provided in full in this Section, but are contained in other sections of this Guidance. The infrastructure necessary to collect, format and submit information under an AP must be established by each State, and often involves coordination among many government entities/agencies.

States that have concluded Subsidiary Arrangements to a CSA must provide information to the IAEA on applicable national laws and regulations, the regulatory infrastructure, authorities, procedures and practices employed within the State to address safeguards obligations. The reporting requirements are specified in Model Subsidiary Arrangements section 2.2. This information is necessary for the IAEA to better understand the responsibilities, authority and rights of the SRA, as well as its independence. These factors, among others, are taken into consideration by the IAEA in designing the State-level safeguards approach.

Model Subsidiary Arrangements 2.2

Specifications of information to be provided (as applicable) for each of the items listed under Code 2.1, information is to be provided on:

1. The existing legislation (laws, regulations, general administrative procedures) giving requirements or laying down minimum standards (outlines, and brief extracts of relevant texts, and references); and texts of relevant new laws, regulations or general administrative procedures as soon as possible after promulgation.
2. The organizational unit(s) responsible at facilities and/or nationally, for measurement; accountancy; assurance that the functions ...are carried out correctly.
3. The extent to which each of the organizational units involved has regulatory power; carries out audits; carries out independent measurements.
4. The procedures and techniques followed by each organizational unit in order to meet the requirements or minimum standards...

3.4. State support to facilitate IAEA activities in the State

States must also establish the necessary infrastructure, including requirements, procedures and technical arrangements, to ensure access by IAEA inspectors and technicians and facilitate the receipt and use of their equipment. Likewise, inspectors and technicians must receive the necessary information and support to carry out their activities under both the CSA and the AP. Support may include providing escorts, radiation protection personnel and equipment, technical and operational staff, and training as required. Facilitating IAEA activities is a crucial element of State infrastructure, and establishing effective access and support depends upon well-defined requirements and procedures that should be in place at facilities and other locations in the State.

Inspectors' access may be carried out with advance notification to the State regarding the location and timing for the verification activity, and some routine inspections may be unannounced. To effectively support IAEA activities, facility operators must be notified, make records and reports available, and facilitate the activities of inspectors during their access. In cases where routine inspections are unannounced, the IAEA and the SRA discuss in advance the arrangements for their implementation. Based on those arrangements, the SRA and facility operators must be prepared to accommodate an inspection without advance notice, while still facilitating the tasks of inspectors so that the objectives of the inspection can be met. States have the right to accompany IAEA inspectors during inspections, but in doing so, they must not impose delays or impede IAEA activities.

Under an AP, the IAEA may request complementary access to locations in the State in order to:

- assure the absence of undeclared nuclear material and activities;
- resolve a question or inconsistency relating to information provided by the State;
- confirm the decommissioned status of a facility or location outside facility;
- carry out location-specific environmental sampling; or
- carry out activities at the request of the State pursuant to Article 8 of INFCIRC/540.

INFCIRC/153 Paragraph 9

The Agreement should provide that the State shall take the necessary steps to ensure that Agency inspectors can effectively discharge their functions under the Agreement. ...

INFCIRC/153 Paragraph 84

However, the Agreement should provide that as a supplementary measure, the Agency may carry out without advance notification a portion of the routine inspections pursuant to paragraph 80 above in accordance with the principle of random sampling. ... Similarly the State shall make every effort to facilitate the task of the inspectors.

INFCIRC/540 Article 4

The following shall apply in connection with the implementation of complementary access under Article 5 of

this Protocol:

- a. The Agency shall not mechanistically or systematically seek to verify the information referred to in Article 2; however, the Agency shall have access to:
 - (i) Any location referred to in Article 5.a.(i) or (ii) on a selective basis in order to assure the absence of undeclared *nuclear material* and activities;
 - (ii) Any location referred to in Article 5.b. or c. to resolve a question relating to the correctness and completeness of the information provided pursuant to Article 2 or to resolve an inconsistency relating to that information;
 - (iii) Any location referred to in Article 5.a.(iii) to the extent necessary for the Agency to confirm, for safeguards purposes, [the State]'s declaration of the decommissioned status of a *facility* or of a *location outside facilities* where *nuclear material* was customarily used. ...

INFCIRC/540 Article 5

[The State] shall provide the Agency with access to:

- a.
 - (i) any place on a *site*;
 - (ii) any location identified by [the State] under Article 2.a.(v)-(viii);
 - (iii) any *decommissioned facility* or *decommissioned location outside facilities* where *nuclear material* was customarily used.
- b. Any location identified by [the State] under Article 2.a.(i), Article 2.a.(iv), Article 2.a.(ix)(b) or Article 2.b, other than those referred to in paragraph a.(i) above, provided that if [the State] is unable to provide such access, [the State] shall make every reasonable effort to satisfy Agency requirements, without delay, through other means.
- c. Any location specified by the Agency, other than locations referred to in paragraphs a. and b. above, to carry out *location-specific environmental sampling*, provided that if [the State] is unable to provide such access, [the State] shall make every reasonable effort to satisfy Agency requirements, without delay, at adjacent locations or through other means.

INFCIRC/540 Article 8

Nothing in this Protocol shall preclude [the State] from offering the Agency access to locations in addition to those referred to in Articles 5 and 9 or from requesting the Agency to conduct verification activities at a particular location. The Agency shall, without delay, make every reasonable effort to act upon such a request.

INFCIRC/540 Article 9

[The State] shall provide the Agency with access to locations specified by the Agency to carry out *wide-area environmental sampling*, provided that if [the State] is unable to provide such access it shall make every reasonable effort to satisfy Agency requirements at alternative locations. ...

Inspectors may need access to certain reports, records, supporting documentation and equipment, among other things. Section 9 contains the specific requirements associated with States facilitating IAEA access for verification activities. In terms of infrastructure, States must establish and exercise the authority and requirements necessary to ensure that inspectors have access to information and locations in the State for verification activities, and can carry out all necessary functions to achieve the safeguards objectives.

An important function of a State's infrastructure is to facilitate the import and export of IAEA equipment and samples to and from the State. Inspections can be delayed if IAEA equipment necessary for its in-field activities is delayed by customs clearance procedures. For example, delays can be caused if customs officers expect a payment for taxes or duties, which the IAEA is not required to pay because it is exempt from such fees in accordance with the *Agreement on the Privileges and Immunities of the Agency* [14].

States should establish the necessary legislation to ensure that the IAEA is exempted from import taxes or duties. The SRA should ensure that the IAEA is aware of any notification and documentation requirements associated with such shipments, and should establish clear lines of communication with the relevant governmental authorities in the State to address any issues in a timely fashion.

Likewise, the shipment of IAEA environmental and nuclear material samples requires specific procedures to be followed, for example to ensure that IAEA sample packaging remains unaltered and the integrity is maintained. The SRA and the IAEA must both understand the

requirements, and the SRA should communicate effectively with both the IAEA and other government agencies involved in these processes.

IAEA inspectors and technicians often require the assistance of facility operators to support their safeguards activities. The State is required to facilitate the provision of such assistance. This may include such activities as installing conduit or mounting brackets, aiding in the procurement of services or equipment and assisting in communication (such as providing interpretation).

<p>INFCIRC/153 Paragraph 88 (mod SQP) When inspectors require services available in the State, including the use of equipment, in connection with the performance of inspections, the State shall facilitate the procurement of such services and the use of such equipment by inspectors.</p>
<p>INFCIRC/153 Paragraph 89 (mod SQP) The Agreement should provide that the State shall have the right to have inspectors accompanied during their inspections by representatives of the State, provided that inspectors shall not thereby be delayed or otherwise impeded in the exercise of their functions.</p>

3.5. Outcomes of implementing the required activities

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540
State Safeguards Institutional Infrastructure			
<i>Legal and Regulatory Infrastructure</i>			
Laws and regulations are established and maintained in the State, which designate an independent State or regional authority responsible for safeguards (SRA), grant it rights and authorities, and provide it with adequate human, technical and financial resources to carry out the State's safeguards obligations.	All States with CSAs	7	
Regulatory requirements which set forth authorization/licensing requirements for nuclear material use, possession, licensing, transfer, accounting and control are established and implemented in the State.	All States with CSAs	7	
Compliance with regulatory requirements is evaluated and enforced for all possessors of nuclear material in the State or under its jurisdiction.	All States with CSAs	7	
The quantity, use and location of all nuclear material in the State or under its jurisdiction or control are known by the State/SRA and subject to IAEA safeguards.	All States with CSAs	7	
The possession, use, transfer, import, and export of all nuclear material and other items subject to reporting pursuant to a safeguards agreement and an AP are controlled by the State, facilitating the State's detection of unauthorized activities involving nuclear material and other items subject to regulatory control.	All States with CSAs	7	
All required information is submitted, and the necessary support is provided, to the Agency to facilitate the effective	All States	7	

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540
and efficient implementation of safeguards activities.	with CSAs		
For a State with Subsidiary Arrangements (SA), information is provided to the IAEA on the State's safeguards regulatory authority and the regulatory requirements established in the State to implement its safeguards obligations.	All States with CSAs and SAs	SA 2.2	
<i>State's System of Accounting for and Control of Nuclear Material</i>			
All nuclear material subject to the full safeguards procedures of a CSA is contained in MBAs and complete records are kept and retained for each MBA as required.	States with CSA and no SQP	32, 51, 53	
MBAs are defined such that all nuclear material can be accounted for and IAEA safeguards objectives can be met.	States with CSA and no SQP	32, 56, 58	
Administrative procedures relating to accounting for and control of nuclear material are effectively implemented at all MBAs and are based on a system of reports, records and measurements that permit the tracking of inventory changes and the closing of material balances.	States with CSA and no SQP	56 SA 2-2.1	
Independent audits of records and measurements of nuclear material are conducted as necessary to validate operator records and assure the quality of reports and declarations provided to the IAEA.	States with CSA and no SQP	SA 2.1.3	
The accuracy and precision of measurements conducted to establish nuclear material accountancy values conform or are equivalent to, the latest International Target Values ⁷ for random and systematic errors for destructive and non-destructive assay measurements ⁸ performed on nuclear material.	States with CSA and no SQP	55	
IAEA inspectors are provided with all necessary records and supporting documentation, in the agreed form and language, in accordance with the relevant Facility/LOF Attachment, in a timely manner.	States with CSA and no SQP, or with Mod. SQP	52, 54, 60	
Records contain accurate and complete information about physical inventory, inventory changes, measurement results, measurement uncertainties, and all adjustments and corrections made regarding the above information together with all relevant supporting documentation to aid in evaluation of the records.	States with CSA and no SQP	54, 56, 57 SA 2-2.1	
<i>Infrastructure for Provision of Information to the IAEA</i>			
All required information is submitted, and the necessary support is provided, to the IAEA to facilitate the effective and	All States with CSAs	7	

⁷ International Target Values 2010 for Measurement Uncertainties in Safeguarding Nuclear Materials (IAEA STR-368, November 2010).

⁸ For detailed information regarding measurements of nuclear material, see section 5.2, pages 41-45, of the IAEA Nuclear Material Accounting Handbook [13].

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540
efficient implementation of safeguards activities.			
For a State with Subsidiary Arrangements, information is provided to the IAEA on the State's safeguards regulatory authority and the regulatory requirements established in the State to implement its safeguards obligations.	All States with CSAs and SAs	SA 2.2	
<i>Infrastructure for Facilitating IAEA Activities in the State</i>			
The necessary legal, regulatory and procedural measures are established to facilitate complementary access, announced and unannounced inspections, and inspectors are provided with the necessary information, granted access to locations, and provided with needed support from the State to carry out all necessary safeguards activities without delay.	All States with CSAs	9, 84, 88, 89	4, 5, 9
All relevant nuclear material, instruments and standards are made available to inspectors for verification in a timely manner, and IAEA inspectors are able to observe sample taking, verify that samples are representative, observe instrument calibration and ship samples for analysis in a timely and secure manner.	All States with CSAs	9	
The IAEA is provided with the relevant technical support to carry out activities as necessary, such as installing, repairing and maintaining equipment for independent measurement and containment and surveillance.	States with CSA and no SQP, or with Mod. SQP	88	

4. PROVISION OF INITIAL INFORMATION ON NUCLEAR MATERIAL

4.1. Introduction

The IAEA evaluates a State's entire nuclear programme and fuel cycle – from mining and milling to final disposition. Some information is provided under CSAs, and other information is provided under APs. The timely provision of correct, complete and up-to-date information facilitates the verification process, and enables realization of effective and efficient safeguards which are based on the evaluation of all available information about the State. Highly effective nuclear material accountancy systems which produce up-to-date information regarding nuclear material flows and inventories facilitate the use of measures such as unattended remote monitoring systems and unannounced inspections. Transparency in nuclear activities in a State increases the IAEA's understanding of the nuclear programme, facilitates analysis of its coherence and consistency, and ultimately increases confidence in the conclusions drawn by the IAEA for that State. Taken together, all information provided by the State, and information collected by the IAEA, is evaluated, analysed and used to design a State-specific safeguards approach.

As stated in paragraphs 1 and 2 of INFCIRC/153, States undertake to accept safeguards on *all source or special fissionable material*, and the IAEA is required to ensure that safeguards are applied on all such material. However, the reporting requirements and verification activities differ depending on such factors as form, concentration, purity, quantity and use of such material. Definitions of 'special fissionable material' and 'source material' from INFCIRC/153 and the IAEA Statute Article XX are shown below.

“The term ‘special fissionable material’ means ^{239}Pu ; ^{233}U ; uranium enriched in the isotopes 235 or 233; any material containing one or more of the foregoing; and such other fissionable material as the Board of Governors shall from time to time determine; but the term ‘special fissionable material’ does not include source material.

The term ‘uranium enriched in the isotopes 235 or 233’ means uranium containing the isotopes 235 or 233 or both in an amount such that the abundance ratio of the sum of these isotopes to the isotope 238 is greater than the ratio of the isotope 235 to the isotope 238 occurring in nature.

The term ‘source material’ means uranium containing the mixture of isotopes occurring in nature; uranium depleted in the isotope 235; thorium; any of the foregoing in the form of metal, alloy, chemical compound, or concentrate; any other material containing one or more of the foregoing in such concentration as the Board of Governors shall from time to time determine; and such other material as the Board of Governors shall from time to time determine.”

The term ‘source material’ encompasses material that can be used to produce special fissionable material. Uranium can be enriched in the isotope ^{235}U using a number of technologies, such as gaseous diffusion, gas centrifuge, electro-magnetic or laser based methods. Neutron irradiation of ^{238}U generates ^{239}Pu . Thorium (^{232}Th) produces ^{233}U through neutron irradiation. Natural uranium and thorium concentrates are, for example, source material. It is necessary, in some cases, due to technological development in the nuclear fuel cycle, for States and the IAEA to work together in clarifying what source material in a State meets the conditions of paragraph 34(c) and what source material does not.

The application of all safeguards procedures set out in Part II of INFCIRC/153 is referred to in paragraph 34(c):

INFCIRC/153 Paragraph 34 (mod SQP)

The Agreement should provide that:

... (c) When any *nuclear material* of a composition and purity suitable for fuel fabrication or for being isotopically enriched leaves the plant or the process stage in which it has been produced, or when such *nuclear material*, or any other *nuclear material* produced at a later stage in the nuclear fuel cycle, is imported into the State, the *nuclear material* shall become subject to the other safeguards procedures specified in the Agreement.

All nuclear material referred to in paragraph 34(c) must be included in the initial report of the State’s nuclear material inventory, as discussed in Section 4.2 below. The IAEA should be consulted in cases where it is unclear whether or not source material meets the conditions of paragraph 34(c). Material containing uranium or thorium which does not meet the conditions of 34(c) is sometimes referred to as ‘pre-34(c)’ material. Both INFCIRC/153 and INFCIRC/540 set out requirements for reporting information regarding pre-34(c) material. These are discussed later in sections 4.2.2 and 7 of this Guidance.

Nuclear material may be used for a nuclear purpose or for a non-nuclear purpose. Nuclear purpose means that the application of the nuclear material uses the nuclear properties of the material. Non-nuclear purpose means that the application does not make use of nuclear properties, but uses other characteristics of the material, such as density, radiation absorption, or conduction.

4.2. Initial information regarding nuclear material

Within 30 days of the end of the last day of the calendar month in which its CSA enters into force, the State must submit its initial report on all nuclear material to the IAEA. The State must also submit design information about facilities, and information about LOFs, within 60 days after its CSA enters into force. When its AP enters into force, the State must submit its required initial declarations to the IAEA within 180 days. The initial AP declarations include information about the State's nuclear material and nuclear fuel cycle which supplements the information submitted under the CSA. Correct and complete AP declarations help to improve the IAEA's understanding of the State's nuclear fuel cycle capabilities and activities – an important part of the comprehensive State evaluation.

This section discusses the requirements for providing information to the IAEA upon entry into force of a CSA and an AP. Section 4.2.1, regarding the initial nuclear material report, is primarily relevant for States modifying or rescinding their SQP, or concluding a CSA (and subsequently submitting their initial report on nuclear material).

4.2.1. Initial nuclear material inventory report

All States with a CSA, including those with an SQP, need to keep an accurate inventory of all nuclear material in the State, or under its jurisdiction or control anywhere. Upon entry into force of a CSA (or after rescinding an SQP or accepting the modified text of an SQP), the State must provide to the IAEA an initial report on all nuclear material subject to safeguards.

The initial report describes the nuclear material and the locations where it exists in the State, and is used by the IAEA to establish and verify the State's initial inventory. The report must be submitted to the IAEA within 30 days of the last day of the calendar month in which the CSA enters into force (or when the modified text of the SQP is accepted, or an SQP is rescinded). The initial report can be submitted as a summarized statement for each facility or LOF, but the IAEA prefers that a physical inventory listing (PIL) format⁹ be used. Once the relevant attachment to the Subsidiary Arrangements has been concluded, the inventory for each MBA is reported to the IAEA using the PIL format.

An important outcome of submitting the initial report is the establishment of a dialog with the IAEA. States should not delay sending in the initial report because of uncertainty regarding its completeness. The IAEA can assist the State in understanding where to look for nuclear material, and corrections or amendments to the initial report can be submitted as the SRA identifies all nuclear material inventories in the State. Likewise, changes to the inventory are reported annually to the IAEA in updates to the initial report¹⁰.

INFCIRC/153 Paragraph 62 (mod SQP)
The Agreement should stipulate that the Agency shall be provided with an initial report on all <i>nuclear material</i> which is to be subject to safeguards thereunder. It should also be provided that the initial report shall be dispatched by the State to the Agency within 30 days of the last day of the calendar month in which the agreement enters into force, and shall reflect the situation as of the last day of that month.
INFCIRC/153 Paragraph 33 (mod SQP)
The Agreement should provide that safeguards shall not apply thereunder to material in mining or ore processing activities.

⁹ The PIL format is R.02/c in the Code 10 of the Subsidiary Arrangements.

¹⁰ A description of the process and the forms for submitting the initial report can be found in the IAEA publication *Non-Proliferation of Nuclear Weapons and Nuclear Security – Overview of Safeguards Requirements for States with Limited Nuclear Material and Activities*.

All nuclear material which meets the conditions of paragraph 34(c) must be included in the initial report, regardless of its use or quantity. However, pursuant to paragraph 33 of INFCIRC/153, safeguards are not applied to nuclear material in mining or ore processing activities, and thus such material need not be included in the initial report.

4.2.2. Initial AP declaration of inventories of pre-34(c) material

To provide the IAEA with a more complete picture of the State's nuclear programme, an AP requires information to be submitted on holdings of pre-34(c) material at a single location, whether intended for nuclear or non-nuclear end use, that is not yet in a non-nuclear end use form, and which exceeds certain quantity thresholds (specific conditions are provided below).

Information also must be provided about pre-34(c) material in smaller quantities at different locations, regardless of its intended use, if the aggregate of material in the State as a whole exceeds the thresholds specified in Article 2.a.(vi)(a) of INFCIRC/540. INFCIRC/540 does not envision the use of detailed nuclear material accountancy in order to generate the information submitted on this source material, which means that rounded figures and estimates of quantities may be provided.

For example, a heavy metals fabrication company may possess several hundreds of tonnes of pre-34(c) uranium oxide to be used in ceramics manufacturing (a non-nuclear end use). The oxide is feed material for a process and therefore not yet in its non-nuclear end use form, and the quantity of uranium exceeds ten metric tonnes, so information about this uranium must be declared.

INFCIRC/540 Article 2

a. [The State] shall provide the Agency with a declaration containing:

(vi) Information regarding *source material* which has not reached the composition and purity suitable for fuel fabrication or for being isotopically enriched, as follows:

- (a) The quantities, the chemical composition, the use or intended use of such material, whether in nuclear or non-nuclear use, for each location in [the State] at which the material is present in quantities exceeding ten metric tons of uranium and/or twenty metric tons of thorium, and for other locations with quantities of more than one metric ton, the aggregate for [the State] as a whole if the aggregate exceeds ten metric tons of uranium or twenty metric tons of thorium. The provision of this information does not require detailed *nuclear material* accountancy;

it being understood that there is no requirement to provide information on such material intended for a non-nuclear use once it is in its non-nuclear end-use form.

INFCIRC/540 Article 3

a. [The State] shall provide to the Agency the information identified in Article 2.a. (vi)(a) within 180 days of the entry into force of this Protocol.

4.2.3. Initial AP declaration of inventories of nuclear material exempted from safeguards

It is possible that a State's AP enters into force some years after concluding a CSA and implementing safeguards thereunder. In this case, nuclear material exempted from safeguards may exist in the State. The initial AP declaration requires information to be provided to the IAEA regarding nuclear material which has been exempted from safeguards. All nuclear material which has been exempted under paragraph 37 of INFCIRC/153 (exemption based on quantity) must be reported. Nuclear material exempted under paragraph 36(b) of INFCIRC/153 (exemption based on use) must also be reported if it is not yet in a non-nuclear end use form, and exceeds the quantity thresholds specified in paragraph 37 of INFCIRC/153.

For example, a university may possess 35 grams of uranium enriched to 40% of the isotope ²³⁵U which has been exempted based on quantity and is used for fuel experiments. This material must be declared because it was exempted based on quantity. A company which manufactures gamma shielding may have 21 500 kg of depleted uranium on inventory as feed material for its manufacturing process which has been exempted based on use. Because the quantity exceeds twenty metric tonnes, and the material is not yet in a non-nuclear end use form, this material must also be declared under the AP.

