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Webinar on the Technical Implementation of the Convention on the Physical Protection of Nuclear Material (CPPNM) and Its Amendment supported by the IAEA Nuclear Security Series

Housekeeping Items

- Host & Moderator
  - Austin Hammer – Assoc. Nuclear Security Officer, Nuclear Material Security Unit, Nuclear Security of Materials and Facilities Section, Division of Nuclear Security, IAEA

- Listen through your computer
  - To test your speakers, select the “Audio and Video” tab at the top of the page, and select “Speaker and Microphone Settings…”
- To Ask Questions
  - Select the “Q&A” pane within the chat and type in your question
- Share with others or watch it again
  - A video/audio recording of the webinar and the slides will be made available at https://www.iaea.org/ns-webinars/nuclear-security

Housekeeping Items Cont.

- There will be a one-question survey at the end of this webinar
  - https://www.menti.com/
  - Code: **4097 7400**
- 10 Speakers
  - 9 Thematic Areas Covered
- Break scheduled after 6 speakers
  - 10-Minutes

Objectives

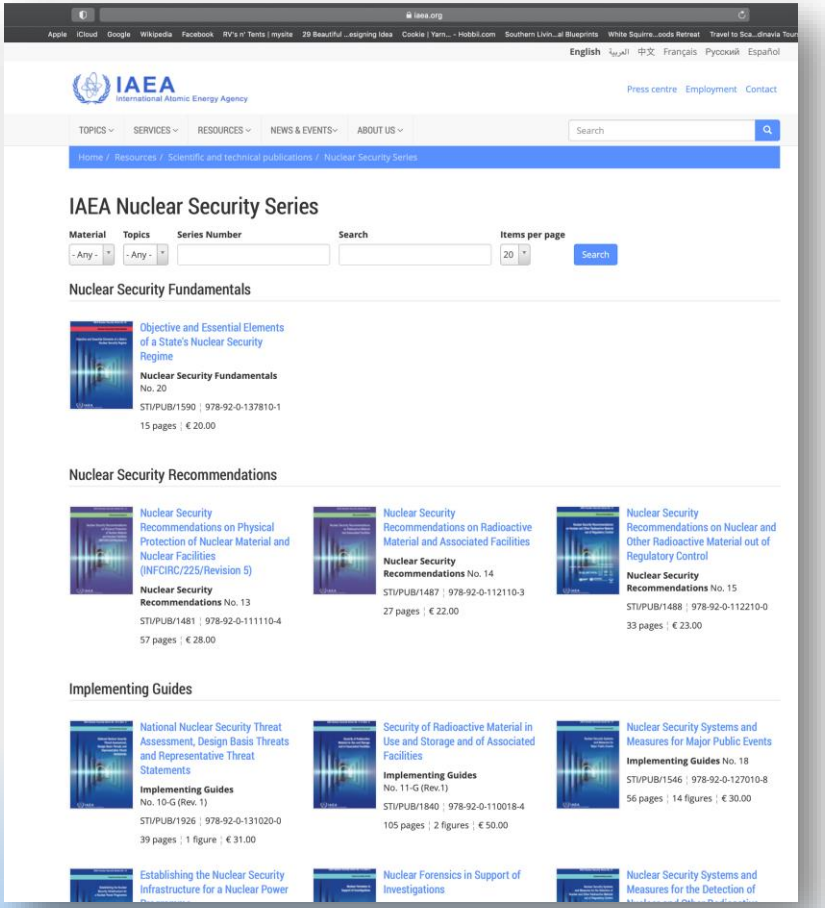
The objectives of the webinar are:

- To present an introduction and broad overview of the Nuclear Security Series (NSS) publications that relate to the technical implementation of the CPPNM and its Amendment
- To inform participants of the available resources provided by the IAEA for the implementation of the CPPNM and its Amendment
- To allow participants to express which thematic areas they would like a more in-depth presentation on

Objectives Cont.