<p>INFCIRC/540 Article 2.a. [The State] shall provide the Agency with a declaration containing: (vii) (a) Information regarding the quantities, uses and locations of <i>nuclear material</i> exempted from safeguards pursuant to [paragraph 37 of INFCIRC/153]; (b) Information regarding the quantities (which may be in the form of estimates) and uses at each location, of <i>nuclear material</i> exempted from safeguards pursuant to [paragraph 36(b) of INFCIRC/153] but not yet in a non-nuclear end-use form, in quantities exceeding those set out in [paragraph 37 of INFCIRC/153]. The provision of this information does not require detailed <i>nuclear material</i> accountancy.</p>
<p>INFCIRC/540 Article 3 a. [The State] shall provide to the Agency the information identified in Article 2.a.(vii) within 180 days of the entry into force of this Protocol.</p>

4.3. Outcomes of implementing the required activities

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540
Initial Information Regarding Nuclear Material			
A correct and complete initial report is submitted on time, in the agreed format, and includes all nuclear material subject to safeguards. As necessary, corrections or amendments to the initial report are submitted to the IAEA. Annually, updates to the initial report are submitted by States with a Mod SQP to reflect changes in the inventory, as applicable.	States with CSA and no SQP, or with Mod SQP	34(c), 33, 62	
Correct and complete information is provided to the IAEA on time on holdings of pre-34(c) material as provided in INFCIRC/540 Article 2.a.(vi).	AP		2.a. (vi), 3
Correct and complete information is provided to the IAEA on time, on nuclear material exempted from safeguards under INFCIRC/153 paragraph 37, and on nuclear material exempted from safeguards based on use, which is not yet in a non-nuclear end use form and exceeds the thresholds defined in paragraph 37 of INFCIRC/153.	AP		2.a. (vii) a, b; 3

5. PROVISION OF INFORMATION ON LOCATIONS IN THE STATE

States must submit information to the IAEA about locations in the State which are relevant to the State's nuclear programme. The sections below discuss the reporting obligations related to facilities and LOFs, and sites of facilities and LOFs.

5.1. Information on facility design

Upon entry into force of its CSA, a State submits design information on existing facilities during the discussions of the Subsidiary Arrangements, typically within 90 days of entry into force of the CSA. Facility design information is submitted in the form of a design information questionnaire (DIQ). The IAEA examines and verifies the design information to support a number of safeguards activities. The IAEA verifies that facilities are operating in accordance with their stated designs. The IAEA also evaluates the facility, including its function, layout and processes, in order to design an effective safeguards approach to achieve the safeguards objectives. The IAEA determines the specific safeguards measures, and installs and tests safeguards equipment, as required.

For planned facilities, the early provision of design information provides adequate lead time for the IAEA and the SRA to cooperate in preparing for safeguards implementation. All States – those with CSAs, original SQPs and modified SQPs – must notify the IAEA as early as possible regarding plans for a new facility. When a State anticipates building a facility, the preliminary information about the planned facility may be provided to the IAEA in a DIQ or as free text in a letter. The early notification may include only very basic information, such as “two light water reactors, approximately 700 MW each.” As decisions are made about the specific design, additional information should be provided to the IAEA, including the physical location, preliminary design drawings, plant process layouts, etc. The dialog between the IAEA and the State should begin very early in the process of planning to build a nuclear facility. This cooperation allows for features to be incorporated into the facility design which support safeguards implementation, which may save money over the lifetime of the facility operation.

The early provision of preliminary design information is required of all States with CSAs, as described in GOV/2554/Attachment 2/Rev.2 of 1992, entitled *Strengthening of Agency Safeguards – the Provision and Use of Design Information* and noted by the Board in the Chairman’s summary published in GOV/OR.777 in February of 1992. Code 3.1 of the model Subsidiary Arrangements (General Part) was subsequently modified to incorporate the Board’s decision, requiring the early provision of design information for new facilities beginning in the project definition stage, with additional information provided on an iterative basis as the project progresses. States must notify the IAEA as soon as the decision to construct or to authorize construction, whichever is earlier, has been taken. GOV/2554/Attachment 2/Rev. 2 provides useful guidance regarding the kind of information that should be submitted at each stage of the project. The completed DIQ for a new facility must be submitted to the IAEA, based on preliminary construction plans, as early as possible, but not later than 180 days prior to the start of construction.

The IAEA’s right to examine and verify design information extends throughout the lifecycle of the facility – from before construction through to final decommissioning. In the early stages of the project, the IAEA works with the SRA to identify and schedule actions that need to be taken jointly by the State, the facility operator and the IAEA, such as discussing the IAEA’s safeguards approach, installing safeguards equipment and conducting design information examination and verification visits during construction. The IAEA also must perform the necessary budgetary and programme planning. Collaborative planning among the IAEA, the SRA and the operator can lead to significant improvement of the effectiveness and efficiency of safeguards, as well as reductions in the impact on facility operations, especially when new nuclear technologies and new facility types are involved.

DIQ templates for various facility types are available for use by SRAs in submitting preliminary design information. A link to a LOF information template is provided in the

References. A DIQ should be updated as soon as more detailed information is available regarding the facility. Subsidiary Arrangements provide additional information regarding the type of information to provide at each stage in the design and development process. As a DIQ is refined, the IAEA and the State will begin to negotiate the Facility Attachment (FA), which is based on the DIQ. The FA sets out specific details regarding safeguards implementation at the facility.

<p>INFCIRC/153 Paragraph 8 The Agreement should provide that to ensure the effective implementation of safeguards thereunder the Agency shall be provided, in accordance with the provisions set out in Part II below, with information concerning <i>nuclear material</i> subject to safeguards under the Agreement and the features of <i>facilities</i> relevant to safeguarding such material. ...</p>
<p>INFCIRC/153 Paragraph 42 (original SQP) Pursuant to paragraph 8 above, the Agreement should stipulate that design information in respect of existing <i>facilities</i> shall be provided to the Agency during the discussion of the Subsidiary Arrangements, and that the time limits for the provision of such information in respect of new <i>facilities</i> shall be specified in the Subsidiary Arrangements. It should further be stipulated that such information shall be provided as early as possible before <i>nuclear material</i> is introduced into a new <i>facility</i>.</p>
<p>GOV/INF/276/Rev.1 Annex B (mod SQP) I.(3)(b) In order to enable the timely conclusion of the Subsidiary Arrangements provided for in Article 38 of the Agreement, [the State] shall: (a) notify the Agency sufficiently in advance of its having nuclear material in peaceful nuclear activities within its territory or under its jurisdiction or control anywhere in quantities that exceed the limits, as referred to in section (1) hereof, or (b) notify the Agency as soon as decision to construct or to authorize construction of a facility has been taken, whichever occurs first.</p>
<p>INFCIRC/153 Paragraph 43 The Agreement should provide that the design information in respect of each <i>facility</i> to be made available to the Agency shall include, when applicable: (a) The identification of the <i>facility</i>, stating its general character, purpose, nominal capacity and geographic location, and the name and address to be used for routine business purposes; (b) A description of the general arrangement of the <i>facility</i> with reference, to the extent feasible, to the form, location and flow of <i>nuclear material</i> and to the general layout of important items of equipment which use, produce or process <i>nuclear material</i>; (c) A description of features of the <i>facility</i> relating to material accountancy, containment and surveillance; and (d) A description of the existing and proposed procedures at the <i>facility</i> for <i>nuclear material</i> accountancy and control, with special reference to <i>material balance areas</i> established by the operator, measurements of flow and procedures for <i>physical inventory</i> taking.</p>
<p>Model Subsidiary Arrangements 3.1 Note 4. Any facility under construction at the time of entry into force of the safeguards agreement is considered as an existing facility.</p>
<p>Model Subsidiary Arrangements 3.1 3.1.1. Provision of completed Agency design information questionnaire (DIQ) for existing facilities [should be provided] within 60 days of entry into force of the Agreement. 3.1.2. Provision of preliminary design information for new facilities [should be provided] as soon as the decision to construct or to authorize construction has been taken, whichever is earlier. 3.1.3. Provision of further information on designs of new facilities [should be provided] as design is developed. Information to be provided early in the project definition, preliminary design, construction and commissioning phases. 3.1.4. Provision of completed Agency DIQ for new facilities, based on preliminary construction plans [should be provided] as early as possible, and in any event not later than 180 days prior to the start of construction. 3.1.5. Provision of completed Agency DIQ for new facilities, based on “as-built” designs [should be provided] as early as possible, and in any event not later than 180 days before the first receipt of nuclear material at the facility.</p>
<p>INFCIRC/153 Paragraph 44 The Agreement should further provide that other information relevant to the application of safeguards shall be made available to the Agency in respect of each <i>facility</i>, in particular on organizational responsibility for material accountancy and control. It should also be provided that the State shall make available to the Agency supplementary information on the health and safety procedures which the Agency shall observe and with which the inspectors shall comply at the <i>facility</i>.</p>

5.2. Changes to facility design or operations

Facility design changes, or changes in the way operations at facilities are conducted, must be evaluated by the IAEA to determine the effect on the safeguards approach. The IAEA may need to make changes to its safeguards measures, which could involve such activities as installing equipment, or relocating cameras. Therefore, this information must be provided to the IAEA well in advance of making the change, specifically, “as soon as the decision to modify the facility has been taken.” This means that SRAs must establish requirements and procedures for facility operators to monitor the design configuration and notify the SRA when considering modifications to the facility operations, in advance of making substantial changes. Substantial changes which require advance notification to the IAEA are specified in the FA and should be submitted to the IAEA as updates to the DIQ.

INFCIRC/153 Paragraph 45

The Agreement should stipulate that the design information in respect of a modification relevant for safeguards purposes shall be provided for examination sufficiently in advance for the safeguards procedures to be adjusted when necessary.

Model Subsidiary Arrangements 3.1

3.1.6 Provision of information on proposed significant changes to data previously provided under Code 3.1.1 or 3.1.5 including those specified in the Facility Attachment concerned [should be provided] as soon as the decision to modify the facility has been taken.

3.1.7 Provision of information on significant changes to data previously provided under Code 3.1.1 or 3.1.5 including those specified in the Facility Attachment concerned, based on “as-built” data [should be provided] as soon as possible after completion of significant changes.

3.1.8 Provision of information on changes to data previously provided under Code 3.1.1 or 3.1.5 other than changes specified in Code 3.1.6 [should be provided] together with the first inventory change report made after modification is completed.

5.3. Information regarding LOFs

‘Locations outside facilities’ or LOFs are installations or locations which are not facilities, and which customarily use nuclear material in quantities of one effective kilogram or less.¹¹ Information about the characteristics of these locations must be provided to the IAEA and are an important component of State evaluation. Information on existing LOFs must be submitted within 60 days of the entry into force of the CSA. Information about planned LOFs is to be provided to the IAEA as early as possible, but not later than 180 days before the receipt of nuclear material. Information about LOFs includes the geographic location, the use and possessor of the nuclear material, and procedures and organizational responsibility for nuclear material accounting and control. A template is available for reporting information about existing and new LOFs.

States must submit to the IAEA updated information regarding LOFs not later than 30 days after the change occurs. The LOF information template¹² should be used to provide this information to the IAEA. Changes to any previously submitted information, such as the purpose of the LOF, the owner/operator, the operational status or the physical location, must also be reported.

INFCIRC/153 Paragraph 49 (mod SQP)

The Agreement should provide that the following information concerning *nuclear material* customarily used

¹¹ LOFs may be combined into one “catch-all” MBA for a State, in which case, the total inventory or throughput of the MBA is less than one effective kilogram of nuclear material.

¹² The LOF information template can be found at www.iaea.org/ourwork/sv/safeguards.

outside *facilities* shall be provided as applicable to the Agency:

- (a) A general description of the use of the *nuclear material*, its geographic location, and the user's name and address for routine business purposes; and
- (b) A general description of the existing and proposed procedures for *nuclear material* accountancy and control, including organizational responsibility for material accountancy and control.

The Agreement should further provide that the Agency shall be informed on a timely basis of any change in the information provided to it under this paragraph.

Model Subsidiary Arrangements 3.1

3.1.9 Provision of information on existing LOFs [should be provided] within 60 days of entry into force of the Agreement.

3.1.10 Provision of information on new LOFs to which nuclear material is to be transferred [should be provided] as early as possible... not later than 180 days before the receipt of any nuclear material at the location concerned.

3.1.11 Provision of information on changes to data previously provided [regarding LOFs] ...[should be provided] not later than 30 days after the change occurs.

Note 3. For 3.1.9 and 3.1.10, in case of doubt whether a new location should be classified as a facility or a material balance area outside facilities, [the State] should consult with the Agency... as early as possible and ... not later than when the decision has been made to construct or use nuclear material at a new location.

5.4. Information regarding sites

The term 'site' has a specific definition under INFCIRC/540. It includes the areas described in the design information for a facility (or in the information about a LOF), and must include all installations co-located with the facility or LOF, which provide essential services to the facility or LOF. Sites of operating, as well as closed-down, facilities must be declared under an AP. Sites of closed-down LOFs must be declared if the activities at the LOF were related to conversion, enrichment, fuel fabrication or reprocessing. Upon request, States must provide information to the IAEA concerning activities at a particular location (activities which have not been included as part of the site declaration) which the IAEA considers may be functionally related to the activities on the site. To reduce the need for such requests, States should include all installations that are functionally related to the facility or LOF in the site declaration. Generally, a site should be a geographically coherent area. An important component of this declaration is a detailed, annotated map of the site, which clearly indicates the site boundary, scale, orientation and labels the buildings so that they can be matched with each entry in the declaration.

Many buildings on sites directly support nuclear operations, so they are important components of the nuclear fuel cycle capabilities of the State. They are significant to safeguards because they could be readily used for nuclear activities, benefitting from the same infrastructure and expertise available at the site for the declared facility. The ownership or administrative responsibility for each building is not a factor when determining whether a building should be included in the site. It is expected that many sites will contain buildings owned or administered by different parties. It is not required to declare information about historical activities and uses of buildings on sites. However, the IAEA may take environmental samples at all buildings on sites, which may detect the historical use of nuclear material, prompting the IAEA to request the State to provide clarifications or amplifications of the information for that site. Therefore, States may wish to include historical information in the site declaration regarding past use of nuclear material in buildings on sites.

The descriptions of all of the buildings on a site and the activities carried out in them, together with the map of the site, must be reported to the IAEA within 180 days of entry-into-force of an AP. The AP Guidelines (Ref. [11]) provide helpful information about providing declarations on sites. As with all declarations, the SRA is encouraged to consult with the

IAEA in case of uncertainty regarding the definition of the site boundary or any other questions regarding site declarations.

States must submit updated information for each site to the IAEA annually, by the 15th of May, covering changes which occurred during the prior calendar year. In the event that no changes occurred to any sites, States should submit declarations with ‘nothing to declare’ or ‘no change.’

INFCIRC/540 Article 2

a. [The State] shall provide the Agency with a declaration containing:

(iii) A general description of each building on each *site*, including its use and, if not apparent from that description, its contents. The description shall include a map of the *site*.

INFCIRC/540 Article 3

a. Information identified in 2.a.(iii) shall be provided within 180 days of entry into force of the additional protocol.

INFCIRC/540 Article 2

f. [The State] shall make every reasonable effort to provide the Agency with the following information:

(ii) A general description of activities and the identity of the person or entity carrying out such activities, at locations identified by the Agency outside a *site* which the Agency considers might be functionally related to the activities of that *site*.

The provision of this information is subject to a specific request by the Agency. It shall be provided in consultation with the Agency and in a timely fashion.

INFCIRC/540 Article 3

b. [The State] shall provide to the Agency, by 15 May of each year, updates of the information referred to in [2.a.(iii)] above for the period covering the previous calendar year. If there has been no change to the information previously provided, [the State] shall so indicate.

5.5. Operational activities at facilities and LOFs

The IAEA may request information from States with an AP, regarding operational activities of safeguards relevance at facilities and LOFs, which the IAEA expects may be useful in achieving gains in safeguards effectiveness or efficiency. For example, to facilitate scheduling of short-notice, random interim inspections, the State might provide more timely information on nuclear material transfers and inventories. The IAEA and the State must agree regarding the provision of this information by the State, and the timing for submitting it to the IAEA. In addition, there is no standard format for providing this information. If no request has been made by the IAEA for information under Article 2.a.(ii), it is not necessary to submit a declaration stating ‘nothing to declare.’

INFCIRC/540 Article 2

a. [The State] shall provide the Agency with a declaration containing

(ii) Information identified by the Agency on the basis of expected gains in effectiveness or efficiency, and agreed to by [the State], on operational activities of safeguards relevance at *facilities* and at *locations outside facilities* where *nuclear material* is customarily used.

INFCIRC/540 Article 3

f. [The State] and the Agency shall agree on the timing and frequency of the provision of information identified in Article 2.a.(ii).

5.6. Facility-specific health and safety information

States are required under their Subsidiary Arrangements to provide information to help ensure the inspectors are safe and can receive medical treatment as necessary while carrying out their duties in the State. Information on medical facilities and procedures should be provided specific to each facility or location which inspectors may visit.

<p>Model Subsidiary Arrangements 3.2.1 Information on laws and regulations for safety and radiological protection in [the State] as applicable to Agency inspectors [should be provided], initially, on entry into force of the Subsidiary Arrangements. Information on relevant new laws or regulations, or changes [should be provided] as soon as possible after such new laws or regulations have been promulgated or changes introduced.</p>
<p>Model Subsidiary Arrangements 3.2.2 Information on radiological surveillance measures and on medical facilities that are available for Agency inspectors in case of radiation accidents should be provided, initially, on entry into force of the Subsidiary Arrangement.</p>
<p>Model Subsidiary Arrangements 3.2.3 Information on radiation dosages received by Agency inspectors in the performance of their functions in [the State] should be provided quarterly, and as soon as possible after significant radiation exposure.</p>

5.7. Outcomes of implementing the required activities

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540
Provision of Information on Locations in the State			
<i>Initial and Updated Information on Facilities</i>			
Detailed design information is provided on time to the IAEA for each existing facility, using the agreed format, within 60 days of entry into force of the safeguards agreement.	States with CSA and no SQP	42, 43, 44	
The IAEA is notified and preliminary design information is provided about a planned facility as soon as the decision to construct or authorize construction has been taken (whichever is earlier).	All States with CSAs	42, Mod SQP text, SA 3.1	
A Design Information Questionnaire (DIQ) based on preliminary design and construction plans is provided to the IAEA at least 180 days before construction begins. A complete DIQ based on as-built designs is provided to the IAEA at least 180 days before nuclear material is received at a new facility.	States with CSA and no SQP	43	
Information on changes to facility design of operations is provided to the IAEA well in advance of making the change, affording sufficient time for analysis and evaluation, to ensure the effectiveness of the safeguards system at the facility is maintained.	States with CSA and no SQP	45 SA 3.1	
<i>Initial and Updated Information on LOFs</i>			
Complete, correct and timely information on all locations outside facilities (LOFs) in the State is provided to the IAEA upon entry into force of the CSA.	States with CSA and no SQP, or with Mod SQP	49	
Information about a new LOF is provided to the IAEA as early as possible and not later than 180 days before nuclear material is introduced to the LOF.	All States with CSAs	SA 3.1	
Information about LOFs is updated to reflect changes and provided to the IAEA not later than 30 days after the change has occurred.	All States with CSAs	49	

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540
<i>Information on Facilities and LOFs Specified in Subsidiary Arrangements</i>			
As required based on the Subsidiary Arrangements, information is provided to the IAEA for each facility or LOF, on the following topics: organizational responsibility for material accountancy and control; facility-specific health and safety procedures; laws and regulations relevant to inspectors and their radiological protection; and locations where medical services can be provided to inspectors in case of an accident involving radiation.	States with CSA and no SQP	44 SA 3.2	
As required based on the Subsidiary Arrangements, the State provides the IAEA with reports of radiation doses received by inspectors in the performance of their functions in the State, quarterly, and as soon as possible after any significant radiation exposure.	States with CSA and no SQP	SA 3.2	
<i>Initial and Updated Information on Sites</i>			
Complete and accurate descriptions of all sites are provided to the IAEA, including detailed maps of the sites and descriptions of activities conducted in listed buildings, within 180 days of entry into force of an AP.	AP		2.a. (iii); 3
The IAEA receives updated information at least annually (by 15 May) to reflect changes in the structure and use of each site, including an updated map of the site and updated information about activities in buildings on the site, as well as complete and accurate information about all new sites.	AP		2.a. (iii); 3

6. INITIAL AND UPDATED STATE DECLARATIONS OF NUCLEAR FUEL CYCLE-RELATED ACTIVITIES

In addition to information about nuclear material, facilities and LOFs, a State also provides initial declarations under an AP which help the IAEA to evaluate the completeness of a State's declarations. Nuclear capabilities are acquired in two principal ways: 1) national development through research, and 2) import of technology and capability from abroad. The evaluation of the completeness of the State's declarations is based upon an assessment of the consistency between State-provided information and all other information obtained by the IAEA. AP declarations help to broaden the IAEA's understanding of the State's nuclear programme beyond those activities which directly involve nuclear material and include the other nuclear fuel-cycle related activities integral to technological advancement – research and development (R&D), manufacturing and nuclear-related imports and exports. Information provided on imports and exports, and on international partnerships, also helps the IAEA to better understand nuclear capabilities of other States.

All of the initial declarations discussed in this section must be submitted to the IAEA within 180 days after the entry into force of an AP, reflecting the situation in the State as of any date between the date of entry into force and 180 days after entry into force. Updates are due by 15 May covering the previous calendar year.

6.1. Nuclear fuel cycle-related research and development activities not involving nuclear material, and the associated locations

The development of nuclear fuel-cycle capabilities requires R&D that often does not involve the use of nuclear material. Article 2.a.(i) of INFCIRC/540 requires that all nuclear fuel cycle-related R&D activities not involving nuclear material, carried out anywhere, which are funded, specifically authorized or controlled by, or carried out on behalf of the State, must be declared to the IAEA and updated annually.

In addition, Article 2.b.(i) requires States to make “every reasonable effort” to declare information about nuclear fuel cycle-related R&D activities not involving nuclear material, which are not government funded or sponsored, and which are specifically related to enrichment, reprocessing of nuclear fuel or the processing of intermediate or high-level waste containing plutonium, high enriched uranium or ²³³U. In case of doubts about whether to report a specific R&D activity under 2.a.(i) or 2.a.(ii), the SRA should consult with the IAEA.

The information to be submitted regarding nuclear fuel cycle-related R&D activities includes: a description of the research, its objective, the organizations or individuals carrying it out, and its location. There may be instances where the R&D is being carried out at several locations, possibly even in other States or by several organizations. The declaration should include a separate entry for each organization and the locations at which the activities take place, including locations in other States.