- To find any of the Nuclear Security Series Documents, go to:

https://www.iaea.org/resources/security-series/search



Opening Remarks

Ms. Elena Buglova

Director, Department of Nuclear Safety and Security, Division of Nuclear Security, IAEA

Mr. Muhammad Khaliq

Section Head of Nuclear Security of Materials and Facilities Section,
Division of Nuclear Security, IAEA

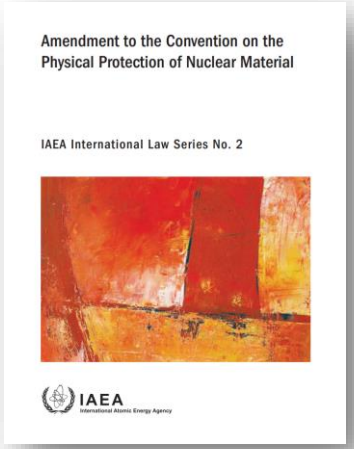
Convention on the Physical Protection of Nuclear Material (CPPNM) and the Amendment

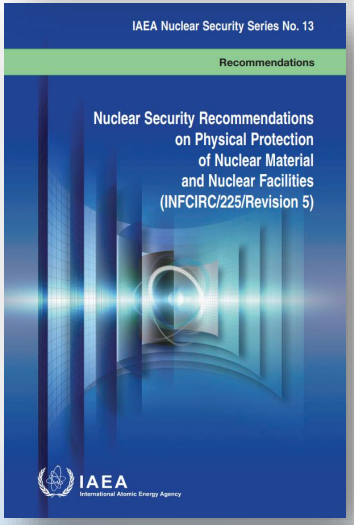
	Physical Protection	Offences	International Cooperation
CPPNM	**Nuclear material** in **international** transport	**Unauthorised use** of, or **threat to use**, nuclear material, to cause death, personal injury or property damage **Theft** of nuclear material **Ancillary Offences** (attempt to commit a listed offence and participation therein)	**Cooperation and assistance** in connection with **criminal proceedings** and **physical protection systems**, **Information exchange** to protect or recover unlawfully taken material
	In addition	**In addition**	**In addition**
AMENDMENT	**Nuclear facilities**, and **nuclear material** in **domestic** use, storage and transport **Physical protection regime** (legislative and regulatory framework, competent authority, etc.)	**Smuggling** of nuclear material **Sabotage** of nuclear facilities Coverage of "**substantial damage to the environment**" New **ancillary offences** (organisation or direction of others to commit a listed offence)	**Expanded cooperation**, assistance and **information exchange** to locate and recover stolen material and in case of sabotage

Connection between INFCIRC 225/Rev. 5 with CPPNM and ACPPNM

- There is a strong connection between INFCIRC 225/Rev. 5 and the CPPNM and ACPPNM. Historically they follow each other.
- Amended CPPNM "recognizes that there are internationally formulated physical protection recommendations that are updated from time to time which can provide guidance on contemporary means of achieving effective levels of physical protection." **(Preamble)**
- INFCIRC/225/Rev.5 is consistent with Fundamental Principles endorsed by the IAEA BOG (September 2001) and the text of the Amendment to the CPPNM (2005)
- Informally, INFCIRC/225/Rev. 5 is sometimes referred to as the implementing guidance of the technical component of the CPPNM and its Amendment.

12 Fundamental Principles of Physical Protection of Nuclear Material and Nuclear Facilities:





- **FUNDAMENTAL PRINCIPLE A**: Responsibility of the State
- **FUNDAMENTAL PRINCIPLE B**: Responsibilities During International Transport
- **FUNDAMENTAL PRINCIPLE C**: Legislative and Regulatory Framework
- **FUNDAMENTAL PRINCIPLE D**: Competent Authority
- **FUNDAMENTAL PRINCIPLE E**: Responsibility of the License Holders
- **FUNDAMENTAL PRINCIPLE F**: Security Culture
- **FUNDAMENTAL PRINCIPLE G**: Threat
- **FUNDAMENTAL PRINCIPLE H**: Graded Approach
- **FUNDAMENTAL PRINCIPLE I**: Defense in Depth
- **FUNDAMENTAL PRINCIPLE J**: Quality Assurance
- **FUNDAMENTAL PRINCIPLE K**: Contingency Plans
- **FUNDAMENTAL PRINCIPLE L**: Confidentiality