INFCIRC/540 Article 2

- a. [The State] shall provide the Agency with a declaration containing:
- (i) A general description of and information specifying the location of *nuclear fuel cycle-related research and development activities* not involving *nuclear material* carried out anywhere that are funded, specifically authorized or controlled by, or carried out on behalf of, [the State].
- b. [The State] shall make every reasonable effort to provide the Agency with the following information:
- (i) A general description of and information specifying the location of *nuclear fuel cycle-related research and development activities* not involving *nuclear material* which are specifically related to enrichment, reprocessing of nuclear fuel or the processing of intermediate or high-level waste containing plutonium, *high enriched uranium* or uranium-233 that are carried out anywhere in [the State] but which are not funded, specifically authorized or controlled by, or carried out on behalf of, [the State]. For the purpose of this paragraph, "processing" of intermediate or high level waste does not include repackaging of the waste or its conditioning not involving the separation of elements, for storage or disposal.

INFCIRC/540 Article 3

- a. [The State] shall provide to the Agency the information identified in Article 2.a.(i) and Article 2.b.(i) ... within 180 days of ...entry into force.

6.2. Nuclear-related activities specified in Annex I of the AP

The processing and use of nuclear material requires equipment and technology, some of which is especially designed for use in the nuclear fuel cycle, while other types are used both for nuclear fuel cycle purposes as well as for other applications. An AP requires the State to declare the scale of operations and the location of activities that are specified in Annex I of INFCIRC/540. These activities involve the manufacture of materials, equipment and systems that are specific to the nuclear fuel cycle. The IAEA compares the scale of operations to the needs of the State and the declared exports to other States, to develop a better understanding of nuclear activities and trade. In the initial AP declaration (which is as of the date of entry into force of an AP) the scale of operations can be described as the total production during the prior twelve months, or the production capacity and the extent to which the capacity is typically utilized. If the activity is located on a site, the declaration should indicate the relevant facility or LOF code. Without prejudice to Article 16 of INFCIRC/540, States may

provide information on activities not specified in Annexes I and II of INFCIRC/540, such as the production of tritium, metallic beryllium and boron-10. An AP provides for voluntary information to be submitted by the State in its AP declarations.

INFCIRC/540 Article 2

a. The State shall provide the Agency with a declaration containing:

(iv) A description of the scale of operations for each location engaged in the activities specified in Annex I to this Protocol.

INFCIRC/540 Article 3

a. [The State] shall provide to the Agency the information identified in Article 2.a.(iv)... within 180 days of ... entry into force.

6.3. Mines and concentration plants

As part of the initial AP declaration, information must be provided regarding operating as well as closed-down uranium mines and uranium and thorium concentration plants. This helps the IAEA to develop an understanding of, among other things, a State's total holdings of nuclear material, its capacity to produce source material, and the coherence between the production levels of uranium or thorium and its use in the State and export out of the State. Mining activities which produce uranium or thorium as a by-product should be declared. Mines which are permanently closed should be declared in the initial declaration indicating their operational status and having a production capacity of zero.

The IAEA may request information about the current annual production of a specific mine or concentration plant, and States must respond to such requests within 60 days of receiving them. If a mine or concentration plant is located on a site, the code for the relevant LOF or facility should be indicated as part of the location. An annotated map showing the locations declared under Article 2.a.(v) is very helpful to the IAEA's evaluation of the information.

INFCIRC/540 Article 2

a. The State shall provide the Agency with a declaration containing:

(v) Information specifying the location, operational status and the estimated annual production capacity of uranium mines and concentration plants and thorium concentration plants, and the current annual production of such mines and concentration plants for [the State] as a whole. [The State] shall provide, upon request by the Agency, the current annual production of an individual mine or concentration plant. The provision of this information does not require detailed *nuclear material* accountancy.

INFCIRC/540 Article 3

a. [The State] shall provide to the Agency the information identified in Article 2.a (v), ... within 180 days of the entry into force of this Protocol.

6.4. Nuclear development plans

Nuclear fuel cycle development is a long-term undertaking, which requires careful planning and consideration. The IAEA evaluation of each State's nuclear programme includes an assessment of the State's activities in the context of its longer term plans. To aid the IAEA in this evaluation, each State is required to submit a declaration of its approved ten-year plan for nuclear fuel-cycle related development, and annual updates. The declaration should reflect the official State plans for nuclear development, as approved by the appropriate authorities in the State¹³.

¹³ The authority is often the government agency responsible for the State's energy production, such as a Ministry of Energy or Ministry of Natural Resources.

INFCIRC/540 Article 2.a.

(x) General plans for the succeeding ten-year period relevant to the development of the nuclear fuel cycle (including planned *nuclear fuel cycle-related research and development activities*) when approved by the appropriate authorities in [the State].

INFCIRC/540 Article 3

a. [The State] shall provide to the Agency the information identified in Article 2.a (x)... within 180 days of the entry into force of this Protocol.

6.5. Exports and imports of specified equipment and non-nuclear material

States may acquire nuclear capability by importing technology and material from abroad. On a quarterly basis, information on exports of items in areas covered by Annex II of INFCIRC/540 is declared to the IAEA under an AP to facilitate the IAEA's understanding of the State's full nuclear programme as well as to provide a more complete picture of nuclear activities in other States. Importing States may be requested by the IAEA to confirm information obtained by the IAEA regarding an export to that State¹⁴. The location where the exported equipment or material is to be used in the receiving State must also be reported by the exporting State.

States may also provide information and access to the IAEA voluntarily, beyond what is required under a safeguards agreement or an AP. An example of voluntary provision of information is the Voluntary Reporting Scheme described in Section 3.1 above.

INFCIRC/540 Article 2

a. The State shall provide the Agency with a declaration containing:

(ix) The following information regarding specified equipment and non-nuclear material listed in Annex II:

(a) For each export out of [the State] of such equipment and material: the identity, quantity, location of intended use in the receiving State and date or, as appropriate, expected date, of export;

(b) Upon specific request by the Agency, confirmation by [the State], as importing State, of information provided to the Agency by another State concerning the export of such equipment and material to [the State]

INFCIRC/540 Article 3

d. [The State] shall provide to the Agency on a quarterly basis the information identified in Article 2.a.(ix)(a). This information shall be provided within sixty days of the end of each quarter.

g. [The State] shall provide to the Agency the information in Article 2.a.(ix)(b) within sixty days of the Agency's request.

6.6. Updates to AP declarations on the State's nuclear fuel cycle-related activities

Every year, States with an AP in force must submit an updated declaration, including information regarding nuclear fuel cycle-related research and development activities not involving nuclear material, manufacturing activities and the State's ten-year plan for nuclear development. Updates to information must also be submitted about the location, operational status and production capacity of uranium mines and uranium and thorium concentration plants. Essentially everything provided in the initial AP declaration must be updated, and any new reportable activities that occurred during the previous year must be declared in the update. If a State has nothing to declare under a particular article, the State should indicate this by stating 'nothing to declare' for that line of the declaration. The updated AP declaration must be submitted by 15 May for the period covering the previous calendar year.

¹⁴ If the IAEA has not requested information to be submitted in a particular quarter, the State need not submit a declaration for Article 2.a.(ix)(b) of INFCIRC/540.

For declarations of Annex I activities under 2.a.(iv), if a location ceases to carry out Annex I activities, a final declaration to this effect should be submitted, and no additional declarations are needed unless Annex I activities recommence.

INFCIRC/540 Article 3.b.

[The State] shall provide to the Agency, by 15 May of each year, updates of the information identified in Article 2.a.(i), (iii), (iv), (v), (vi)(a), (vii) and (x) and Article 2.b.(i), for the period covering the previous calendar year. If there has been no change to the information previously provided, [the State] shall so indicate.

6.7. Outcomes of implementing the required activities

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540:
Initial and Updated State Declarations of Nuclear Fuel Cycle-Related Activities			
Complete, timely and correct information is provided to the IAEA regarding the State’s nuclear fuel-cycle related research and development activities not involving nuclear material, the scale of operations for each location engaged in activities specified in Annex 1 of INFCIRC/540, and nuclear development plans, at a level of detail useful for evaluation of coherence and internal consistency, and consistency with all other information obtained by the IAEA.	AP		2.a.(i), (iv), (x) 2.b.(i), 3
Complete, timely and correct information is provided to the IAEA regarding all uranium mines, and uranium and thorium concentration plants, and their status.	AP		2.a.(v), 3
Complete, timely and correct information is provided to the IAEA on all exports of items listed in Annex II to the INFCIRC/540, on a quarterly basis. Within 60 days of receiving a request from the IAEA, information regarding imports of Annex II items is provided to the IAEA.	AP		2.a.(ix), 3
Complete and correct updates to declarations on the relevant R&D activities [2.a.(i), 2.b.(i)], manufacturing activities [2.a.(iv)], uranium mining and uranium and thorium concentration plants [2.a.(v)] and plans for nuclear development [2.a.(x)] are submitted by 15 May each year for the period covering the previous calendar year, enabling the IAEA’s evaluation of the continued coherence, internal consistency and consistency with other information available to the IAEA.	AP		2.a.(i), (iv), (v), (x), 3.b.
The IAEA receives a complete declaration from the State including each relevant article, with updated information, ‘nothing to declare’ or ‘no change’ indicated as appropriate.	AP		3

7. NUCLEAR MATERIAL INVENTORY CHANGES, EXPORTS AND IMPORTS

The initial information provided by States helps the IAEA to establish the inventory of nuclear material and to evaluate the State’s nuclear programme. Updates to the initial information must be submitted to the IAEA to facilitate on-going verification and evaluations. The submission of correct, timely, complete and up-to-date information facilitates the use of measures such as random, unannounced inspections and remote monitoring, and may also

help reduce the instances of questions or inconsistencies in AP declarations. Updates must be provided for all of the initial information provided by the State.

7.1. Inventory changes and material balance reports

The nuclear material inventory in some facilities is continuously changing as material moves through the facility, changing location and sometimes form and concentration. The inventory also changes as material is transferred from one MBA to another, imported from abroad or exported out of the State. These changes are reported to the IAEA in ‘inventory change reports.’ Techniques to increase safeguards effectiveness and efficiency, such as unannounced inspections and unattended monitoring systems, require inventory changes to be tracked and recorded very accurately and frequently, so that reports can be provided to inspectors upon arrival, which reflect the actual situation at the facility.

Physical inventory taking of the nuclear material in an MBA validates the information in the accounting records and incorporates a process to detect and resolve differences, called ‘closing a material balance.’ When the physical inventory is taken, all nuclear material present in the MBA (or a statistically valid sampling of that material which is representative of the entire inventory) is counted and measured, and the results are compared to the inventory according to the nuclear material accounting records (known as the ‘book inventory’). Differences between the two are evaluated; in facilities with material in bulk form, some differences are expected due to processing of the material and measurement uncertainties, but statistically significant differences may indicate loss, theft or diversion of nuclear material and must be investigated and resolved. The results of the material balance evaluation process are submitted in the ‘material balance report,’ accompanied by the results of physical inventory taking in the PIL.

INFCIRC/153 Paragraph 63

The Agreement should stipulate that for each *material balance area* the State shall provide the Agency with the following accounting reports:

- (a) *Inventory change* reports showing changes in the inventory of *nuclear material*. The reports shall be dispatched as soon as possible and in any event within 30 days after the end of the month in which the *inventory changes* occurred or were established; and
- (b) Material balance reports showing the material balance based on a *physical inventory* of *nuclear material* actually present in the *material balance area*. The reports shall be dispatched as soon as possible and in any event within 30 days after the *physical inventory* has been taken.

The reports shall be based on data available as of the date of reporting and may be corrected at a later date as required.

INFCIRC/153 Paragraph 64

The Agreement should provide that the *inventory change* reports shall specify identification and *batch data* for each *batch* of *nuclear material*, the date of the *inventory change* and, as appropriate, the originating *material balance area* and the receiving *material balance area* or the recipient. These reports shall be accompanied by concise notes:

- (a) Explaining the *inventory changes*, on the basis of the operating data contained in the operating records provided for under subparagraph 58(a) above; and
- (b) Describing, as specified in the Subsidiary Arrangements, the anticipated operational programme, particularly the taking of a *physical inventory*.

INFCIRC/153 Paragraph 65

The Agreement should provide that the State shall report each *inventory change*, *adjustment* and *correction* either periodically in a consolidated list or individually. The *inventory changes* shall be reported in terms of *batches*; small amounts, such as analytical samples, as specified in the Subsidiary Arrangements, may be combined and reported as one *inventory change*.

INFCIRC/153 Paragraph 67

The Agreement should provide that the material balance reports shall include the following entries, unless otherwise agreed by the Agency and the State:

- (a) Beginning *physical inventory*;

- (b) *Inventory changes* (first increases, then decreases);
- (c) Ending *book inventory*;
- (d) *Shipper/receiver differences*;
- (e) Adjusted ending *book inventory*;
- (f) Ending *physical inventory*; and
- (g) *Material unaccounted for*

A statement of the *physical inventory*, listing all *batches* separately and specifying material identification and *batch data* for each *batch*, shall be attached to each material balance report.

Model Subsidiary Arrangements 3.4.2

[The above reports from Paras. 65 and 67 of INFCIRC/153 shall be provided]...as soon as possible, but within 30 days of completion of the month in which the inventory change or physical inventory taking occurred.

7.2. Termination of safeguards

All nuclear material must be reported to the IAEA as part of the initial inventory (or as an addition to the inventory) before the nuclear material can become eligible for termination of safeguards. A CSA provides for safeguards to be terminated based on a decision made by the IAEA, when material meets certain rigorous conditions. The IAEA may determine that nuclear material has been consumed, allowing for termination of safeguards on it. The IAEA may also determine that nuclear material is diluted or has become practicably irrecoverable and no longer “usable for any nuclear activity relevant from the point of view of safeguards.” Termination of safeguards is recorded as an inventory change.

INFCIRC/153 Paragraph 11

The Agreement should provide that safeguards shall terminate on *nuclear material* subject to safeguards thereunder upon determination by the Agency that it has been consumed, or has been diluted in such a way that it is no longer usable for any nuclear activity relevant from the point of view of safeguards, or has become practicably irrecoverable.

INFCIRC/153 Paragraph 13

The Agreement should provide that if the State wishes to use *nuclear material* subject to safeguards thereunder in non-nuclear activities, such as the production of alloys or ceramics, it shall agree with the Agency on the circumstances under which the safeguards on such *nuclear material* may be terminated.

INFCIRC/153 Paragraph 35 (mod SQP)

The Agreement should provide that safeguards shall terminate on *nuclear material* subject to safeguards thereunder under the conditions set forth in paragraph 11. Where the conditions of that paragraph are not met, but the State considers that the recovery of safeguarded *nuclear material* from residues is not for the time being practicable or desirable, the Agency and the State shall consult on the appropriate safeguards measures to be applied. It should further be provided that safeguards shall terminate on *nuclear material* subject to safeguards under the Agreement under the conditions set forth in paragraph 13, provided that the State and the Agency agree that such *nuclear material* is practicably irrecoverable.

Pursuant to an AP, States must provide information on changes in the location of, and further processing of, intermediate or high-level waste containing plutonium, high-enriched uranium or ²³³U on which safeguards have been terminated. This information is provided as part of the updates to the AP declaration, as necessary, but is not included in the initial declaration (unless such plans for further processing exist as of the entry into force of an AP). Updated information, including ‘nothing to declare’ or ‘no change’, needs to be provided in each subsequent annual declaration.

INFCIRC/540 Article 2.a.

a. [The State] shall provide the Agency with a declaration containing:

- (viii) Information regarding the location or further processing of intermediate or high-level waste containing plutonium, *high enriched uranium* or uranium-233 on which safeguards have been terminated pursuant to [paragraph 11 of INFCIRC/153]. For the purpose of this paragraph, "further processing" does not include repackaging of the waste or its further conditioning not involving the separation of elements, for storage or disposal.

INFCIRC/540 Article 3

e. [The State] shall provide to the Agency the information identified in Article 2.a.(viii) 180 days before further processing is carried out and, by 15 May of each year, information on changes in location for the period covering the previous calendar year.

7.3. Exemption from safeguards

States may request that nuclear material which meets certain conditions be exempted from safeguards by the IAEA. The specific conditions for exemption are listed in paragraphs 36 and 37 of INFCIRC/153. If exempted material will be processed, or stored together with safeguarded material, or if it will be exported outside of the State (i.e. its ownership will change), the State must arrange with the IAEA for the re-application of safeguards. The exemption from safeguards of nuclear material, as well as any re-application, is reported as an inventory change. Further reporting is not required for exempted nuclear material exported from a State if it is in transit and does not change ownership (such as depleted uranium shipping containers). A letter clarifying reporting requirements with respect to exports of exempted nuclear material was sent to States from the IAEA Secretariat on 4 July 2000 [15].

INFCIRC/153 Paragraph 36 (mod SQP)

The Agreement should provide that the Agency shall, at the request of the State, exempt *nuclear material* from safeguards, as follows:

- (a) Special fissionable material, when it is used in gram quantities or less as a sensing component in instruments;
- (b) *Nuclear material*, when it is used in non-nuclear activities in accordance with paragraph 13 above, if such *nuclear material* is recoverable; and
- (c) Plutonium with an isotopic concentration of plutonium-238 exceeding 80%.

INFCIRC/153 Paragraph 37 (mod SQP)

The Agreement should provide that the *nuclear material* that would otherwise be subject to safeguards shall be exempted from safeguards at the request of the State, provided that *nuclear material* so exempted in the State may not at any time exceed:

- (a) One kilogram in total of special fissionable material, which may consist of one or more of the following:
 - (i) Plutonium;
 - (ii) Uranium with an *enrichment* of 0.2 (20%) and above, taken account of by multiplying its weight by its *enrichment*; and
 - (iii) Uranium with an *enrichment* below 0.2 (20%) and above that of natural uranium, taken account of by multiplying its weight by five times the square of its *enrichment*;
 - (b) Ten metric tons in total of natural uranium and depleted uranium with an *enrichment* above 0.005 (0.5%);
 - (c) Twenty metric tons of depleted uranium with an *enrichment* of 0.005 (0.5%) or below; and
 - (d) Twenty metric tons of thorium;
- or such greater amounts as may be specified by the Board of Governors for uniform application.

INFCIRC/153 Paragraph 38 (mod SQP)

The Agreement should provide that if exempted *nuclear material* is to be processed or stored together with safeguarded *nuclear material*, provision should be made for the re-application of safeguards thereto.

An AP requires annual updates to information on exempted material declared pursuant to Article 2.a.(vii) of INFCIRC/540.

INFCIRC/540 Article 3

b. [The State] shall provide annual updates to the information identified in Article 2.a.(vii) by 15 May for the period of the previous calendar year. If no changes have occurred, it shall be reported as such.

7.4. Imports and exports of pre-34(c) nuclear material

All States with a CSA (with or without an SQP) are required to report the import or export of pre-34(c) material to NNWSs unless the material is exported specifically for non-nuclear purpose. The standard texts of both the original and modified SQPs state that the information reported on imports and exports of pre-34(c) material may be consolidated and shall be

submitted in an annual report. The IAEA prefers to receive such information, however, within 30 days after the import or export occurs. The import and export of 34(c) nuclear material is discussed in Section 7.5.

INFCIRC/153 Paragraph 34 (original and mod SQP)

The Agreement should provide that:

- (a) When any material containing uranium or thorium which has not reached the stage of the nuclear fuel cycle described in subparagraph (c) below is directly or indirectly exported to a non-nuclear weapon State, the State shall inform the Agency of its quantity, composition and destination, unless the material is exported for specifically non-nuclear purposes;
- (b) When any material containing uranium or thorium which has not reached the stage of the nuclear fuel cycle described in sub-paragraph (c) below is imported, the State shall inform the Agency of its quantity and composition, unless the material is imported for specifically non-nuclear purposes; and ...

The imports and exports of pre-34(c) material for non-nuclear purpose¹⁵ which meet certain conditions must be reported annually under an AP.

INFCIRC/540 Article 2

a. [The State] shall provide the Agency with a declaration containing:

(vi) Information regarding *source material* which has not reached the composition and purity suitable for fuel fabrication or for being isotopically enriched, as follows:

(b) The quantities, the chemical composition and the destination of each export out of [the State], of such material for specifically non-nuclear purposes in quantities exceeding:

(1) Ten metric tons of uranium, or for successive exports of uranium from [the State] to the same State, each of less than ten metric tons, but exceeding a total of ten metric tons for the year;

(2) Twenty metric tons of thorium, or for successive exports of thorium from [the State] to the same State, each of less than twenty metric tons, but exceeding a total of twenty metric tons for the year;

(c) The quantities, chemical composition, current location and use or intended use of each import into [the State] of such material for specifically non-nuclear purposes in quantities exceeding:

(1) Ten metric tons of uranium, or for successive imports of uranium into [the State] each of less than ten metric tons, but exceeding a total of ten metric tons for the year;

(2) Twenty metric tons of thorium, or for successive imports of thorium into [the State] each of less than twenty metric tons, but exceeding a total of twenty metric tons for the year;

it being understood that there is no requirement to provide information on such material intended for a non-nuclear use once it is in its non-nuclear end-use form.

INFCIRC/540 Article 3

c. [The State] shall provide to the Agency, by 15 May of each year, the information identified in Article 2.a.(vi)(b) and (c) for the period covering the previous calendar year.

7.5. International transfers of 34(c) nuclear material

The IAEA keeps track of nuclear material movements between States, which are referred to in INFCIRC/153 as ‘international transfers,’ and include both imports and exports. The IAEA checks that exports to a particular location in a State where the material will be subject to safeguards is actually received at that location and reported as part of the next inventory change report for the receiving MBA. States must notify the IAEA regarding planned transfers of nuclear material outside of the State.

INFCIRC/153 Paragraph 12 (original and mod SQP)

The Agreement should provide, with respect to *nuclear material* subject to safeguards thereunder, for notification of transfers of such material out of the State, in accordance with the provisions set out in paragraphs 92—94 below. ...

¹⁵ For example, thorium is sometimes used as a counterweight in the aircraft industry; an export of more than twenty tons of thorium for this purpose would be reportable pursuant to Article 2.a.(vi) of INFCIRC/540.

The transfer of responsibility for the nuclear material from the exporting State to the receiving State is referred to in paragraph 91 of INFCIRC/153. States through which nuclear material transits en route to its final destination do not have reporting responsibilities regarding the transfer.