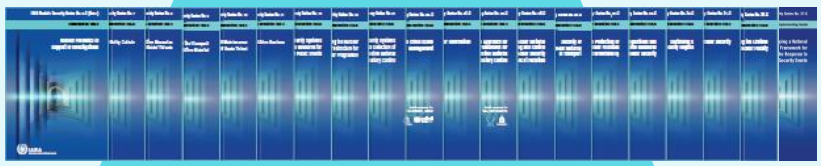
IAEA Nuclear Security Series

Fundamentals (PRINCIPLES)

- Objectives and principles
- Basis for Nuclear Security Recommendations
- Essentials from international instruments

Recommendations (WHAT)

- General approaches, actions, concepts and strategies to achieve and maintain effective nuclear security
- Applications of Fundamentals



Implementing Guides (HOW)

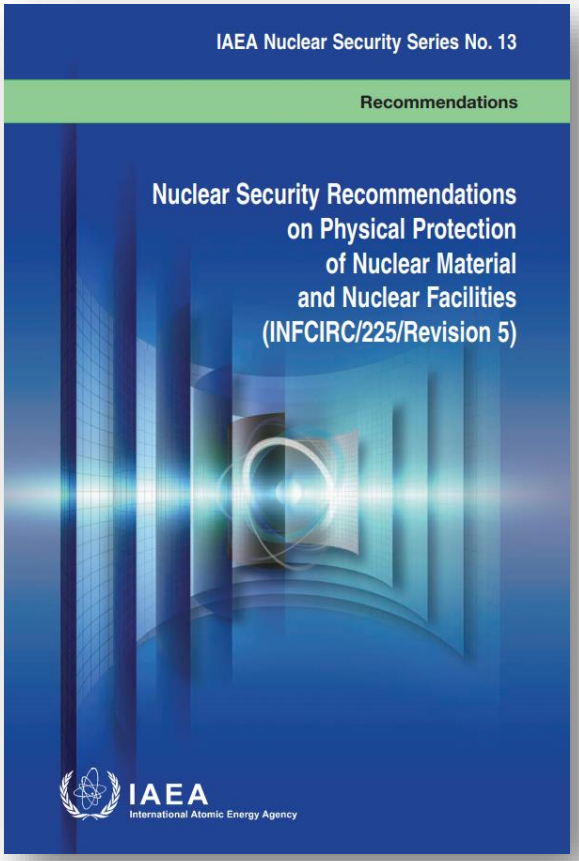
- Broad guidance on the means by which States could meet Recommendations
- Ways and means for how Recommendations implemented at systems level

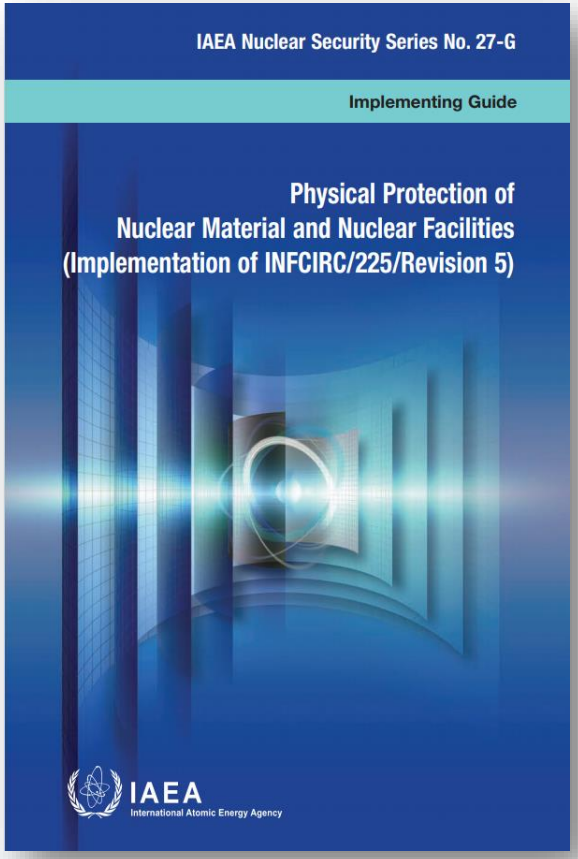
Technical Guidance (DETAILS)