INFCIRC/153 Paragraph 91 (original and mod SQP)

The Agreement should provide that *nuclear material* subject or required to be subject to safeguards thereunder which is transferred internationally shall, for purposes of the Agreement, be regarded as being the responsibility of the State:

- (a) In the case of import, from the time that such responsibility ceases to lie with the exporting State, and no later than the time at which the *nuclear material* reaches its destination; and
- (b) In the case of export, up to the time at which the recipient State assumes such responsibility, and no later than the time at which the *nuclear material* reaches its destination.

The Agreement should provide that the States concerned shall make suitable arrangements to determine the point at which the transfer of responsibility will take place. No State shall be deemed to have such responsibility for *nuclear material* merely by reason of the fact that the *nuclear material* is in transit on or over its territory or territorial waters, or that it is being transported under its flag or in its aircraft.

Notifications of international transfers need to be provided to the IAEA in time for inspectors to verify the contents and apply seals as necessary. A State that exports nuclear material has the responsibility for early notification of the shipment. These notifications facilitate the IAEA's verification of the international transfer.

INFCIRC/153 Paragraph 92

The Agreement should provide that any intended transfer out of the State of safeguarded *nuclear material* in an amount exceeding one *effective kilogram*, or by successive shipments to the same State within a period of three months each of less than one *effective kilogram* but exceeding in total one *effective kilogram*, shall be notified to the Agency after the conclusion of the contractual arrangements leading to the transfer and normally at least two weeks before the *nuclear material* is to be prepared for shipping. The Agency and the State may agree on different procedures for advance notification. The notification shall specify:

- (a) The identification and, if possible, the expected quantity and composition of the *nuclear material* to be transferred, and the *material balance area* from which it will come;
- (b) The State for which the *nuclear material* is destined;
- (c) The dates on and locations at which the *nuclear material* is to be prepared for shipping;
- (d) The approximate dates of dispatch and arrival of the *nuclear material*; and
- (e) At what point of the transfer the recipient State will assume responsibility for the *nuclear material*, and the probable date on which this point will be reached.

INFCIRC/153 Paragraph 93

The Agreement should further provide that the purpose of this notification shall be to enable the Agency if necessary to identify, and if possible verify the quantity and composition of, *nuclear material* subject to safeguards under the Agreement before it is transferred out of the State and, if the Agency so wishes or the State so requests, to affix seals to the *nuclear material* when it has been prepared for shipping...

Model Subsidiary Arrangements 3.6.1 – 3.6.5

Advance notification of nuclear material transfers out of [the State] of more than one effective kilogram [or shipments of smaller amounts over three months which when combined exceed one effective kilogram] [should] reach the Agency at least two weeks before nuclear material is to be prepared for shipment.

If nuclear material is exported to a State where it will not be under safeguards (i.e., to a NWS), the exporting State must make arrangements for the receiving State to notify the IAEA of its receipt within three months.

INFCIRC/153 Paragraph 94

The Agreement should further provide that if the *nuclear material* will not be subject to Agency safeguards in the recipient State, the exporting State shall make arrangements for the Agency to receive, within three months of the time when the recipient State accepts responsibility for the *nuclear material* from the exporting State, confirmation by the recipient State of the transfer.

A State that imports the material has the responsibility to notify the IAEA regarding the anticipated location and date of receipt and the schedule for unpacking of the material, among other things.

INFCIRC/153 Paragraph 95 (mod SQP)

The Agreement should provide that the expected transfer into the State of *nuclear material* required to be subject to safeguards in an amount greater than one *effective kilogram*, or by successive shipments from the same State within a period of three months each of less than one *effective kilogram* but exceeding in total one *effective kilogram*, shall be notified to the Agency as much in advance as possible of the expected arrival of the *nuclear material*, and in any case not later than the date on which the recipient State assumes responsibility therefor. The Agency and the State may agree on different procedures for advance notification. The notification shall specify:

- (a) The identification and, if possible, the expected quantity and composition of the *nuclear material*;
- (b) At what point of the transfer responsibility for the *nuclear material* will be assumed by the State for the purposes of the Agreement, and the probable date on which this point will be reached; and
- (c) The expected date of arrival, the location to which the *nuclear material* is to be delivered and the date on which it is intended that the *nuclear material* should be unpacked.

INFCIRC/153 Paragraph 96 (mod SQP)

The Agreement should provide that the purpose of this notification shall be to enable the Agency if necessary to identify, and if possible verify the quantity and composition of, *nuclear material* subject to safeguards which has been transferred into the State, by means of inspection of the consignment at the time it is unpacked. ...

Model Subsidiary Arrangements 3.6.1 – 3.6.5

Dispatch of advance notification of nuclear material transfers into [the State] each more than [or smaller amounts within three months which when combined exceed] one effective kilogram. For presentation and content see form under Code 7.2 to be submitted to reach the Agency not more than seven days before the first shipment is to be unpacked.

Finally, if either the exporting or the importing State believes that there may have been a loss of nuclear material during transfer, or a significant delay, the State must notify the IAEA.

INFCIRC/153 Paragraph 97

The Agreement should provide that in the case of international transfers a special report as envisaged in paragraph 68 above shall be made if any unusual incident or circumstances lead the State to believe that there is or may have been loss of *nuclear material*, including the occurrence of significant delay during the transfer.

7.6. Non-application of safeguards to nuclear material to be used in non-peaceful activities

CSAs allow for the possibility that a State may wish to use nuclear material in a non-peaceful, but not prohibited, nuclear activity¹⁶. In such a case, paragraph 14 of INFCIRC/153 specifies procedures which must be followed by the State, and requires the State and the IAEA to make arrangements allowing for the non-application of safeguards during the use of the nuclear material in that activity and for the re-application of safeguards as soon as the nuclear material is reintroduced into a peaceful nuclear activity.

INFCIRC/153 Paragraph 14

The Agreement should provide that if the State intends to exercise its discretion to use *nuclear material* which is required to be safeguarded thereunder in a nuclear activity which does not require the application of safeguards under the Agreement, the following procedures will apply:

- (a) The State shall inform the Agency of the activity, making it clear:
 - (i) That the use of the *nuclear material* in a non-proscribed military activity will not be in conflict with an undertaking the State may have given and in respect of which Agency safeguards apply, that the *nuclear material* will be used only in a peaceful nuclear activity; and

¹⁶ This refers to a non-peaceful activity which is not prohibited by the NPT, such as the use of nuclear material in naval fuel for submarine propulsion.

(ii) That during the period of non-application of safeguards the *nuclear material* will not be used for the production of nuclear weapons or other nuclear explosive devices;

(b) The Agency and the State shall make an arrangement so that, only while the *nuclear material* is in such an activity, the safeguards provided for in the Agreement will not be applied. The arrangement shall identify, to the extent possible, the period or circumstances during which safeguards will not be applied. In any event, the safeguards provided for in the Agreement shall again apply as soon as the *nuclear material* is reintroduced into a peaceful nuclear activity.

The Agency shall be kept informed of the total quantity and composition of such unsafeguarded *nuclear material* in the State and of any exports of such material; and

(c) Each arrangement shall be made in agreement with the Agency. The Agency's agreement shall be given as promptly as possible; it shall only relate to the temporal and procedural provisions, reporting arrangements, etc., but shall not involve any approval or classified knowledge of the military activity or relate to the use of the *nuclear material* therein.

7.7. Outcomes of implementing the required activities

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540:
Updated Information on Nuclear Material			
<i>Updates to Information on Nuclear Material</i>			
Correct, timely and complete information is provided to the IAEA on physical inventories, inventory changes and material balances for each MBA. The information is based on records and operational data and in sufficient detail to enable a conclusive evaluation of each material balance in an efficient manner.	States with CSA and no SQP	63, 64, 65 SA Code 10	
A correct and complete material balance report for every MBA in the State is submitted to the IAEA within 30 days after the physical inventory in that MBA has been taken, together with a complete and accurate physical inventory listing for that MBA.	States with CSA and no SQP	63, 67 SA 3.4.2	
<i>Termination of Safeguards</i>			
Nuclear material on which the Agency has approved termination from safeguards, is properly accounted for and reported on time by the State to the IAEA, as an inventory change.	States with CSA and no SQP, or with Mod SQP	11, 13, 35	
Correct and complete information is provided on time to the IAEA regarding the location or further processing of intermediate or high-level waste containing plutonium, high enriched uranium or ²³³ U on which safeguards have been terminated.	AP		2.a. (viii), 3
<i>Exemption from Safeguards</i>			
Nuclear material on which the Agency has approved exemption from safeguards, is properly accounted for and reported on time by the State to the IAEA, as an inventory change.	States with CSA and no SQP, or with Mod SQP	36, 37	
Advance notification of planned processing of nuclear material exempted from safeguards, or its co-location with safeguarded material, is provided to the IAEA in sufficient time such that effective safeguards can be re-applied.	States with CSA and no SQP, or with Mod	38	

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540:
	SQP		
Correct and complete updated information is provided to the IAEA regarding exempted material that meets the conditions of AP Article 2.a.(vii), by 15 May of each year, for the period covering the previous calendar year.	AP		2.a. (vii), 3
<i>Imports and Exports of Pre-34(c) Material</i>			
Correct, complete and timely information is provided to the IAEA regarding imports and exports of pre-34(c) material for nuclear-purpose.	All States with CSAs	34(a) and (b)	
Correct and complete declarations are provided on time to the IAEA regarding imports and exports of pre-34(c) material for non-nuclear purpose, which meet the conditions set out in INFCIRC/540 Article 2.a.(vi) b. and c., by 15 May of each year, for the period covering the previous calendar year.	AP		2.a. (vi) b and c, 3
<i>International Transfers</i>			
The criteria and process for assumption of responsibility for nuclear material received, or transfer of responsibility for nuclear material shipped, are defined in the State's legal and regulatory requirements.	All States with CSAs	12, 91	
Complete and correct notifications are provided to the IAEA for planned exports of nuclear material which meet the conditions specified in paragraph 95 of INFCIRC/153, within the required time frame.	States with CSA and no SQP	92, 93, 94 SA 3.6	
Notifications on imports of pre-34(c) and 34(c) nuclear material are provided well in advance of the planned import, and include all required information regarding the import.	States with CSA and no SQP, or with Mod SQP	95, 96 SA 3.6	
When requested, the State facilitates the IAEA's verification and application of seals on shipments and the verification of quantity and composition of nuclear material received.	States with CSA and no SQP	93	
Any significant delay or suspicion of loss of nuclear material during international transfer is reported to the IAEA immediately in a special report.	States with CSA and no SQP	97	
<i>Non-Application of Safeguards</i>			
When safeguards are not applied on nuclear material for a planned non-peaceful, non-prohibited use, the State provides assurance that no "peaceful use" obligations undertaken by the State will be broken during such use, and arrangements are developed and implemented by the State and the IAEA to ensure that objectives of the Agreement are met.	All States with CSAs	14	

8. PROVISION OF SPECIAL REPORTS, AMPLIFICATIONS AND CLARIFICATIONS

A State must report unusual occurrences of relevance to safeguards, with particular focus on the possible loss of, or loss of control over, nuclear material, through ‘special reports,’ within 72 hours of the event. Also, the IAEA may ask the State to further explain information in other reports or declarations, by requesting ‘amplifications’ (requesting additional information) or ‘clarifications’ (requesting the resolution of questions regarding the information provided.) For AP declarations, States should respond to requests for amplification or clarification regarding a particular line in the declaration, by providing a new line that has been revised to address the request.

<p>INFCIRC/153 Paragraph 68 (mod SQP) The Agreement should provide that the State shall make special reports without delay: (a) If any unusual incident or circumstances lead the State to believe that there is or may have been loss of <i>nuclear material</i> that exceeds the limits to be specified for this purpose in the Subsidiary Arrangements; or (b) If the containment has unexpectedly changed from that specified in the Subsidiary Arrangements to the extent that unauthorized removal of <i>nuclear material</i> has become possible.</p>
<p>Model Subsidiary Arrangements 3.5.1 [Reports described in 68 above should be] submitted within 72 hours of the event.</p>
<p>Model Subsidiary Arrangements 3.5.3 Dispatch of amplification and clarification of special reports [should be provided] immediately on receipt of Agency's request.</p>
<p>INFCIRC/153 Paragraph 69 (mod SQP) The Agreement should provide that at the Agency's request the State shall supply amplifications or clarifications of any report, in so far as relevant for the purpose of safeguards.</p>
<p>Model Subsidiary Arrangements 3.4.3 [Reports described in 69 above should be submitted] within 30 days of the date of the Agency's request.</p>
<p>INFCIRC/540 Article 2 c. Upon request by the Agency, [the State] shall provide amplifications or clarifications of any information it has provided under this Article, in so far as relevant for the purpose of safeguards.</p>

8.1. Outcomes of implementing the required activities

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540:
Special Reports, Amplifications and Clarifications			
Any significant delay or any suspicion of loss of nuclear material is reported to the IAEA immediately in a special report, and no later than 72 hours after the event occurred.	All States with CSAs	68, 97	
Amplifications or clarifications of any report or declaration can be provided to the IAEA by the State within 30 days of the Agency's request.	All States with CSAs	69	2.c.

9. STATE PROVISION OF ACCESS TO THE IAEA

IAEA access to locations and information is essential for meeting the objectives of safeguards agreements. The SRA is responsible for facilitating the access and providing support to IAEA inspectors. IAEA activities in the State fall into three major categories – design information verification, inspections, and complementary access. Each category of activity

involves various tasks needed to achieve the technical objectives, and may involve access to a variety of locations within a facility, site or other locations in a State.

9.1. Design information verification

Facility design information is examined and verified by the IAEA for the purposes of evaluating material flows and inventories, determining the structure of MBAs and designing the safeguards approach. Design information is periodically re-verified (i.e., the information in the DIQ is compared with the facility features observed by the inspectors) to ascertain its continued accuracy, determine whether the current safeguards approach needs to be modified, assess whether new methods for accountancy verification or for containment and surveillance are needed, and confirm that the Facility Attachment remains valid.

The IAEA conducts design information verification (DIV) at facilities during all stages of their construction, operation, closure and decommissioning. The State, therefore, must facilitate access by inspectors to meet the objectives of design information verification. The access needed by inspectors to perform design information verification goes beyond those locations typically visited during an inspection. To achieve the verification objectives, inspectors need to verify all safeguards-relevant aspects of the facility operation, which may require visits to locations where nuclear material is not located, and to locations where nuclear material is located but which are often not accessible when the facility is operating (e.g., due to prohibitively high radiation levels). Locations that inspectors visit during DIVs include, for example, multi-purpose rooms, storage rooms, and control rooms. DIV is often conducted during physical inventory verification, for example, because locations not routinely accessible can be visited at that time while operations are suspended.

When the IAEA has determined for safeguards purposes that a facility has been decommissioned, it may confirm the continued decommissioned status of the facility in States with an AP, using complementary access.

INFCIRC/153 Paragraph 48

The Agreement should provide that the Agency, in co-operation with the State, may send inspectors to *facilities* to verify the design information provided to the Agency pursuant to paragraphs 42—45 above for the purposes stated in paragraph 46.

INFCIRC/540 Article 4

The following shall apply in connection with the implementation of complementary access under Article 5 of this Protocol:

a. The Agency shall not mechanistically or systematically seek to verify the information referred to in Article 2; however, the Agency shall have access to:

(iii) Any location referred to in Article 5.a.(iii) to the extent necessary for the Agency to confirm, for safeguards purposes, [the State]'s declaration of the decommissioned status of a *facility* or of a *location outside facilities* where *nuclear material* was customarily used.

9.2. Inspections

The IAEA may carry out three kinds of inspections: ad hoc, routine and special. States must ensure the IAEA is able to carry out its activities during inspections, by providing access to locations and to information necessary for the inspectors to meet the objectives of the inspection. As mentioned in Section 3 of this Guidance, States have the right to have IAEA inspectors accompanied during inspections, provided that in doing so, inspectors are not delayed or otherwise impeded in carrying out their functions.

INFCIRC/153 Paragraph 89 (mod SQP)

The Agreement should provide that the State shall have the right to have inspectors accompanied during their inspections by representatives of the State, provided that inspectors shall not thereby be delayed or otherwise impeded in the exercise of their functions.

The IAEA's authority regarding inspection activities (for any of the three kinds of inspections) are described in paragraphs 74 and 75 of INFCIRC/153.

INFCIRC/153 Paragraph 74 (mod SQP)

The Agreement should provide that for the purposes stated in paragraphs 71—73 above the Agency may:

- (a) Examine the records kept pursuant to paragraphs 51—58;
- (b) Make independent measurements of all *nuclear material* subject to safeguards under the Agreement;
- (c) Verify the functioning and calibration of instruments and other measuring and control equipment;
- (d) Apply and make use of surveillance and containment measures; and
- (e) Use other objective methods which have been demonstrated to be technically feasible.

INFCIRC/153 Paragraph 75 (mod SQP)

It should further be provided that within the scope of paragraph 74 above the Agency shall be enabled:

- (a) To observe that samples at *key measurement points* for material balance accounting are taken in accordance with procedures which produce representative samples, to observe the treatment and analysis of the samples and to obtain duplicates of such samples;
- (b) To observe that the measurements of *nuclear material* at *key measurement points* for material balance accounting are representative, and to observe the calibration of the instruments and equipment involved;
- (c) To make arrangements with the State that, if necessary:
 - (i) Additional measurements are made and additional samples taken for the Agency's use;
 - (ii) The Agency's standard analytical samples are analysed;
 - (iii) Appropriate absolute standards are used in calibrating instruments and other equipment; and
 - (iv) Other calibrations are carried out;
- (d) To arrange to use its own equipment for independent measurement and surveillance, and if so agreed and specified in the Subsidiary Arrangements, to arrange to install such equipment;
- (e) To apply its seals and other identifying and tamper-indicating devices to containments, if so agreed and specified in the Subsidiary Arrangements; and
- (f) To make arrangements with the State for the shipping of samples taken for the Agency's use.

9.2.1. Ad hoc inspections

Ad hoc inspections are normally conducted to verify the information contained in the initial report, before Subsidiary Arrangements have been concluded and Facility Attachments have been prepared, or to verify nuclear material before it is exported or upon receipt in the importing State.

INFCIRC/153 Paragraph 71 (mod SQP)

The Agreement should provide that the Agency may make ad hoc inspections in order to:

- (a) Verify the information contained in the initial report on the *nuclear material* subject to safeguards under the Agreement;
- (b) Identify and verify changes in the situation which have occurred since the date of the initial report; and
- (c) Identify, and if possible verify the quantity and composition of, *nuclear material* in accordance with paragraphs 93 and 96 below, before its transfer out of or upon its transfer into the State.

INFCIRC/153 Paragraph 76 (mod SQP)

The Agreement should provide that:

- (a) For the purposes specified in sub-paragraphs 71(a) and (b) and until such time as the *strategic points* have been specified in the Subsidiary Arrangements, the Agency's inspectors shall have access to any location where the initial report or any inspections carried out in connection with it indicate that *nuclear material* is present;
- (b) For the purposes specified in sub-paragraph 71(c) the inspectors shall have access to any location of which the Agency has been notified in accordance with sub-paragraphs 92(c) or 95(c) below...

9.2.2. Routine inspections (announced and unannounced)

Routine inspections are conducted after the Subsidiary Arrangements Attachments have been concluded and specific information has been incorporated in the Attachments, including information on ‘strategic points’ in each facility. The purposes of routine inspections are listed in paragraph 72 of INFCIRC/153.

The IAEA has the right to conduct a portion of the routine inspections without advance notification to the State or operator, according to the principle of random sampling. This supplementary measure can achieve increases in both effectiveness and efficiency, and is an important component of the State level concept for safeguards planning and implementation. States have the right to have inspectors accompanied during unannounced inspections, but as stated in paragraph 89 of INFCIRC/153, such accompaniment must not delay or otherwise impede the inspectors in the exercise of their functions. States may find the logistics of arranging for accompaniment during unannounced inspections to be challenging, but the IAEA may nonetheless exercise its right to conduct unannounced inspections. The IAEA periodically communicates to the State its general programme of inspections (both announced and unannounced), to help minimize impacts on the facilities. Inspectors conducting a routine inspection must be granted access and support to carry out their activities to meet the verification objectives of the inspection.

INFCIRC/153 Paragraph 72

The Agreement should provide that the Agency may make routine inspections in order to:

- (a) Verify that reports are consistent with records;
- (b) Verify the location, identity, quantity and composition of all *nuclear material* subject to safeguards under the Agreement; and
- (c) Verify information on the possible causes of material unaccounted for, shipper/receiver differences and uncertainties in the book *inventory*.

INFCIRC/153 Paragraph 76 (mod SQP)

The Agreement should provide that:

- (c) For the purposes specified in paragraph 72 above the Agency's inspectors shall have access only to the *strategic points* specified in the Subsidiary Arrangements and to the records maintained pursuant to paragraphs 51—58; and ...

INFCIRC/153 Paragraph 84

However, the Agreement should also provide that as a supplementary measure, the Agency may carry out without advance notification a portion of the routine inspections pursuant to paragraph 80 above in accordance with the principle of random sampling. ...Similarly, the State shall make every effort to facilitate the task of the inspectors.

INFCIRC/153 Paragraph 89 (mod SQP)

The Agreement should provide that the State shall have the right to have inspectors accompanied during their inspections by representatives of the State, provided that inspectors shall not thereby be delayed or otherwise impeded in the exercise of their functions.

9.2.3. Special inspections

Special inspections may be either additional to the routine inspection effort, or involve access to information or locations which are additional to those involved in routine and ad hoc inspections, or both. While special inspections have not often been carried out, they are an important element of the IAEA’s legal authority to implement safeguards, and may be necessary in order for the IAEA to achieve the objectives of the safeguards agreement.

INFCIRC/153 Paragraph 73 (mod SQP)

The Agreement should provide that the Agency may make special inspections subject to the procedures laid down in paragraph 77 below:

- (a) In order to verify the information contained in special reports; or
- (b) If the Agency considers that information made available by the State, including explanations from the State

and information obtained from routine inspections, is not adequate for the Agency to fulfil its responsibilities under the Agreement.

An inspection shall be deemed to be special when it is either additional to the routine inspection effort provided for in paragraphs 78—82 below, or involves access to information or locations in addition to the access specified in paragraph 76 for ad hoc and routine inspections, or both.

INFCIRC/153 Paragraph 77 (mod SQP)

The Agreement should provide that in circumstances which may lead to special inspections for the purposes specified in paragraph 73 above the State and the Agency shall consult forthwith. As a result of such consultations the Agency may make inspections in addition to the routine inspection effort provided for in paragraphs 78—82 below, and may obtain access in agreement with the State to information or locations in addition to the access specified in paragraph 76 above for ad hoc and routine inspections. Any disagreement concerning the need for additional access shall be resolved in accordance with paragraphs 21 and 22; in case action by the State is essential and urgent, paragraph 18 shall apply.

9.3. Complementary access

Complementary access refers to access provided to IAEA inspectors by a State under an AP, to enable the inspectors to carry out specific activities to meet the objectives of the access. The IAEA may request complementary access to a variety of locations in a State with an AP in force. The IAEA may request access to any location on a site; complementary access at sites is often conducted in conjunction with DIVs or inspections at facilities on or at the site. Complementary access is also used to confirm the continued decommissioned status of a facility or LOF. The IAEA may also request complementary access to locations at which activities take place which are declared pursuant to Article 2 of INFCIRC/540 by a State to the IAEA. Each type of access requested by the IAEA has specific advance notice requirements; in some cases the advance notice may be less than two hours. A summary of complementary access, activities and notification can be found at the link in the References. Access to any location in a State under such conditions requires effective coordination within the State, and as with inspections, the State has the right to accompany IAEA inspectors on complementary access, provided that such accompaniment does not impede or delay the access.

INFCIRC/540 Article 4

The following shall apply in connection with the implementation of complementary access under Article 5 of this Protocol:

- a. The Agency shall not mechanistically or systematically seek to verify the information referred to in Article 2; however, the Agency shall have access to:
- (i) Any location referred to in Article 5.a.(i) or (ii) on a selective basis in order to assure the absence of undeclared *nuclear material* and activities;
 - (ii) Any location referred to in Article 5.b. or c. to resolve a question relating to the correctness and completeness of the information provided pursuant to Article 2 or to resolve an inconsistency relating to that information; ...

INFCIRC/540 Article 5

[The State] shall provide the Agency with access to:

- a. (i) Any place on a *site*;
- (ii) Any location identified by [the State] under Article 2.a.(v)-(viii);
 - (iii) Any *decommissioned facility* or *decommissioned location outside facilities* where *nuclear material* was customarily used.
- b. Any location identified by [the State] under Article 2.a.(i), Article 2.a.(iv), Article 2.a.(ix)(b) or Article 2.b, other than those referred to in paragraph a.(i) above, provided that if [the State] is unable to provide such access, [the State] shall make every reasonable effort to satisfy Agency requirements, without delay, through other means.
- c. Any location specified by the Agency, other than locations referred to in paragraphs a. and b., to carry out *location-specific environmental sampling*, provided that if [the State] is unable to provide such access, [the State] shall make every reasonable effort to satisfy Agency requirements, without delay, at adjacent locations or through other means.

INFCIRC/540 Article 4

The following shall apply in connection with the implementation of complementary access under Article 5 of this Protocol:

f. [The State] shall have the right to have Agency inspectors accompanied during their access by representatives of [the State], provided that the inspectors shall not thereby be delayed or otherwise impeded in the exercise of their functions.

During complementary access, inspectors perform activities as necessary to address the purpose of the access. The kinds of activities inspectors may perform during the different types of access are described in Article 6 and 9 of INFCIRC/540.

INFCIRC/540 Article 6

When implementing Article 5, the Agency may carry out the following activities:

a. For access in accordance with Article 5.a.(i) or (iii): visual observation; collection of environmental samples; utilization of radiation detection and measurement devices; application of seals and other identifying and tamper indicating devices specified in Subsidiary Arrangements; and other objective measures which have been demonstrated to be technically feasible and the use of which has been agreed by the Board of Governors (hereinafter referred to as the "Board") and following consultations between the Agency and [the State].

b. For access in accordance with Article 5.a.(ii): visual observation; item counting of *nuclear material*; non-destructive measurements and sampling; utilization of radiation detection and measurement devices; examination of records relevant to the quantities, origin and disposition of the material; collection of environmental samples; and other objective measures which have been demonstrated to be technically feasible and the use of which has been agreed by the Board and following consultations between the Agency and [the State].

c. For access in accordance with Article 5.b.: visual observation; collection of environmental samples; utilization of radiation detection and measurement devices; examination of safeguards relevant production and shipping records; and other objective measures which have been demonstrated to be technically feasible and the use of which has been agreed by the Board and following consultations between the Agency and [the State].

d. For access in accordance with Article 5.c.: collection of environmental samples and, in the event the results do not resolve the question or inconsistency at the location specified by the Agency pursuant to Article 5.c., utilization at that location of visual observation, radiation detection and measurement devices, and, as agreed by [the State] and the Agency, other objective measures.

INFCIRC/540 Article 9

[The State] shall provide the Agency with access to locations specified by the Agency to carry out *wide-area environmental sampling*, provided that if [the State] is unable to provide such access it shall make every reasonable effort to satisfy Agency requirements at alternative locations. ...

Managed access refers to steps taken by the State to prevent the dissemination of proliferation-sensitive information, to meet safety or physical security requirements, or to protect proprietary or commercially sensitive information, in such a manner as to not impede the IAEA's activities to fulfil the purpose of the access. An example of managed access is the designation of routes through buildings which avoid areas where inspectors' safety is a concern but which allow inspectors to gain a thorough understanding of the function and purpose of the building. Ultimately, the State must provide sufficient access to information and locations during complementary access to allow the IAEA inspectors to fulfil the purpose of the access.

INFCIRC/540 Article 7

a. Upon request by [the State], the Agency and [the State] shall make arrangements for managed access under this Protocol in order to prevent the dissemination of proliferation sensitive information, to meet safety or physical protection requirements, or to protect proprietary or commercially sensitive information. Such arrangements shall not preclude the Agency from conducting activities necessary to provide credible assurance of the absence of undeclared *nuclear material* and activities at the location in question, including the resolution of a question relating to the correctness and completeness of the information referred to in Article 2 or of an inconsistency relating to that information.

b. [The State] may, when providing the information referred to in Article 2, inform the Agency of the places at a *site* or location at which managed access may be applicable.

c. Pending the entry into force of any necessary Subsidiary Arrangements, [the State] may have recourse to managed access consistent with the provisions of paragraph a. above.

9.4. Limitations or extensions of access

If unusual circumstances arise which prevent or limit access by the IAEA under a CSA, the State and the IAEA must make arrangements so that the IAEA can implement safeguards until such access can be restored. An example of such unusual circumstances might be a natural disaster or an accident at a nuclear facility. APs provide for the State to offer access to the IAEA to locations in addition to those related to Articles 5 and 9, and provides for the State to request the IAEA to conduct verification activities at a particular location. The IAEA is required to make every reasonable effort to act upon such a request.

INFCIRC/153 Paragraph 76 (mod SQP)

The Agreement should provide that:

(a)...

(d) In the event of the State concluding that any unusual circumstances require extended limitations on access by the Agency, the State and the Agency shall promptly make arrangements with a view to enabling the Agency to discharge its safeguards responsibilities in the light of these limitations. The Director General shall report each such arrangement to the Board.

INFCIRC/540 Article 8

Nothing in this Protocol shall preclude [the State] from offering the Agency access to locations in addition to those referred to in Articles 5 and 9 or from requesting the Agency to conduct verification activities at a particular location. The Agency shall, without delay, make every reasonable effort to act upon such a request.

9.5. Outcomes of implementing the required activities

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540:
Facilitating IAEA Activities in the State			
<i>Verification of Facility Design and Status</i>			
Timely and adequate access is provided to IAEA inspectors to examine and verify design information, and to re-verify design information to assure its continued accuracy and validity.	States with CSA and no SQP	48	
Timely and adequate access is provided to IAEA inspectors to confirm the continued decommissioned status of facilities.	AP		4.a.
<i>Inspections</i>			
Prompt access is provided to the IAEA to all facilities and LOFs.	States with CSA and no SQP, or with Mod SQP	76, 89	
Prompt access is provided to the IAEA to locations to carry out inspection activities.	States with CSA and no SQP, or with Mod SQP	71 – 77, 89	
Correct, complete and up-to-date reports, records and supporting documentation are provided to IAEA inspectors in a timely manner for examination, and inspectors receive timely access to carry out verification activities to achieve their inspection objectives.	States with CSA and no SQP, or with Mod SQP	71-77, 89	
Procedures are established and implemented in the State to	States with	84	

permit IAEA inspectors unannounced access to facilities as required.	CSA and no SQP		
Procedures are established and implemented in the State to enable and facilitate IAEA inspectors' access as necessary to verify information contained in special reports.	States with CSA and no SQP, or with Mod SQP	77, 89	
Complementary Access			
IAEA inspectors are granted access without delay to carry out complementary access, and are able to carry out activities to meet the objective of the access, unimpeded by the accompaniment of the SRA or the use of managed access.	AP		4, 5
Access is provided to any location requested by the IAEA for the collection of location-specific environmental samples.	AP		5
All requested records, reports and other information are provided to the IAEA in a timely manner, in order to meet the objectives of the access.	AP		6
The IAEA is informed about places where managed access may be applicable before complementary access is performed at those locations.	AP		7

10. IAEA RIGHTS AND OBLIGATIONS

The rights and obligations of the IAEA in carrying out activities to meet the safeguards objectives are described in this section.

10.1. Efficient safeguards implementation

The IAEA is obligated to adhere to requirements specified in CSAs in designing and implementing its safeguards approaches and activities. The IAEA must implement safeguards in a manner designed to avoid undue interference in facility operations and hampering of States' economic and technological development. The IAEA must also protect State information, make full use of State findings and take advantage of technological advancements in safeguards to achieve cost efficiencies.

INFCIRC/153 Paragraph 4

The Agreement should provide that safeguards shall be implemented in a manner designed:

- (a) to avoid hampering the economic and technological development of the State or international co-operation in the field of peaceful nuclear activities, including international exchange of nuclear material;
- (b) to avoid undue interference in the State's peaceful nuclear activities, and in particular in the operation of *facilities*; and
- (c) to be consistent with prudent management practices required for the economic and safe conduct of nuclear activities.

INFCIRC/153 Paragraph 6

The Agreement should provide that in implementing safeguards pursuant thereto the Agency shall take full account of technological developments in the field of safeguards, and shall make every effort to ensure optimum cost effectiveness and the application of the principle of safeguarding effectively the flow of *nuclear material* subject to safeguards under the Agreement by use of instruments and other techniques at certain *strategic points* to the extent that present or future technology permits. In order to ensure optimum cost effectiveness, use should be made, for example, of such means as:

- (a) containment as a means of defining *material balance areas* for accounting purposes;
- (b) statistical techniques and random sampling in evaluating the flow of *nuclear material*; and

(c) concentration of verification procedures on those stages in the nuclear fuel cycle involving the production, processing, use or storage of *nuclear material* from which nuclear weapons or other nuclear explosive devices could readily be made, and minimization of verification procedures in respect of other *nuclear material*, on condition that this does not hamper the Agency in applying safeguards under the Agreement.

INFCIRC/153 Paragraph 9

... The visits and activities of Agency inspectors shall be so arranged as to reduce to a minimum the possible inconvenience and disturbance to the State and to the peaceful nuclear activities inspected

INFCIRC/153 Paragraph 87 (mod SQP)

The Agreement should provide that inspectors, in exercising their functions under paragraphs 48 and 71-75 above, shall carry out their activities in a manner designed to avoid hampering or delaying the construction, commissioning or operation of facilities, or affecting their safety. In particular inspectors shall not operate any facility themselves or direct the staff of a facility to carry out any operation. If inspectors consider that in pursuance of paragraphs 74 and 75, particular operations in a facility should be carried out by the operator, they shall make a request therefor.

INFCIRC/153 Paragraph 93

...However, the transfer of nuclear material [by the State] shall not be delayed in any way by any action taken or contemplated by the Agency pursuant to [the State's] notification.

INFCIRC/153 Paragraph 96 (Mod SQP)

...However, the unpacking [by the State] shall not be delayed in any way by any action taken or contemplated by the Agency pursuant to [the State's] notification.

10.2. Examination and verification of information on facilities and LOFs

The rights and obligations of the IAEA in reviewing, verifying and re-verifying facility design information are provided for in CSAs. At the request of the State, the IAEA will examine design information of particular sensitivity on the premises of the State. This information is retained in the State, normally at the facility, under IAEA seal. It should be noted that information provided to the IAEA regarding LOFs is used, to the extent relevant, to support development of a safeguards approach for the State and to enable the IAEA to meet its safeguards objectives. The IAEA may use information about LOFs for the purposes described in paragraph 46 (b) through (f) of INFCIRC/153.

INFCIRC/153 Paragraph 8

... The Agency shall require only the minimum amount of information and data consistent with carrying out its responsibilities under the Agreement. Information pertaining to facilities shall be the minimum necessary for safeguarding nuclear material subject to safeguards under the Agreement. In examining design information, the Agency shall, at the request of the State, be prepared to examine on premises of the State, design information which the State regards as being of particular sensitivity. Such information would not have to be physically transmitted to the Agency provided that it remained available for ready further examination by the Agency on premises of the State.

INFCIRC/153 Paragraph 46

The Agreement should provide that design information made available to the Agency shall be used for the following purposes:

- (a) To identify the features of *facilities* and *nuclear material* relevant to the application of safeguards to *nuclear material* in sufficient detail to facilitate verification;
- (b) To determine *material balance areas* to be used for Agency accounting purposes and to select those *strategic points* which are *key measurement points* and which will be used to determine the *nuclear material* flows and inventories; in determining such *material balance areas* the Agency shall, inter alia, use the following criteria:
 - (i) The size of the *material balance area* should be related to the accuracy with which the material balance can be established;
 - (ii) In determining the *material balance area* advantage should be taken of any opportunity to use containment and surveillance to help ensure the completeness of flow measurements and thereby simplify the application of safeguards and concentrate measurement efforts at *key measurement points*;
 - (iii) A number of *material balance areas* in use at a *facility* or at distinct sites may be combined in one *material balance area* to be used for Agency accounting purposes when the Agency determines that this is consistent with its verification requirements; and

(iv) If the State so requests, a special *material balance area* around a process step involving commercially sensitive information may be established;

(c) To establish the nominal timing and procedures for taking of *physical inventory* for Agency accounting purposes;

(d) To establish the records and reports requirements and records evaluation procedures;

(e) To establish requirements and procedures for verification of the quantity and location of *nuclear material*; and

(f) To select appropriate combinations of containment and surveillance methods and techniques and the *strategic points* at which they are to be applied.

It should further be provided that the results of the examination of the design information shall be included in the Subsidiary Arrangements.

INFCIRC/153 Paragraph 47

The Agreement should provide that design information shall be re-examined in the light of changes in operating conditions, of developments in safeguards technology or of experience in the application of verification procedures, with a view to modifying the action the Agency has taken pursuant to paragraph 46 above.

INFCIRC/153 Paragraph 50 (mod SQP)

The Agreement should provide that the information made available to the Agency in respect of *nuclear material* customarily used outside *facilities* may be used, to the extent relevant, for the purposes set out in sub-paragraphs 46(b) – (f) above.

INFCIRC/153 Paragraph 83 (mod SQP)

The Agreement should provide that the Agency shall give advance notice to the State before arrival of inspectors at facilities or material balance areas outside facilities, as follows:

(a) For ad hoc inspections pursuant to sub-paragraph 71(c) [material to be transferred]..., at least 24 hours, for those pursuant to sub-paragraphs 71(a) and (b) [to verify the initial report], as well as the activities provided for in paragraph 48 [to verify design information], at least one week; ...

10.3. Inspections

CSAs set out a number of requirements regarding inspection effort, scope and frequency, and how inspections should be designed to achieve efficiencies and reduce intrusiveness while ensuring that safeguards objectives are met.

INFCIRC/153 Paragraph 29

To this end the Agreement should provide for the use of material accountancy as a safeguards measure of fundamental importance, with containment and surveillance as important complementary measures.

INFCIRC/153 Paragraph 70

The Agreement should provide that the Agency shall have the right to make inspections as provided for in paragraphs 71-82 below.

INFCIRC/153 Paragraph 78

The Agreement should provide that the number, intensity, duration and timing of routine inspections shall be kept to the minimum consistent with the effective implementation of the safeguards procedures...and the Agency shall make the optimum and most economical use of available inspection resources.

INFCIRC/153 Paragraph 79

The Agreement should provide that in the case of *facilities* and *material balance areas* outside *facilities* with a content or *annual throughput*, whichever is greater, of *nuclear material* not exceeding five effective kilograms, routine inspections shall not exceed one per year. For other *facilities* the number, intensity, duration, timing and mode of inspections shall be determined on the basis that in the maximum or limiting case the inspection regime shall be no more intensive than is necessary and sufficient to maintain continuity of knowledge of the flow and inventory of *nuclear material*.

INFCIRC/153 Paragraph 80

...the maximum routine inspection effort in respect of *facilities* with a content or *annual throughput* of *nuclear material* exceeding five effective kilograms shall be determined as follows:

(a) For reactors and sealed stores, the maximum total of routine inspection per year shall be determined by allowing one sixth of a *man year of inspection* for each such *facility* in the State;

(b) For other *facilities* involving plutonium or uranium enriched to more than 5%, the maximum total of routine inspection per year shall be determined by allowing for each such *facility* $30 \times E^{1/2}$ man-days of inspection per year, where E is the inventory or annual throughput of *nuclear material*, whichever is greater, expressed in effective kilograms. The maximum established for any such *facility* shall not, however, be less than 1.5 man-years of inspection; and

(c) For all other facilities, the maximum total of routine inspection per year shall be determined by allowing for each such *facility* one third of a man-year of inspection plus 0.4 X E man-days of inspection per year, where E is the inventory or annual throughput of *nuclear material*, whichever is greater, expressed in effective kilograms.

The Agreement should further provide that the Agency and the State may agree to amend the maximum figures specified in this paragraph upon determination by the Board that such amendment is reasonable.

INFCIRC/153 Paragraph 81

Subject to paragraphs 78-80 above the criteria to be used for determining the actual number, intensity, duration, timing and mode of routine inspections of any *facility* shall include:

(a) The form of *nuclear material*, in particular, whether the material is in bulk form or contained in a number of separate items; its chemical composition and, in the case of uranium, whether it is of low or high *enrichment*; and its accessibility;

(b) The effectiveness of the State's accounting and control system, including the extent to which the operators of *facilities* are functionally independent of the State's accounting and control system; the extent to which the [accounting and control] measures... have been implemented by the State; the promptness of reports submitted to the Agency; their consistency with the Agency's independent verification; and the amount and accuracy of the *material unaccounted for*, as verified by the Agency;

(c) Characteristics of the State's nuclear fuel cycle, in particular, the number and types of *facilities* containing *nuclear material* subject to safeguards, the characteristics of such *facilities* relevant to safeguards, notably the degree of containment; the extent to which the design of such *facilities* facilitates verification of the flow and inventory of *nuclear material*; and the extent to which information from different *material balance areas* can be correlated;

(d) International interdependence, in particular, the extent to which *nuclear material* is received from or sent to other States for use or processing; any verification activity by the Agency in connection therewith; and the extent to which the State's nuclear activities are interrelated with those of other States; and

(e) Technical developments in the field of safeguards, including the use of statistical techniques and random sampling in evaluating the flow of *nuclear material*.

INFCIRC/153 Paragraph 82

The Agreement should provide for consultation between the Agency and the State if the latter considers that the inspection effort is being deployed with undue concentration on particular *facilities*.

INFCIRC/153 Paragraph 83 (mod SQP)

The Agreement should provide that the Agency shall give advance notice to the State before arrival of inspectors at *facilities* or *material balance areas* outside *facilities*, as follows:

(a) For ad hoc inspections pursuant to sub-paragraph 71(c) [material to be transferred]..., at least 24 hours, for those pursuant to sub-paragraphs 71(a) and (b) [to verify the initial report], as well as the activities provided for in paragraph 48 [to verify design information], at least one week;

(b) For special inspections..., as promptly as possible after the Agency and the State have consulted... it being understood that notification of arrival normally will constitute part of the consultations; and

(c) For routine inspections..., at least 24 hours in respect of the *facilities* [involving plutonium or uranium enriched to more than 5%] ...and sealed stores containing plutonium or uranium enriched to more than 5%, and one week in all other cases.

Such notice of inspections shall include the names of the inspectors and shall indicate the *facilities* and the *material balance areas* outside *facilities* to be visited and the periods during which they will be visited. If the inspectors are to arrive from outside the State the Agency shall also give advance notice of the place and time of their arrival in the State.

Model Subsidiary Arrangements 4.2.2

Notice by the Agency whether or not it intends to inspect *nuclear material* in connection with international transfers should be provided immediately after receipt of any notification pursuant to Code 3.6.

INFCIRC/153 Paragraph 84

... In performing any unannounced inspections, the Agency shall fully take into account any operational programme provided by the State pursuant to paragraph 64(b). Moreover, whenever practicable, and on the basis of the operational programme, it shall advise the State periodically of its general programme of announced and unannounced inspections, specifying the general periods when inspections are foreseen. In carrying out any unannounced inspections, the Agency shall make every effort to minimize any practical difficulties for *facility* operators and the State, bearing in mind the relevant provisions of paragraphs 44 above and 89 below.

Model Subsidiary Arrangements 4.2.1

General programme of announced and unannounced inspections, if adequate advance information on operational programme is contained in concise notes, [should be provided] semi-annually with subsequent adjustments as necessary.

10.4. Complementary access

A State with an AP is required to provide information to the IAEA on a regular basis. This information is evaluated by the IAEA and compared with all other information known about the State. The IAEA may confirm the information provided under an AP, as appropriate, during complementary access (e.g. through activities such as visual observation, collection of environmental samples, and utilization of radiation detection and measurement devices.) Visual observation permits the taking of photographs (digital or other) as part of that activity. The IAEA is required to give States advance notice for complementary access, in accordance with Article 4 of INFCIRC/540. In addition to locations associated with State declarations under an AP, complementary access may also be requested to any location in the State. An AP establishes requirements regarding the implementation of complementary access.