- Guidance on the implementation of specific technical subjects
- Reference Manuals, Training Guides, Service Guides

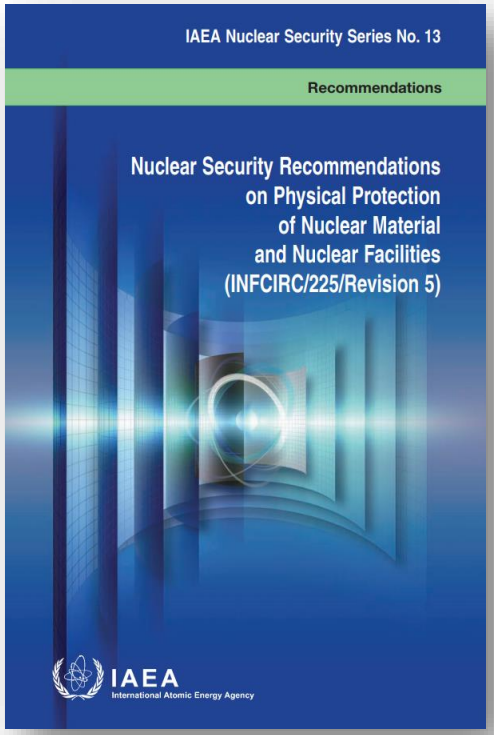
41 (and counting) NSS documents assist in the implementation of obligations contained in international legal instruments relevant to nuclear security

Implementation of: Physical Protection Regime





Recommendations on Physical Protection



- Provides guidance to States and their competent authorities on how to enhance, implement, and maintain a physical protection regime
- Defines how the application of the 12 Fundamental Principles of Physical Protection of Nuclear Material and Nuclear Facilities address the four objectives of a State's physical protection regime:
  - To protect against unauthorized removal
  - To locate and recover missing material
  - To protect against sabotage
  - To mitigate or minimize effects of sabotage
- Subsequent publications within this presentation provide implementing and technical guidance on the implementation of NSS No. 13, as it relates to one or more of the four objectives

Categorization of Nuclear Material

- Additionally, NSS No.13 provides guidance on categorizing nuclear material
- Categorization is inherently related to **Fundamental Principle H**: Graded Approach
- The use of a graded approach is a principle factor in the development and implementation of a physical protection regime
- The table is consistent with CPPNM and its Amendment.

TABLE 1. CATEGORIZATION OF NUCLEAR MATERIAL

Material	Form	Category I	Category II	Category III[c]
1. Plutonium [a]	Unirradiated[b]	2 kg or more	Less than 2 kg but more than 500 g	500 g or less but more than 15 g
2. Uranium-235 (^{235}U)	Unirradiated[b] – Uranium enriched to 20% ^{235}U or more – Uranium enriched to 10% ^{235}U but less than 20% ^{235}U – Uranium enriched above natural, but less than 10% ^{235}U	5 kg or more	Less than 5 kg but more than 1 kg 10 kg or more	1 kg or less but more than 15 g Less than 10kg but more than 1 kg 10 kg or more
3. Uranium-233 (^{233}U)	Unirradiated[b]	2 kg or more	Less than 2 kg but more than 500 g	500 g or less but more than 15 g
4. Irradiated fuel (The categorization of irradiated fuel in the table is based on international *transport* considerations. The State may assign a different category for domestic use, storage and *transport* taking all relevant factors into account.)			Depleted or natural uranium, thorium or low enriched fuel (less than 10% fissile content)[d, e]	

Note: This table is not to be used or interpreted independently of the text of the entire publication.