INFCIRC/540 Article 4

The following shall apply in connection with the implementation of complementary access under Article 5 of this Protocol:

- a. The Agency shall not mechanistically or systematically seek to verify the information referred to in Article 2;
...
- b. (i) Except as provided in paragraph (ii) below, the Agency shall give [the State] advance notice of access of at least 24 hours;
(ii) For access to any place on a *site* that is sought in conjunction with design information verification visits or ad hoc or routine inspections on that *site*, the period of advance notice shall, if the Agency so requests, be at least two hours but, in exceptional circumstances, it may be less than two hours.
- c. Advance notice shall be in writing and shall specify the reasons for access and the activities to be carried out during such access.
- d. In the case of a question or inconsistency, the Agency shall provide [the State] with an opportunity to clarify and facilitate the resolution of the question or inconsistency. Such an opportunity will be provided before a request for access, unless the Agency considers that delay in access would prejudice the purpose for which the access is sought. In any event, the Agency shall not draw any conclusions about the question or inconsistency until [the State] has been provided with such an opportunity.
- e. Unless otherwise agreed to by [the State], access shall only take place during regular working hours.

INFCIRC/540 Article 9

[The State] shall provide the Agency with access to locations specified by the Agency to carry out *wide-area environmental sampling*, provided that if [The State] is unable to provide such access it shall make every reasonable effort to satisfy Agency requirements at alternative locations. The Agency shall not seek such access until the use of *wide-area environmental sampling* and the procedural arrangements therefor have been approved by the Board and following consultations between the Agency and [The State].

10.5. Statements on IAEA activities

Following an inspection, the IAEA provides the SRA with a statement describing the results of the inspection. This is called a 90(a) statement after paragraph 90(a) of INFCIRC/153. After performing a physical inventory verification and evaluating the material balance, the IAEA provides the SRA with a report regarding the conclusions it has drawn for the MBA. This is called a 90(b) statement. Likewise, for States with an AP, the IAEA provides a 10(a) statement to the SRA describing activities carried out under the AP, no more than 60 days following the conduct of the activity. The results of activities carried out to address a question or inconsistency are provided to the SRA in a 10(b) statement as soon as possible but no more than 30 days after the results have been established. Conclusions drawn from activities carried out under an AP are provided to the SRA in a 10(c) statement on an annual basis. The IAEA does not provide information directly to facility operators regarding inspections carried out at a facility. However, the SRA may wish to communicate the results of inspections and complementary access to facility operators, both to promote continuous improvement and to acknowledge high quality performance.

Each year, the IAEA summarizes and reports the results of safeguards implementation to the IAEA Board of Governors in the IAEA Safeguards Implementation Report (SIR). The results are aligned with the three safeguards objectives common to all States with CSAs and are based on activities carried out under both CSAs and APs.

INFCIRC/153 Paragraph 5

The Agreement should provide that the Agency shall take every precaution to protect commercial and industrial secrets and other confidential information coming to its knowledge in the implementation of the Agreement. The Agency shall not publish or communicate to any State, organization or person any information obtained by it in connection with the implementation of the Agreement, except that specific information relating to such implementation in the State may be given to the Board of Governors and to such Agency staff members as require such knowledge by reason of their official duties in connection with safeguards, but only to the extent necessary for the Agency to fulfil its responsibilities in implementing the Agreement. Summarized information on nuclear material being safeguarded by the Agency under the Agreement may be published upon decision of the Board if the States directly concerned agree.

INFCIRC/153 Paragraph 30

The Agreement should provide that the technical conclusion of the Agency's verification activities shall be a statement, in respect of each *material balance area*, of the amount of material unaccounted for over a specific period, giving the limits of accuracy of the amounts stated.

INFCIRC/153 Paragraph 90 (mod SQP)

The Agreement should provide that the Agency shall inform the State of:

- (a) The results of inspections at intervals to be specified in the Subsidiary Arrangements; and
- (b) The conclusions it has drawn from its verification activities in the State, in particular by means of statements in respect of each *material balance area* which shall be made as soon as possible after a *physical inventory* has been taken and verified by the Agency and a material balance has been struck.

Model Subsidiary Arrangements 4.1.3

A summary statement on the result of each inspection [should be provided] ... within 60 days after each inspection. A statement of the conclusions the Agency has drawn...should be provided within 60 days after the end of the month in which the Agency has verified the *physical inventory*.

INFCIRC/153 Paragraph 41 (mod SQP)

The Agreement should provide that on the basis of the initial report referred to in paragraph 62 below, the Agency shall establish a unified inventory of all *nuclear material* in the State subject to safeguards under the Agreement, irrespective of its origin, and maintain this inventory on the basis of subsequent reports and of the results of its verification activities. Copies of the inventory shall be made available to the State at agreed intervals.

INFCIRC/153 Paragraph 66

The Agreement should provide, with respect to *nuclear material* subject to safeguards thereunder, for notification of transfers of such material out of the State, in accordance with the provisions set out in paragraphs 92—94 below. The Agency shall terminate safeguards under the Agreement on *nuclear material* when the recipient State has assumed responsibility therefor, as provided for in paragraph 91. The Agency shall maintain records indicating each transfer and, where applicable, the re-application of safeguards to the transferred *nuclear material*.

Model Subsidiary Arrangements 4.1.1

[The Agency shall provide a] statement on inventory of *nuclear material* for [the State] as based on the reports provided by [the State] semi-annually, as of [30 June] and [31 December], not later than 3 months after these dates.

INFCIRC/153 Paragraph 12

The Agreement should provide that the Agency shall terminate safeguards under the Agreement on *nuclear material* [transferred out of the State] when the recipient State has assumed responsibility therefore.... The Agency shall maintain records indicating each transfer and, where applicable, the re-application of safeguards to the transferred *nuclear material*.

Model Subsidiary Arrangements 4.1.1

[A] statement on domestic and international transfers of *nuclear material* reported by [the State] for which the Agency has been unable to match the corresponding reporting from the partner MBA or Country [shall be provided] semi-annually...

INFCIRC/540 Article 10

The Agency shall inform [the State] of:

- a. The activities carried out under this Protocol, including those in respect of any questions or inconsistencies the Agency had brought to the attention of [the State], within sixty days of the activities being carried out by the Agency.

- b. The results of activities in respect of any questions or inconsistencies the Agency had brought to the attention of [the State], as soon as possible but in any case within thirty days of the results being established by the Agency.
- c. The conclusions it has drawn from its activities under this Protocol. The conclusions shall be provided annually.

Model Subsidiary Arrangements 5

5.1 The Agency may publish the following summarized information:

1. The approximate total amounts and the types of nuclear material subject to safeguards in [the State]...
2. A list of the facilities in [the State] which contain nuclear material subject to safeguards...

The list may also contain for each facility the official description and/or name, and the location.

INFCIRC/153 Paragraph 18

The Agreement should provide that if the Board, upon report of the Director General, decides that an action by the State is essential and urgent in order to ensure verification that nuclear material subject to safeguards under the Agreement is not diverted to nuclear weapons or other nuclear explosive devices the Board shall be able to call upon the State to take the required action without delay, irrespective of whether the procedures for the settlement of a dispute have been invoked.

INFCIRC/153 Paragraph 19

The Agreement should provide that if the Board upon examination of relevant information reported to it by the Director General finds that the Agency is not able to verify that there has been no diversion of nuclear material required to be safeguarded under the Agreement to nuclear weapons or other nuclear explosive devices, it may make the reports provided for in paragraph C of Article XII of the Statute and may also take, where applicable, the other measures provided for in that paragraph. In taking such action the Board shall take account of the degree of assurance provided by the safeguards measures that have been applied and shall afford the State every reasonable opportunity to furnish the Board with any necessary reassurance.

10.6. Outcomes of implementing the required activities

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540
IAEA Authorities and Responsibilities			
Information used by the IAEA in drawing safeguards conclusions is independently attained and/or validated.	IAEA	7	
The IAEA establishes and implements policies and procedures to protect States' confidential information and takes precautions to ensure that such information is not revealed through IAEA communications and publications, except that specific information related to safeguards implementation is given to the Board of Governors and IAEA staff members as required.	IAEA	9	15, 14, 6
Safeguards implementation is conducted in a manner designed to avoid hampering international commerce or restricting growth and development in peaceful uses of nuclear material.	IAEA	9, 87	
IAEA inspectors adhere to operational, safety and radiation protection rules established at each facility, do not take part in facility operations, and do not direct facility staff. Facility operators and the SRA are responsible for facilitating inspections and for inspector safety.	IAEA	87	
The State's capabilities and other factors are taken into consideration in designing the State-specific safeguards approach to meet objectives in an efficient manner.	IAEA	81	
The safeguards approach, material balance areas, strategic points and safeguards measures for a facility are determined	IAEA	46, 47, 50, 29	

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540
based on the examination and verification of design information, and information regarding the requirements and procedures for physical inventory taking.			
Safeguards approaches continually evolve to apply modern technological advancements and practices to optimize effectiveness and efficiency, and take account of experiences gained in the implementation of safeguards.	IAEA	6	
Inspection activities are determined taking into account all information known about a State, the State's notifications, the facility's operational programme, nuclear material characteristics and facility features.	IAEA	8, 70, 78, 82	
The IAEA's programme of inspections is periodically communicated to the State.	IAEA		
The inspection effort is based on a comprehensive evaluation of all information, taking into account factors such as the quantity and form of nuclear material, and the IAEA's ability to meet its objectives.	IAEA	79, 80, 81, 84	
All information known about a State is evaluated to determine when and where complementary access is performed.	IAEA		4
Each State is afforded an opportunity to resolve questions or inconsistencies concerning its declarations.	IAEA		4
States are provided with timely advance notification of complementary access as required, and the opportunity to use managed access.	IAEA		4
Complementary access is conducted during normal working hours unless previously agreed with the State.	IAEA		4
Each State is kept informed in a timely manner on the results and findings of inspections and the activities carried out under its AP and corresponding results.	IAEA	10, 30, 90	10
Each year, the IAEA provides information to the Board of Governors regarding the implementation of IAEA safeguards.	IAEA	5	
Each State is kept informed in a timely manner of the book inventory maintained by the IAEA for that State.	IAEA	12, 41, 66, SA 4.1.3	
The IAEA's intention to verify international transfers is announced to the respective State.	IAEA	SA 4.2.2	
Each States is notified regarding unmatched transfers of nuclear material exported from that State.	IAEA	12, SA 4.1.1	

11. RESPONSIBILITIES SHARED BY THE STATE AND THE IAEA

11.1. Establishing the point of contact for IAEA communications

Effective communication between the SRA and the IAEA facilitates the timely submission of accurate information, unobstructed conduct of inspections, resolution of problems, and development of a shared understanding of the needs of both parties to meet objectives. The

IAEA Secretariat needs a single organizational point of contact in the State with whom to exchange safeguards-related communications, and that point of contact must have established good communication channels with other parts of the government, as appropriate, to facilitate safeguards implementation. For example, Ministries of Foreign Affairs, Energy and Natural Resources, Industry, Science, and Education often play a role in carrying out obligations of the State under its CSA and AP. The SRA should establish effective communications with all entities possessing nuclear material, such as facility operators, universities, research and development institutions, hospitals, and other public and private entities.

The IAEA also has an obligation to follow the official communication channels established with the State and specified in the Subsidiary Arrangements. As shown below, the State may wish to define one point of contact within its Mission to the IAEA for routing communications to the SRA, and a direct point of contact for working-level communications between inspectors and State authorities.

In the event that Subsidiary Arrangements have not been concluded between the IAEA and the State (which sometimes is the case for States with an SQP), the SRA should direct communications to the appropriate IAEA country officer. The SRA may use the official IAEA email address (official.mail@iaea.org) until the direct email address within the Department of Safeguards has been communicated to the SRA.

<p>Model Subsidiary Arrangements 1 (Communication from IAEA to State)</p> <p>1.1.1. Normally, on matters relating to implementation of the Agreement and Subsidiary Arrangements – Name and Address [of State safeguards point of contact]</p> <p>1.1.2. Routing of communications to authority under Code 1.1.1. – Name and Address: [Direct] [Mission in Vienna] [other]</p> <p>1.1.3. Normal contact between Agency inspectors in [the State] and [the State]'s authorities – Name and Address: [of State safeguards point of contact under Code 1.1.1 or its representatives at each facility or material balance area outside facility]</p>
<p>Model Subsidiary Arrangements 1 (Communication from State to IAEA)</p> <p>1.2.1. Normally, on matters relating to implementation of Agreement and Subsidiary Arrangements – Name and Address: The Director General, International Atomic Energy Agency, Wagramer Strasse 5, A-1400 Vienna, Austria, Telephone: +43 1 2600, Facsimile: +43 1 26007, Email: Official.Mail@iaea.org [or Agency staff member shown by previous communications to be authorized to deal with subject matter]</p> <p>1.2.2. Contact in case of accidents or other emergencies involving Agency inspectors – Name and Address: [Official Designated by the Agency]</p>

11.2. Protection and communication of information

States provide the IAEA with detailed information about nuclear material and facilities, which, if misused could pose a threat to the State's national security or the competitiveness of its nuclear industry. Under both a CSA and an AP, the IAEA is required to protect State-provided safeguards information, and has implemented a comprehensive system of classification and access controls¹⁷ to ensure these requirements are rigorously adhered to.

Each State is required under its AP to permit and protect free communications by the IAEA inspectors in the State, including attended and unattended transmission of information generated by IAEA equipment.

¹⁷ The latest briefing to the Board of Governors regarding the IAEA's information security programme is published in SECNOTE/60, which can be accessed by Member States on GovAtom as 2010/Note60 dated 23 November 2010.

INFCIRC/153 Paragraph 9

... The visits and activities of Agency inspectors shall be so arranged as to ... ensure protection of industrial secrets or any other confidential information coming to the inspectors' knowledge.

INFCIRC/540 Article 14

a. [The State] shall permit and protect free communications by the Agency for official purposes between Agency inspectors in [the State] and Agency Headquarters and/or Regional Offices, including attended and unattended transmission of information generated by Agency containment and/or surveillance or measurement devices. The Agency shall have, in consultation with [the State], the right to make use of internationally established systems of direct communications, including satellite systems and other forms of telecommunication, not in use in [the State]. At the request of [the State] or the Agency, details of the implementation of this paragraph with respect to the attended or unattended transmission of information generated by Agency containment and/or surveillance or measurement devices shall be specified in the Subsidiary Arrangements.

b. Communication and transmission of information ... shall take due account of the need to protect proprietary or commercially sensitive information or design information which [the State] regards as being of particular sensitivity.

INFCIRC/540 Article 15

a. The Agency shall maintain a stringent regime to ensure effective protection against disclosure of commercial, technological and industrial secrets and other confidential information coming to its knowledge, including such information coming to the Agency's knowledge in the implementation of this Protocol.

b. The regime referred to in paragraph a. above shall include, among others, provisions relating to:

- (i) General principles and associated measures for the handling of confidential information;
- (ii) Conditions of staff employment relating to the protection of confidential information;
- (iii) Procedures in cases of breaches or alleged breaches of confidentiality.

c. The regime referred to in paragraph a. above shall be approved and periodically reviewed by the Board.

11.3. Designation of IAEA inspectors

The IAEA is required to designate inspectors for each State, through a formal process, and States are required to respond to inspector designations. The designation of inspectors is an important component of efficient planning and implementation of safeguards activities at the IAEA. Safeguards implementation can be disrupted if States are slow to respond or refuse requests for inspector designation. For many States, inspectors are accepted as designated unless specifically rejected by the State, which is an approach preferred by the IAEA, and required by an AP.

INFCIRC/153 Paragraph 9

...The Agency shall secure the consent of the State to the designation of Agency inspectors to that State. If the State, either upon proposal of a designation or at any other time after a designation has been made, objects to the designation, the Agency shall propose to the State an alternative designation or designations. The repeated refusal of a State to accept the designation of Agency inspectors which would impede the inspections conducted under the Agreement would be considered by the Board upon referral by the Director General with a view to appropriate action.

INFCIRC/153 Paragraph 85 (mod SQP)

The Agreement should provide that:

- (a) The Director General shall inform the State in writing of the name, qualifications, nationality, grade and such other particulars as may be relevant, of each Agency official he proposes for designation as an inspector for the State;
- (b) The State shall inform the Director General within 30 days of the receipt of such a proposal whether it accepts the proposal;
- (c) The Director General may designate each official who has been accepted by the State as one of the inspectors for the State, and shall inform the State of such designations; and
- (d) The Director General, acting in response to a request by the State or on his own initiative, shall immediately inform the State of the withdrawal of the designation of any official as an inspector for the State.

The Agreement should also provide, however, that in respect of inspectors needed for the purposes stated in paragraph 48 and to carry out ad hoc inspections pursuant to sub-paragraphs 71(a) and (b) the designation

procedures shall be completed if possible within 30 days after the entry into force of the Agreement. If such designation appears impossible within this time limit, inspectors for such purposes shall be designated on a temporary basis.

INFCIRC/540 Article 11

- a. (i) The DG shall notify [the State] of the Board's approval of any Agency official as a safeguards inspector. Unless [the State] advises the DG of its rejection of such an official as an inspector for [the State] within three months of receipt of notification of the Board's approval, the inspector so notified to [the State] shall be considered designated to [the State];
- (ii) The DG, acting in response to a request by [the State] or on his own initiative, shall immediately inform [the State] of the withdrawal of the designation of any official as an inspector for [the State].
- b. A notification referred to in paragraph [11.a. above] shall be deemed to be received by [the State] seven days after the date of the transmission by registered mail of the notification by the Agency to [the State].

11.4. Visas

Most States require visas for entry of foreign nationals, and accordingly, inspectors entering those States to conduct verification activities or for other reasons must have a valid visa. Multiple entry/exit and/or transit visas are important for facilitating unannounced and short-notice inspections and for providing the IAEA flexibility in deploying its inspectors. Should the IAEA have to request a visa in advance of inspectors visiting the State, then the element of surprise would be eliminated. Therefore, CSAs and APs require States to issue multiple entry/exit and/or transit visas valid for at least one-year to all designated inspectors for that State.

INFCIRC/153 Paragraph 86 (mod SQP)

The Agreement should provide that the State shall grant or renew as quickly as possible appropriate visas, where required, for each inspector designated for the State.

Model Subsidiary Arrangements Code 9.2 (reference to paragraphs 9(b), 10, 86)

Note 1. If designated inspectors need visas, they will be granted them for multiple entry and exit of at least one year's validity, without undue delay and free of charge.

Note 2. The Agency shall ensure that the inspector's travel document is valid for the period to be covered by the visa.

INFCIRC/540 Article 12

[The State] shall, within one month of the receipt of a request therefore, provide the designated inspector specified in the request with appropriate multiple entry/exit and/or transit visas, where required, to enable the inspector to enter and remain on the territory of [the State] for the purpose of carrying out his/her functions. Any visas required shall be valid for at least one year and shall be renewed, as required, to cover the duration of the inspector's designation to [the State].

11.5. Sharing of costs

In the implementation of safeguards, the IAEA and States each bear their associated costs. However, some costs borne by the State may be reimbursed by the IAEA, should these costs be deemed to be extraordinary and reimbursement has been agreed upon between the IAEA and the State in advance. The Facility Attachment for each facility lists the services and activities for which the IAEA may agree to reimburse costs incurred by the State¹⁸. States undertake the costs of safe access to facilities on the part of inspectors, including the provision of radiological controls, monitoring and facility-specific training. States that are not members of the IAEA are required to reimburse the IAEA for IAEA costs incurred in the implementation of safeguards.

¹⁸ The description of charges incurred and whether or not they are reimbursable is found in GOV/INF/577 of 18 January 1990 *Policy in Implementation of Financial Clauses in Safeguards Agreements*.

INFCIRC/153 Paragraph 15

The Agreement should contain one of the following sets of provisions:

- (a) An agreement with a Member of the Agency should provide that each party thereto shall bear the expenses it incurs in implementing its responsibilities thereunder. However, if the State or persons under its jurisdiction incur extraordinary expenses as a result of a specific request by the Agency, the Agency shall reimburse such expenses provided that it has agreed in advance to do so. In any case the Agency shall bear the cost of any additional measuring or sampling which inspectors may request; or
- (b) An agreement with a party not a Member of the Agency should in application of the provisions of Article XIV.C of the Statute, provide that the party shall reimburse fully to the Agency the safeguards expenses the Agency incurs thereunder. However, if the party or persons under its jurisdiction incur extraordinary expenses as a result of a specific request by the Agency, the Agency shall reimburse such expenses provided that it has agreed in advance to do so.

11.6. Privileges and immunities and protection from liability

All States in which IAEA safeguards are implemented are required to extend certain privileges and immunities to the inspectors while they are in the State. These include protection against search, requisition, confiscation and other forms of interference with IAEA equipment, data, documents and other information. States are protected against IAEA requests or actions that exceed the scope of application of a CSA and an AP.

INFCIRC/153 Paragraph 10

The Agreement should provide the privileges and immunities which shall be granted to the Agency and its staff in respect of their functions under the Agreement. In the case of a State party to the Agreement on the Privileges and Immunities of the Agency¹⁹ the provisions thereof, as in force for such State, shall apply. In the case of other States, the privileges and immunities granted should be such as to ensure that:

- (a) The Agency and its staff will be in a position to discharge their functions under the Agreement effectively; and
- (b) No such State will be placed thereby in a more favourable position than States party to the Agreement on the Privileges and Immunities of the Agency.

In addition, IAEA staff are protected against third-party liability in respect of nuclear damage in the State, in accordance with the State's laws, in the same way that the protection applies to the nationals of the State.

INFCIRC/153 Paragraph 16

The Agreement should provide that the State shall ensure that any protection against third party liability in respect of nuclear damage, including any insurance or other financial security, which may be available under its laws or regulations shall apply to the Agency and its officials for the purpose of the implementation of the Agreement, in the same way as that protection applies to nationals of the State.

INFCIRC/153 Paragraph 17

The Agreement should provide that any claim by one party [to the Agreement] against the other in respect of any damage, other than damage arising out of a nuclear incident, resulting from the implementation of safeguards under the Agreement, shall be settled in accordance with international law.

11.7. Interpretation and application of the agreement

Procedures to be followed by States and the IAEA are set out in INFCIRC/153 with respect to questions arising from the interpretation or application of the agreement, and provide a process (arbitration) to address disputes.

¹⁹ Agreement on the Privileges and Immunities of the Agency, INFCIRC/9/Rev2.

INFCIRC/153 Paragraph 20

The Agreement should provide that the parties thereto shall, at the request of either, consult about any question arising out of the interpretation or application thereof.

INFCIRC/153 Paragraph 21

The Agreement should provide that the State shall have the right to request that any question arising out of the interpretation or application thereof be considered by the Board; and that the State shall be invited by the Board to participate in the discussion of any such question by the Board.

INFCIRC/153 Paragraph 22

The Agreement should provide that any dispute arising out of the interpretation or application thereof except a dispute with regard to a finding by the Board under paragraph 19 above or an action taken by the Board pursuant to such a finding which is not settled by negotiation or another procedure agreed to by the parties should, on the request of either party, be submitted to an arbitral tribunal composed as follows: each party would designate one arbitrator, and the two arbitrators so designated would elect a third, who would be the Chairman. If, within 30 days of the request for arbitration, either party has not designated an arbitrator, either party to the dispute may request the President of the International Court of Justice to appoint an arbitrator. The same procedure would apply if, within 30 days of the designation or appointment of the second arbitrator, the third arbitrator had not been elected. A majority of the members of the arbitral tribunal would constitute a quorum, and all decisions would require the concurrence of two arbitrators. The arbitral procedure would be fixed by the tribunal. The decisions of the tribunal would be binding on both parties.

INFCIRC/153 Paragraph 27

The Agreement should provide that the purpose of Part II thereof is to specify the procedures to be applied for the implementation of the safeguards provisions of Part I.

11.8. Other provisions

CSAs and APs also have provisions on entry into force and duration. They define procedures for important but infrequently exercised actions, such as amendment of the agreement or protocol. The AP also provides that, in the case of a conflict between the provisions of the CSA and AP, the provisions of the AP shall apply.

INFCIRC/153 Paragraph 25

The Agreement should provide that it shall enter into force on the date on which the Agency receives from the State written notification that the statutory and constitutional requirements for entry into force have been met. The Director General shall promptly inform all Member States of the entry into force.

INFCIRC/540 Article 17

a. This Protocol shall enter into force on the date on which the Agency receives from [the State] written notification that [the State]'s statutory and/or constitutional requirements for entry into force have been met or upon signature by the representatives of [the State] and the Agency.

b. [The State] may, at any date before this Protocol enters into force, declare that it will apply this Protocol provisionally.

c. The Director General shall promptly inform all Member States of the Agency of any declaration of provisional application of, and of the entry into force of, this Protocol.

INFCIRC/153 Paragraph 23

The Agreement should provide that the parties thereto shall, at the request of either of them, consult each other on amendment of the Agreement. All amendments shall require the agreement of both parties. It might additionally be provided, if convenient to the State, that the agreement of the parties on amendments to Part II of the Agreement could be achieved by recourse to a simplified procedure. The Director General shall promptly inform all Member States of any amendment to the Agreement.

INFCIRC/153 Paragraph 24

Where applicable and where the State desires such a provision to appear, the Agreement should provide that the application of Agency safeguards in the State under other safeguards agreements with the Agency shall be suspended while the Agreement is in force. If the State has received assistance from the Agency for a project, the State's undertaking in the Project Agreement not to use items subject thereto in such a way as to further any military purpose shall continue to apply.

INFCIRC/153 Paragraph 26

The Agreement should provide for it to remain in force as long as the State is party to the Treaty on the Non-Proliferation of Nuclear Weapons.

Model Subsidiary Arrangements Preamble

These Subsidiary Arrangements may be amended or supplemented by exchange of notes between the

Government of [the State] and the Agency. These Subsidiary Arrangements enter into force on [the date]. Amendments and supplements to these Subsidiary Arrangements enter into force on the dates specified in the notes.

INFCIRC/540 Article 1

The provisions of the Safeguards Agreement shall apply to this Protocol to the extent that they are relevant to and compatible with the provisions of this Protocol. In case of conflict between the provisions of the Safeguards Agreement and those of this protocol, the provisions of this Protocol shall apply.

INFCIRC/540 Article 16

- a. The Annexes to this Protocol shall be an integral part thereof. Except for the purposes of amendment of the Annexes, the term "Protocol" as used in this instrument means the Protocol and the Annexes together.
- b. The list of activities specified in Annex I, and the list of equipment and material specified in Annex II, may be amended by the Board upon the advice of an open-ended working group of experts established by the Board. Any such amendment shall take effect four months after its adoption by the Board.

11.9. Outcomes of implementing the required activities

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras of INFCIRC/ 153 and SA	Refers to Articles of INFCIRC/ 540
Responsibilities Shared Between the IAEA and the State			
Points of contact have been designated by the State, who have authority and responsibility to communicate with the IAEA on all safeguards matters.	All States with CSAs	7, SA 1	
The IAEA directs communications to the State in accordance with the agreed procedures, and to the appropriate points of contact.	IAEA	7, SA 1	
As necessary, the State's points of contact communicate with other institutions within the State to address IAEA requests which require coordination (e.g., inspector designations, visa issuance, data collection).	All States with CSAs	7, SA 1	
IAEA inspectors and their equipment and systems are able to transmit information out of the State as necessary to implement safeguards.	AP		14.a.
The IAEA establishes a programme for information security, and its procedures are documented, audited and subject to review by the Board of Governors.	AP		15
When so requested, sensitive design information is reviewed by the IAEA on the premises of the State or operator.	States with CSAs and no SQP	8	
Summary information regarding materials and facilities subject to safeguards in States is reported to the Board of Governors, as necessary, to keep it informed of Agency activities and findings.	IAEA	5	
Agency staff to be used as inspectors are designated by the Director General and approved by the Board of Governors.	IAEA, BOG	85	
Each State is afforded the opportunity to reject specific inspectors designated to conduct inspections in that State. States whose continued rejection of inspectors impedes safeguards implementation are reported to the Board of Governors.	All States with CSAs	9, 85	11
Designated inspectors are provided one-year or longer, multiple entry/exit visas, by each State in a timely manner.	All States with CSAs	86, SA Code 9	12
The State and the IAEA each provides for its own expenses incurred in the implementation of safeguards, and the IAEA reimburses the State for the costs of services, as agreed in advance	All States with CSAs,	15	

Outcomes of Implementing the Required Activities	Applies to:	Refers to Paras of INFCIRC/ 153 and SA	Refers to Articles of INFCIRC/ 540
by the IAEA.	IAEA		
IAEA staff are provided all necessary privileges and immunities in accordance with the provisions of the agreement.	All States with CSAs	10, 16, 17	
Questions of interpretation or application of a CSA that cannot be resolved directly between the IAEA and the State are resolved through discussions of the Board of Governors.	All States with CSAs, IAEA, BOG	20, 21, 22, 27	
States and the IAEA make arrangements to enable safeguards objectives to be met, in case unusual circumstances require limitations of access.	All States with CSAs, IAEA	76	
The text of all CSAs and amendments thereto are made available to all Member States.	IAEA	5	
CSAs, APs and Subsidiary Arrangements are brought into force upon notification to the IAEA by the State, or as provided therein.	All States with CSAs	25, 39, 40	17
Amendments to CSAs, APs, and Subsidiary Arrangements are approved by both the State and the IAEA before entering into force.	All States with CSAs, IAEA	23, SA Preamble	

12. OTHER RESOURCES AVAILABLE TO STATES

The IAEA offers States a variety of assistance, services and training courses. In addition to periodic training courses designed for SRAs, facility operators and others in States, the IAEA is making available guides, self-assessment tools, topical handbooks, advisory services and legislative assistance. Information on these resources can be found at www.iaea.org. Educational materials available on the IAEA website can be useful for training in IAEA safeguards and other nuclear-related areas, including nuclear and radiation safety, environmental protection, and nuclear security.

Additionally, States may request an ‘IAEA SSAC Advisory Service’ mission to evaluate and make recommendations on measures to strengthen the State’s safeguards infrastructure. The purpose, structure and scope of the ISSAS missions are described in *The ISSAS guidelines* [16]. The IAEA Office of Legal Affairs provides legislative assistance to States upon request on the establishment of laws and regulations in the area of nuclear safeguards, import and export controls, nuclear safety and security and liability for nuclear damage, and has published handbooks on these topics for the use of States.

The IAEA Physical Protection Advisory Service offered through the Department of Nuclear Safety and Nuclear Security, and the Integrated Nuclear Infrastructure Review service, offered through the IAEA’s Office of Nuclear Energy, also provide external peer review missions carried out by the IAEA upon request by a State. These missions evaluate such issues as the State’s protection of its nuclear and radioactive materials and installations, and assess the development of the national nuclear power programme. The missions may also offer support in safeguards infrastructure as well as many other elements of nuclear programme development. States and non-governmental organizations (professional societies, international organizations) are important sources of assistance and advice on safeguards implementation ‘good practice.’

The establishment of an effective SRA and safeguards infrastructure requires financial resources. While the IAEA cannot provide funding directly to States, there are several mechanisms through which it can assist them. For example, the IAEA's programme of technical assistance and cooperation can consider project proposals to develop infrastructures, such as supplying computer and communications equipment, and establishing radiation monitoring systems. Technical assistance can also be sought by States through the IAEA's Technical Cooperation programme, for training in accounting for and controlling nuclear material, transportation, nuclear materials management, nuclear safety, and other areas, and for equipment such as workstations and network/communications devices. An SRA should direct inquiries regarding opportunities for training, advisory services and assistance, to its relevant country officer.

The IAEA's Member State Support Programmes to IAEA safeguards often establish projects to support the needs of States in implementing safeguards obligations, including the development and provision of equipment and software, and the conduct of training courses, seminars and workshops.

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Note: Many of the referenced documents below can be found for convenience at www.iaea.org/Safeguards/.

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DEFINITIONS

Several terms are defined in INFCIRC/153 and INFCIRC/540 and are provided below for convenience. The IAEA Safeguards Glossary²⁰ provides definitions of other safeguards terms; only those defined in INFCIRCs 153 and 540 are included here.

Term	Reference Definition
Adjustment	An entry into an accounting record or a report showing a <i>shipper/receiver difference</i> or <i>material unaccounted for</i> .
Annual Throughput	(for the purpose of paragraphs 79 and 80 of INFCIRC/153) The amount of <i>nuclear material</i> transferred annually out of a <i>facility</i> working at nominal capacity.
Batch	A portion of <i>nuclear material</i> handled as a unit for accounting purposes at a <i>key measurement point</i> and for which the composition and quantity are defined by a single set of specifications or measurements. The <i>nuclear material</i> may be in bulk form or contained in a number of separate items.
Batch Data	The total weight of each element of <i>nuclear material</i> and, in the case of plutonium and uranium, the isotopic composition when appropriate. The units of account shall be as follows: (a) Grams of contained plutonium; (b) Grams of total uranium and grams of contained uranium-235 plus uranium-233 for uranium enriched in these isotopes; and (c) Kilograms of contained thorium, natural uranium or depleted uranium. For reporting purposes the weights of individual items in the <i>batch</i> shall be added together before rounding to the nearest unit.
Book Inventory of a Material Balance Area	The algebraic sum of the most recent <i>physical inventory</i> of that <i>material balance area</i> and of all <i>inventory changes</i> that have occurred since <i>that physical inventory</i> was taken.
Closed Down Facility or Location Outside Facilities (AP)	An installation or location where operations have been stopped and the <i>nuclear material</i> removed but which has not been decommissioned.
Correction	An entry into an accounting record or a report to rectify an identified mistake or to reflect an improved measurement of a quantity previously entered into the record or report. Each correction must identify the entry to which it pertains.
Decommissioned Facility or Decommissioned Location Outside Facilities (AP)	An installation or location at which residual structures and equipment essential for its use have been removed or rendered inoperable so that it is not used to store and can no longer be used to handle, process or utilize <i>nuclear material</i> .
Effective Kilogram	A special unit used in safeguarding <i>nuclear material</i> . The quantity in "effective kilograms" is obtained by taking: (a) For plutonium, its weight in kilograms; (b) For uranium with an <i>enrichment of 0.01 (1%)</i> and above, its weight in kilograms multiplied by the square of its <i>enrichment</i> ; (c) For uranium with an <i>enrichment below 0.01 (1%)</i> and above 0.005 (0.5 %), its weight in kilograms multiplied by 0.0001; and (d) For depleted uranium with an <i>enrichment of 0.005 (0.595%)</i> or below, and for thorium, its weight in kilograms multiplied by 0.00005.
Enrichment	The ratio of the combined weight of the isotopes uranium-233 and uranium -235 to that of the total uranium in question.
Facility	(a) A reactor, a critical facility, a conversion plant, a fabrication plant, a

²⁰ IAEA Safeguards Glossary (2001 Edition), International Nuclear Verification Series 3, Vienna (2002). This document has no legal status and is not intended to serve as a basis for adjudicating on problems of definition such as might arise during the negotiation or in the interpretation of safeguards agreements or additional protocols.

	reprocessing plant, an isotope separation plant or a separate storage installation; or (b) Any location where <i>nuclear material</i> in amounts greater than one <i>effective kilogram</i> is customarily used.
High Enriched Uranium (AP)	Uranium containing 20 percent or more of the isotope uranium-235
Inventory Change	An increase or decrease, in terms of <i>batches</i> of <i>nuclear material</i> in a <i>material balance area</i> ; such a change shall involve one of the following: (a) Increases: (i) Import; (ii) Domestic receipt: receipts from other <i>material balance areas</i> , receipts from a non-safeguarded (non-peaceful) activity or receipts at the starting point of safeguards; (iii) Nuclear production: production of special fissionable material in a reactor; and (iv) De-exemption: reapplication of safeguards <i>on nuclear material</i> previously exempted therefrom on account of its use or quantity. (b) Decreases: (i) Export; (ii) Domestic shipment: shipments to other <i>material balance areas</i> or shipments for a non-safeguarded (non-peaceful) activity; (iii) Nuclear loss: loss of <i>nuclear material</i> due to its transformation into other element(s) or isotope(s) as a result of nuclear reactions; (iv) Measured discard: <i>nuclear material</i> which has been measured, or estimated on the basis of measurements, and disposed of in such a way that it is not suitable for further nuclear use; (v) Retained waste: <i>nuclear material</i> generated from processing or from an operational accident, which is deemed to be unrecoverable for the time being but which is stored; (vi) Exemption: exemption of <i>nuclear material</i> from safeguards on account of its use or quantity; and (vii) Other loss: for example, accidental loss (that is, irretrievable and inadvertent loss of <i>nuclear material</i> as the result of an operational accident) or theft.
Key Measurement Point	A location where <i>nuclear material</i> appears in such a form that it may be measured to determine material flow or inventory. "Key measurement points" thus include, but are not limited to, the inputs and outputs (including measured discards) and storages in <i>material balance areas</i> .
Location Outside Facility (AP)	Any installation or location, which is not a <i>facility</i> , where <i>nuclear material</i> is customarily used in amounts of one <i>effective kilogram</i> or less.
Location-Specific Environmental Sampling (AP)	The collection of environmental samples (e.g., air, water, vegetation, soil, smears) at, and in the immediate vicinity of, a location specified by the Agency for the purpose of assisting the Agency to draw conclusions about the absence of undeclared <i>nuclear material</i> or nuclear activities at the specified location.
Person-year of Inspection	(for the purposes of paragraph 80 of INFCIRC/153) 300 person-days of inspection, a person-day being a day during which a single inspector has access to a <i>facility</i> at any time for a total of not more than eight hours.
Material Balance Area	An area in or outside of a <i>facility</i> such that: (a) The quantity of <i>nuclear material</i> in each transfer into or out of each "material balance area" can be determined; and (b) The <i>physical inventory</i> of <i>nuclear material</i> in each "material balance area" can be determined when necessary, in accordance with specified procedures, in order that the material balance for Agency safeguards purposes can be established.
Material Unaccounted For	The difference between <i>book inventory</i> and <i>physical inventory</i> .
Nuclear Fuel Cycle-Related Research and Development	Those activities which are specifically related to any process or system development aspect of any of the following: - conversion of <i>nuclear material</i> , - enrichment of <i>nuclear material</i> ,

Activities (AP)	<ul style="list-style-type: none"> - nuclear fuel fabrication, - reactors, - critical facilities, - reprocessing of nuclear fuel, - processing (not including repackaging or conditioning not involving the separation of elements, for storage or disposal) of intermediate or high-level waste containing plutonium, <i>high enriched uranium</i> or uranium-233, <p>but do not include activities related to theoretical or basic scientific research or to research and development on industrial radioisotope applications, medical, hydrological and agricultural applications, health and environmental effects and improved maintenance.</p>
Nuclear Material	<p>Any source or any special fissionable material as defined in Article XX of the Statute. The term source material shall not be interpreted as applying to ore or ore residue. Any determination by the Board under Article XX of the Statute after the entry into force of this Agreement which adds to the materials considered to be source material or special fissionable material shall have effect under this Agreement only upon acceptance by the State.</p> <p>Article XX of Statute</p> <p>1. The term "special fissionable material" means plutonium-239; uranium- 233; uranium enriched in the isotopes 235 or 233; any material containing one or more of the foregoing; and such other fissionable material as the Board of Governors shall from time to time determine; but the term "special fissionable material" does not include source material.</p> <p>2. The term "uranium enriched in the isotopes 235 or 233" means uranium containing the isotopes 235 or 233 or both in an amount such that the abundance ratio of the sum of these isotopes to the isotope 238 is greater than the ratio of the isotope 235 to the isotope 238 occurring in nature.</p> <p>3. The term "source material" means uranium containing the mixture of isotopes occurring in nature; uranium depleted in the isotope 235; thorium; any of the foregoing in the form of metal, alloy, chemical compound, or concentrate; any other material containing one or more of the foregoing in such concentration as the Board of Governors shall from time to time determine; and such other material as the Board of Governors shall from time to time determine.</p>
Physical Inventory	<p>The sum of all the measured or derived estimates of <i>batch</i> quantities of <i>nuclear material</i> on hand at a given time within a <i>material balance area</i>, obtained in accordance with specified procedures.</p>
Shipper/Receiver Difference	<p>The difference between the quantity of <i>nuclear material</i> in a <i>batch</i> as stated by the shipping <i>material balance area</i> and as measured at the receiving <i>material balance area</i>.</p>
Site (AP)	<p>That area delimited by [the State] in the relevant design information for a <i>facility</i>, including a <i>closed-down facility</i>, and in the relevant information on a <i>location outside facilities</i> where <i>nuclear material</i> is customarily used, including a <i>closed-down location outside facilities</i> where <i>nuclear material</i> was customarily used (this is limited to locations with hot cells or where activities related to conversion, enrichment, fuel fabrication or reprocessing were carried out).</p> <p>It shall also include all installations, co-located with the <i>facility</i> or location, for the provision or use of essential services, including: hot cells for processing irradiated materials not containing <i>nuclear material</i>; installations for the treatment, storage and disposal of waste; and buildings associated with specified activities identified by [the State] under Article 2.a.(iv) above.</p> <p>(Article 2.a.(iv) requires "A description of the scale of operations for each location engaged in the activities specified in Annex I to this Protocol.")</p>
Source Data	<p>Those data, recorded during measurement or calibration or used to derive empirical relationships, which identify <i>nuclear material</i> and provide <i>batch data</i>. "Source data" may include, for example, weight of compounds, conversion factors to determine weight of element, specific gravity, element concentration, isotopic ratios, relationship between volume and manometer readings and relationship</p>

	between plutonium produced and power generated.
Strategic Point	A location selected during examination of design information where, under normal conditions and when combined with the information from all "strategic points" taken together, the information necessary and sufficient for the implementation of safeguards measures is obtained and verified; a "strategic point" may include any location where key measurements related to material balance accountancy are made and where containment and surveillance measures are executed.
Wide-Area Environmental Sampling (AP)	The collection of environmental samples (e.g., air, water, vegetation, soil, smears) at a set of locations specified by the Agency for the purpose of assisting the Agency to draw conclusions about the absence of undeclared <i>nuclear material</i> or nuclear activities over a wide area.

ABBREVIATIONS

AP	Additional Protocol
CSA	Comprehensive Safeguards Agreement
DIQ	Design Information Questionnaire
DIV	Design Information Verification
FA	Facility Attachment
IAEA	International Atomic Energy Agency
INFCIRC	Information Circular
LOF	Location Outside Facility
MBA	Material Balance Area
NNWS	Non-Nuclear-Weapon States (party to the NPT)
NWS	Nuclear Weapon State (party to the NPT)
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
PIL	Physical Inventory Listing
R&D	Research and Development
RSAC	Regional System of Accounting for and Control of Nuclear Material
SIR	Safeguards Implementation Report
SQP	Small Quantities Protocol
SRA	State (or regional) Authority with responsibility for safeguards implementation
SSAC	State's System of Accounting for and Control of Nuclear Material
VOA	Voluntary Offer Agreement
VRS	Voluntary Reporting Scheme

ANNEX
OUTCOMES OF IMPLEMENTING THE REQUIRED ACTIVITIES

Outcomes of Implementing the Required Activities	Applies to	Refers to Paras in INFCIRC/ 153 and SA	Refers to Articles in INFCIRC/ 540
3. State Safeguards Infrastructure			
<i>Legal and Regulatory Infrastructure</i>			
Laws and regulations are established and maintained in the State, which designate an independent State or regional authority responsible for safeguards (SRA), grant it rights and authorities, and provide it with adequate human, technical and financial resources to carry out the State's safeguards obligations.	All States with CSAs	7	
Regulatory requirements which set forth authorization/licensing requirements for nuclear material use, possession, licensing, transfer, accounting and control are established and implemented in the State.	All States with CSAs	7	
Compliance with regulatory requirements is evaluated and enforced for all possessors of nuclear material in the State or under its jurisdiction.	All States with CSAs	7	
The quantity, use and location of all nuclear material in the State or under its jurisdiction or control are known by the State/SRA and subject to IAEA safeguards.	All States with CSAs	7	
The possession, use, transfer, import, and export of all nuclear material and other items subject to reporting pursuant to a CSA and an AP are controlled by the State, facilitating the State's detection of unauthorized activities involving nuclear material and other items subject to regulatory control.	All States with CSAs	7	
<i>State's System of Accounting for and Control of Nuclear Material</i>			
All nuclear material subject to the full safeguards procedures under a CSA is contained in MBAs and complete records are kept and retained for each MBA as required.	States with CSA and no SQP	32, 51, 53	
MBAs are defined such that all nuclear material can be accounted for and IAEA safeguards objectives can be met.	States with CSA and no SQP	32, 56, 58	
Administrative procedures relating to accounting for and control of nuclear material are effectively implemented at all MBAs and are based on a system of reports, records and measurements that permit the tracking of inventory changes and the closing of material balances.	States with CSA and no SQP	56 SA 2-2.1	
Independent audits of records and measurements of nuclear material are conducted as necessary to validate operator records and assure the quality of reports and declarations provided to the IAEA.	States with CSA and no SQP	SA 2.1.3	
The accuracy and precision of measurements conducted to establish nuclear material accountancy values conform, or are	States with CSA and no	55	

Outcomes of Implementing the Required Activities	Applies to	Refers to Paras in INFCIRC/ 153 and SA	Refers to Articles in INFCIRC/ 540
equivalent, to the latest International Target Values ²¹ for random and systematic errors for destructive and non-destructive assay measurements ²² performed on nuclear material.	SQP		
IAEA inspectors are provided with all necessary records and supporting documentation, in the agreed form and language, in accordance with the relevant Facility/LOF Attachment, in a timely manner.	States with CSA and no SQP, or with Mod. SQP	52, 54, 60	
Records contain accurate and complete information about physical inventory, inventory changes, measurement results, measurement uncertainties, and all adjustments and corrections made regarding the above information together with all relevant supporting documentation to aid in evaluation of the records.	States with CSA and no SQP	54, 56, 57 SA 2-2.1	
<i>Infrastructure for Provision of Information to the IAEA</i>			
All required information is submitted, and the necessary support is provided, to the IAEA to facilitate the effective and efficient implementation of safeguards activities.	All States with CSAs	7	
For a State with Subsidiary Arrangements, information is provided to the IAEA on the State's safeguards regulatory authority and the regulatory requirements established in the State to implement its safeguards obligations.	All States with CSAs and SAs	SA 2.2	
<i>Infrastructure for Facilitating IAEA Activities in the State</i>			
The necessary legal, regulatory and procedural measures are established to facilitate complementary access, announced and unannounced inspections, and inspectors are provided with the necessary information, granted access to locations, and provided with needed support from the State in order to carry out all necessary safeguards activities without delay	All States with CSAs	9, 84, 88, 89	4, 5, 9
All relevant nuclear material, instruments and standards are made available to inspectors for verification in a timely manner, and IAEA inspectors are able to observe sample taking, verify that samples are representative, observe instrument calibration and ship samples for analysis in a timely and secure manner.	All States with CSAs	9	
The IAEA is provided with the relevant technical support to carry out activities as necessary, such as installing, repairing and maintaining equipment for independent measurement and containment and surveillance.	States with CSA and no SQP, or with Mod. SQP	88	
4. Provision of Initial Information on Nuclear Material			
A correct and complete initial report is submitted on time, in the agreed format, and includes all nuclear material subject to safeguards. As necessary, corrections or amendments to the	All States with CSA and no SQP, or with	34(c), 33, 62	

²¹ International Target Values 2010 for Measurement Uncertainties in Safeguarding Nuclear Materials (IAEA STR-368, November 2010)

²² For detailed information regarding measurements of nuclear material, see the Nuclear Material Accounting Handbook, section 5.2, pages 41-45.

Outcomes of Implementing the Required Activities	Applies to	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540
initial report are submitted to the IAEA.	Mod SQP		
Correct and complete information is provided to the IAEA on time on holdings of pre-34(c) material as provided in Article 2.a.(vi) of INFCIRC/540.	AP		2.a. (vi), 3
Correct and complete information is provided to the IAEA on time, on all nuclear material exempted from safeguards based on quantity, and on nuclear material exempted from safeguards based on use, which exceeds the thresholds defined in paragraph 37 of INFCIRC/153 and which is not yet in a non-nuclear end use form.	AP		2.a. (vii) a, b; 3
5. Provision of Information on Locations in the State			
<i>Initial and Updated Information on Facilities</i>			
Detailed design information is provided on time to the IAEA for each existing facility, using the agreed format, within 60 days of entry into force of the safeguards agreement.	States with CSA and no SQP	42, 43, 44	
The IAEA is notified and preliminary design information is provided about a planned facility as soon as the decision to construct or authorize construction has been taken (whichever is earlier).	All States with CSAs	42, Mod SQP text	
A Design Information Questionnaire (DIQ) based on preliminary design and construction plans is provided to the IAEA at least 180 days before construction begins. A complete DIQ based on as-built designs is provided to the IAEA at least 180 days before nuclear material is received at a new facility.	States with CSA and no SQP	43	
Information on changes to facility design of operations is provided to the IAEA well in advance of making the change, affording sufficient time for analysis and evaluation, to ensure the effectiveness of the safeguards system at the facility is maintained.	States with CSA and no SQP	45 SA 3.1	
<i>Initial and Updated Information on LOFs</i>			
Complete, correct and timely information on all locations outside facilities (LOFs) in the State is provided to the IAEA upon entry into force of the CSA.	States with CSA and no SQP, or with Mod SQP	49	
Information about a new LOF is provided to the IAEA as early as possible and not later than 180 days before nuclear material is introduced to the LOF.	All States with CSAs	SA 3.1	
Information about LOFs is updated to reflect changes and provided to the IAEA not later than 30 days after the change has occurred.	All States with CSAs	49	
<i>Information on Facilities and LOFs Specified in Subsidiary Arrangements</i>			
As required based on the Subsidiary Arrangements, information is provided to the IAEA for each facility or LOF, on the following topics: organizational responsibility for material accountancy and control; facility-specific health and safety procedures; laws and regulations relevant to inspectors and	States with CSA and no SQP	44 SA 3.2	

Outcomes of Implementing the Required Activities	Applies to	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540
their radiological protection; and locations where medical services can be provided to inspectors in case of an accident involving radiation.			
As required based on the Subsidiary Arrangements, the State provides the IAEA with reports of radiation doses received by inspectors in the performance of their functions in the State, quarterly, and as soon as possible after any significant radiation exposure.	States with CSA and no SQP	SA 3.2	
<i>Initial and Updated Information on Sites</i>			
Complete and accurate descriptions of all sites are provided to the IAEA, including detailed maps of the sites and descriptions of activities conducted in listed buildings, within 180 days of entry into force of an AP.	AP		2.a. (iii); 3
The IAEA receives updated information at least annually (by 15 May) to reflect changes in the structure and use of each site, including an updated map of the site and updated information about activities in buildings on the site, as well as complete and accurate information about all new sites.	AP		2.a. (iii); 3
6. Initial and Updated State Declarations of Nuclear Fuel Cycle-Related Activities			
Complete, timely and correct information is provided to the IAEA regarding the State's nuclear fuel-cycle related research and development activities not involving nuclear material, the scale of operations for each location engaged in activities specified in Annex 1 of INFCIRC/540, and nuclear development plans, at a level of detail useful for evaluation of coherence and internal consistency, and consistency with all other information obtained by the IAEA.	AP		2.a.(i), (iv), (x) 2.b.(i), 3
Complete, timely and correct information is provided to the IAEA regarding all uranium mines, and uranium and thorium concentration plants, and their status.	AP		2.a.(v), 3
Complete, timely and correct information is provided to the IAEA on all exports of items listed in Annex II to the INFCIRC/540, on a quarterly basis. Within 60 days of receiving a request from the IAEA, information regarding imports of Annex II items is provided to the IAEA.	AP		2.a.(ix), 3
Complete and correct updates to declarations on the relevant R&D activities [2.a.(i), 2.b.(i)], manufacturing activities [2.a.(iv)], uranium mining and uranium and thorium concentration plants [2.a.(v)] and plans for nuclear development [2.a.(x)] are submitted by 15 May each year for the period covering the previous calendar year, enabling the IAEA's evaluation of the continued coherence, internal consistency and consistency with other information available to the IAEA.	AP		2.a.(i), (iv), (v), (x), 3.b.
The IAEA receives a complete declaration from the State including each relevant article, with "nothing to declare" indicated as appropriate.	AP		3
7. Provision of Updates to Information on Nuclear Material			

Outcomes of Implementing the Required Activities	Applies to	Refers to Paras in INFCIRC/ 153 and SA	Refers to Articles in INFCIRC/ 540
<i>Updates to Information on Nuclear Material</i>			
Correct, timely and complete information is provided to the IAEA on physical inventories and inventory changes for each MBA. The information is based on records and operational data and is in sufficient detail to enable the IAEA to conclusively evaluate each material balance in an efficient manner.	States with CSA and no SQP	63, 64, 65 SA Code 10	
A correct and complete material balance report for every MBA in the State is submitted to the IAEA within 30 days after the physical inventory in that MBA has been taken, together with a complete and accurate physical inventory listing for that MBA.	States with CSA and no SQP	63, 67 SA 3.4.2	
<i>Termination of Safeguards</i>			
Nuclear material on which the Agency has approved termination of safeguards, is properly accounted for and reported on time by the State to the IAEA, as an inventory change.	States with CSA and no SQP, or with Mod SQP	11, 13, 35	
Correct and complete information is provided on time to the IAEA regarding the location or further processing of intermediate or high-level waste containing plutonium, high enriched uranium or ²³³ U on which safeguards have been terminated.	AP		2.a. (viii), 3
<i>Exemption from Safeguards</i>			
Nuclear material on which the Agency has approved exemption from safeguards, is properly accounted for and reported on time by the State to the IAEA, as an inventory change.	States with CSA and no SQP, or with Mod SQP	36, 37	
Advance notification of planned processing of nuclear material exempted from safeguards, or its co-location with safeguarded material, is provided to the IAEA in sufficient time such that effective safeguards can be re-applied.	States with CSA and no SQP, or with Mod SQP	38	
Correct and complete updated information is provided to the IAEA regarding exempted material that meets the conditions of INFCIRC/540 Article 2.a.(vii), by 15 May of each year, for the period covering the previous calendar year.	AP		2.a. (vii), 3
<i>Imports and Exports of Pre-34(c) Material</i>			
Correct, complete and timely information is provided to the IAEA regarding imports and exports of pre-34(c) material for nuclear-purpose.	All States with CSAs	34(a) and (b)	
Correct and complete declarations are provided on time to the IAEA regarding imports and exports of pre-34(c) material for non-nuclear purpose, which meet the conditions set out in INFCIRC/540 Article 2.a.(vi) b. and c., by 15 May of each year, for the period covering the previous calendar year.	AP		2.a. (vi) b and c, 3
<i>International Transfers</i>			
The criteria and process for assumption of responsibility for nuclear material received, or transfer of responsibility for nuclear material shipped, are defined in the State's legal and regulatory requirements.	All States with CSAs	12, 91	

Outcomes of Implementing the Required Activities	Applies to	Refers to Paras in INFCIRC/153 and SA	Refers to Articles in INFCIRC/540
Complete and correct notifications are provided to the IAEA for planned exports of nuclear material which meet the conditions specified in paragraph 95 of INFCIRC/153, within the required time frame.	States with CSA and no SQP	92, 93, 94 SA 3.6	
Notifications on imports of pre-34(c) and 34(c) nuclear material are provided well in advance of the planned import, and include all required information regarding the import.	States with CSA and no SQP, or with Mod SQP	95, 96 SA 3.6	
When requested, the State facilitates the IAEA's verification and application of seals on shipments and the verification of quantity and composition of nuclear material received.	States with CSA and no SQP	93	
Any significant delay or suspicion of loss of nuclear material during international transfer is reported to the IAEA immediately in a special report.	States with CSA and no SQP	97	
<i>Non-Application of Safeguards</i>			
When safeguards are not applied on nuclear material for a planned non-peaceful, non-prohibited use, the State provides assurance that no "peaceful use" obligations undertaken by the State will be broken during such use, and arrangements are developed and implemented by the State and the IAEA to ensure that objectives of the Agreement are met.	All States with CSAs	14	
8. Provision of Special Reports, Amplifications and Clarifications			
Any significant delay or any suspicion of loss of nuclear material is reported to the IAEA immediately in a special report, and no later than 72 hours after the event occurred.	All States with CSAs	68, 97 SA 3.5.1, 3.5.3	
Amplifications or clarifications of any report or declaration can be provided to the IAEA by the State within 30 days of the Agency's request.	All States with CSAs AP	69 SA 3.4.3	2.c.
9. Provision of Access to the IAEA			
<i>Verification of Facility Design and Status</i>			
Timely and adequate access is provided to IAEA inspectors to examine and verify design information, and to re-verify design information to assure its continued accuracy and validity.	States with CSA and no SQP	48	
Timely and adequate access is provided to IAEA inspectors to confirm the continued decommissioned status of facilities.	AP		4.a.
<i>Inspections</i>			
Prompt access is provided to the IAEA to all facilities and LOFs.	States with CSA and no SQP, or with Mod SQP	76, 89	
Prompt access is provided to the IAEA to locations to carry out inspection activities.	States with CSA and no SQP, or with Mod SQP	71 – 77, 89	
Correct, complete and up-to-date reports, records and supporting documentation are provided to IAEA inspectors in a	States with CSA and no	71-77, 89	

Outcomes of Implementing the Required Activities	Applies to	Refers to Paras in INFCIRC/ 153 and SA	Refers to Articles in INFCIRC/ 540
timely manner for examination, and inspectors receive timely access to carry out verification activities to achieve their inspection objectives.	SQP, or with Mod SQP		
Procedures are established and implemented in the State to permit IAEA inspectors unannounced access to facilities as required.	States with CSA and no SQP	84	
Procedures are established and implemented in the State to enable and facilitate IAEA inspectors' access as necessary to verify information contained in special reports.	States with CSA and no SQP, or with Mod SQP	77, 89	
Complementary Access			
IAEA inspectors are granted access without delay to carry out complementary access, and are able to carry out activities to meet the objective of the access, unimpeded by the accompaniment of the SRA or the use of managed access.	AP		4, 5
Access is provided to any location requested by the IAEA for the collection of location-specific environmental samples.	AP		5
All requested records, reports and other information is provided to the IAEA in a timely manner, in order to meet the objectives of the access.	AP		6
The IAEA is informed about places where managed access may be applicable before complementary access is performed at those locations.	AP		7
10. IAEA Rights and Obligations			
Information used by the IAEA in drawing safeguards conclusions is independently attained and/or validated.	IAEA	7	
The IAEA establishes and implements policies and procedures to protect States' confidential information and takes precautions to ensure that such information is not revealed through IAEA communications and publications, except that specific information related to safeguards implementation is given to the Board of Governors and IAEA staff members as required.	IAEA	9	15, 14, 6
Safeguards implementation is conducted in a manner designed to avoid hampering international commerce or restricting growth and development in peaceful uses of nuclear material.	IAEA	9, 87	
IAEA inspectors adhere to operational, safety and radiation protection rules established at each facility, do not take part in facility operations, and do not direct facility staff. Facility operators and the SRA are responsible for facilitating inspections and for inspector safety.	IAEA	87	
The State's capabilities and other factors are taken into consideration in designing the State-specific safeguards approach to meet objectives in an efficient manner.	IAEA	81	
The safeguards approach, material balance areas, strategic points and safeguards measures for a facility are determined based on the examination and verification of design information, and information regarding the requirements and procedures for physical inventory taking.	IAEA	46, 47, 50, 29	

Outcomes of Implementing the Required Activities	Applies to	Refers to Paras in INFCIRC/ 153 and SA	Refers to Articles in INFCIRC/ 540
Safeguards approaches continually evolve to apply modern technological advancements and practices to optimize effectiveness and efficiency, and take account of experiences gained in the implementation of safeguards.	IAEA	6	
Inspection activities are determined taking into account all information known about a State, the State's notifications, the facility's operational programme, nuclear material characteristics and facility features.	IAEA	8, 70, 78, 82	
The IAEA's programme of inspections is periodically communicated to the State.	IAEA	5	
The inspection effort is based on a comprehensive evaluation of all information, taking into account factors such as the quantity and form of nuclear material, and the IAEA's ability to meet its objectives.	IAEA	79, 80, 81, 84	
All information known about a State is evaluated to determine when and where complementary access is performed.	IAEA		4
Each State is afforded an opportunity to resolve questions or inconsistencies concerning its declarations.	IAEA		4
States are provided with timely advance notification of complementary access as required, and the opportunity to use managed access.	IAEA		4
Complementary access is conducted during normal working hours unless previously agreed with the State.	IAEA		4
Each State is kept informed in a timely manner on the results and findings of inspections and the activities carried out under its AP and corresponding results.	IAEA	10, 30, 90	10
Each year, the IAEA provides information to the Board of Governors regarding the implementation of IAEA safeguards.	IAEA	5	
Each State is kept informed in a timely manner of the book inventory maintained by the IAEA for that State.	IAEA	12, 41, 66, SA 4.1.3	
The IAEA's intention to verify international transfers is announced to the respective State.	IAEA	SA 4.2.2	
Each States is notified regarding unmatched transfers of nuclear material exported from that State.	IAEA	12, SA 4.1.1	
11. Responsibilities Shared By the State and the IAEA			
Points of contact have been designated by the State, who have authority and responsibility to communicate with the IAEA on all safeguards matters.	All States with CSAs	7, SA 1	
The IAEA directs communications to the State in accordance with the agreed procedures, and to the appropriate points of contact.	IAEA	7, SA 1	
As necessary, the State's points of contact communicate with other institutions within the State to address IAEA requests which require coordination (e.g., inspector designations, visa issuance, data collection).	All States with CSAs	7, SA 1	
IAEA inspectors and their equipment and systems are able to transmit information out of the State as necessary to implement	AP		14.a.

Outcomes of Implementing the Required Activities	Applies to	Refers to Paras in INFCIRC/ 153 and SA	Refers to Articles in INFCIRC/ 540
safeguards.			
The IAEA establishes a programme for information security, and its procedures are documented, audited and subject to review by the Board of Governors.	AP		15
When so requested, sensitive design information is reviewed by the IAEA on the premises of the State.	States with CSA and no SQP	8	
Summary information regarding materials and facilities subject to safeguards in States is reported to the Board of Governors, as necessary, to keep it informed of Agency activities and findings.	IAEA		
Agency staff to be used as inspectors are designated by the Director General and approved by the Board of Governors.	IAEA, BOG	85	
Each State is afforded the opportunity to reject specific inspectors designated to conduct inspections in that State. States whose continued rejection of inspectors impedes safeguards implementation are reported to the Board of Governors.	All States with CSAs	9, 85	11
Designated inspectors are provided one-year or longer, multiple entry/exit visas, by each State in a timely manner.	All States with CSAs	86, SA Code 9	12
The State and the IAEA each provides for its own expenses incurred in the implementation of safeguards, and the IAEA reimburses the State for the costs of services, as agreed in advance by the IAEA.	All States with CSAs, IAEA	15	
IAEA staff are provided all necessary privileges and immunities in accordance with the provisions of the agreement.	All States with CSAs	10, 16, 17	
Questions of interpretation or application of a CSA that cannot be resolved directly between the IAEA and the State are resolved through discussions of the Board of Governors.	All States with CSAs, IAEA, BOG	20, 21, 22, 27	
States and the IAEA make arrangements to enable safeguards objectives to be met, in case unusual circumstances require limitations of access.	All States with CSAs, IAEA	76	
The text of all CSAs and amendments thereto are made available to all Member States.	IAEA	5	
CSAs, APs and Subsidiary Arrangements are brought into force upon notification to the IAEA by the State, or as provided therein.	All States with CSAs	25, 39, 40	17
Amendments to CSAs, APs, and Subsidiary Arrangements are approved by both the State and the IAEA before entering into force.	All States with CSAs, IAEA	23, SA Preamble	

CONTRIBUTORS TO DRAFTING AND REVIEW

Agboraw, E.	International Atomic Energy Agency
Albqoor, M.	Nuclear Regulatory Commission of Jordan
Belemsaga, D.	Agency for Radiation Safety of Burkina Faso
Baudinet, D.	International Atomic Energy Agency
Cisar, V.	International Atomic Energy Agency
Cooley, J.	International Atomic Energy Agency
Crete, J. M.	International Atomic Energy Agency
Dackner, J.	EURATOM Safeguards Directorate
Dias, F.	Nuclear Energy Commission of Brazil
Doulgeris, N.	International Atomic Energy Agency
Garcia Carrera, A.	International Atomic Energy Agency
Grzelke, B.	International Atomic Energy Agency
Gyane, E.	International Atomic Energy Agency
Hatt, D.	International Atomic Energy Agency
Iso, S.	Nuclear Material Control Centre of Japan
Kovacic, D.	International Atomic Energy Agency
Lamari, M.	International Atomic Energy Agency
Larsson, M.	Radiation Safety Authority of Sweden
Lee, N. Y.	Korean Institute of Nuclear Non-proliferation and Control
Lieskovsky, M.	International Atomic Energy Agency
Mathews, C.	International Atomic Energy Agency
Maunula, K.	International Atomic Energy Agency
Maxwell, R.	Canadian Nuclear Safety Commission
Moran, B.	International Atomic Energy Agency
Mukhametshina, N.	International Atomic Energy Agency
Munoz, S.	International Atomic Energy Agency
Nguyen, H. V.	Vietnam Agency for Radiation and Nuclear Safety
Petoe, A.	International Atomic Energy Agency
Rasweswe, M.	Nuclear Energy Corporation of South Africa
Rilakovic, H.	International Atomic Energy Agency
Rockwood, L.	International Atomic Energy Agency
Solichah, M.	Nuclear Energy Regulatory Agency of Indonesia
Stastny, O.	State Office for Nuclear Safety of Czech Republic
Stepanek, T.	International Atomic Energy Agency
Stevens, R.	International Atomic Energy Agency

Sunshine, A.	National Nuclear Security Administration of the United States
Suseanu, I.	International Atomic Energy Agency
Szollosi, E.	Hungarian Atomic Energy Authority
Touil, Y.	International Atomic Energy Agency
Vasmant, A.	International Atomic Energy Agency
Zarucki, R.	International Atomic Energy Agency



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GERMANY

Goethe Buchhandlung Teubig GmbH

Schweitzer Fachinformationen
Willstätterstrasse 15, 40549 Düsseldorf, GERMANY
Telephone: +49 (0) 211 49 874 015 • Fax: +49 (0) 211 49 874 28
Email: kundenbetreuung.goethe@schweitzer-online.de • Web site: <http://www.goethebuch.de>

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Telephone: +39 02 48 95 45 52 • Fax: +39 02 48 95 45 48
Email: info@libreriaaeiou.eu • Web site: <http://www.libreriaaeiou.eu>

JAPAN**Maruzen-Yushodo Co., Ltd.**

10-10, Yotsuyasakamachi, Shinjuku-ku, Tokyo 160-0002, JAPAN
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RUSSIAN FEDERATION**Scientific and Engineering Centre for Nuclear and Radiation Safety**

107140, Moscow, Malaya Krasnoselskaya st. 2/8, bld. 5, RUSSIAN FEDERATION
Telephone: +7 499 264 00 03 • Fax: +7 499 264 28 59
Email: secnrs@secnrs.ru • Web site: <http://www.secnrs.ru>

UNITED STATES OF AMERICA**Bernan Associates**

4501 Forbes Blvd., Suite 200, Lanham, MD 20706-4391, USA
Telephone: +1 800 865 3457 • Fax: +1 800 865 3450
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