[a] All plutonium except that with isotopic concentration exceeding 80% in plutonium-238.

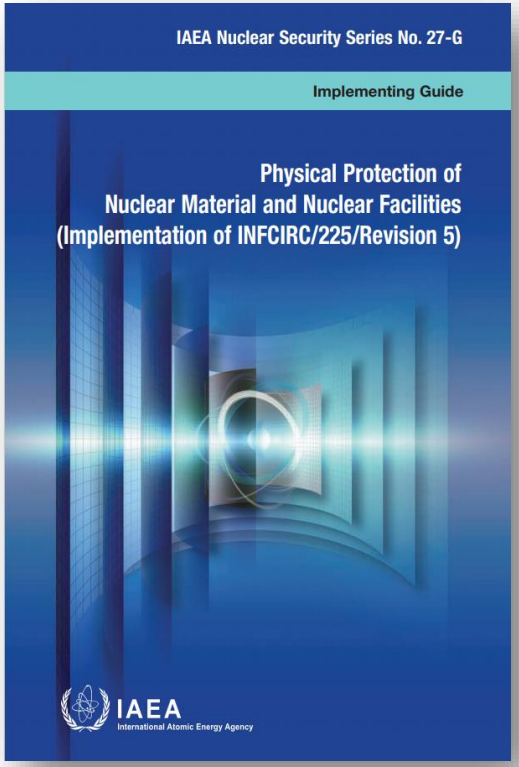
[b] Material not irradiated in a reactor or material irradiated in a reactor but with a radiation level equal to or less than 1 Gy/h. (100 rad/h) at 1 m unshielded.

[c] Quantities not falling in Category III and natural uranium, depleted uranium and thorium should be protected at least in accordance with prudent management practice.

[d] Although this level of protection is recommended, it would be open to States, upon evaluation of the specific circumstances, to assign a different category of physical protection.

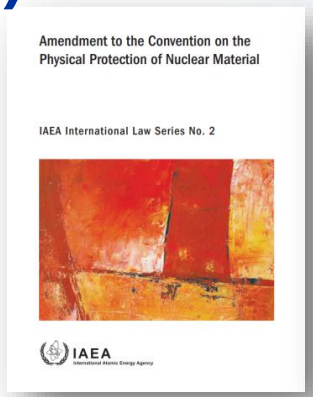
[e] Other fuel which by virtue of its original fissile material content is classified as Category I or II before irradiation may be reduced one category level while the radiation level from the fuel exceeds 1 Gy/h (100 rad/h) at one metre unshielded.

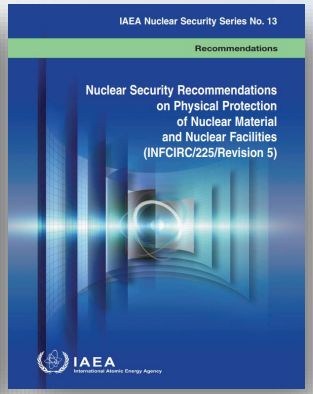
Implementation of Physical Protection Recommendations: Use and Storage

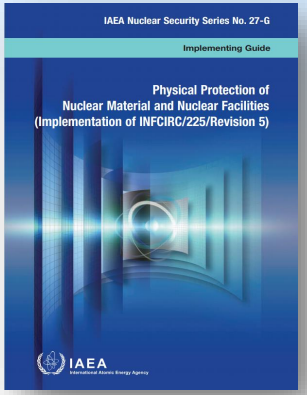


- This publication applies to the physical protection of nuclear facilities and nuclear material in use and storage against:
  1. The unauthorized removal of nuclear material with the intent to construct a nuclear explosive device;
  2. The sabotage of nuclear material and nuclear facilities resulting in radiological consequences.
- It also provides guidance regarding associated measures that may contribute to a coordinated response in the location and recovery of missing nuclear material and the mitigation or minimization of the radiological consequences of sabotage at nuclear facilities.

NSS No. 27-G (1 of 2 Implementing Guides for NSS No. 13)

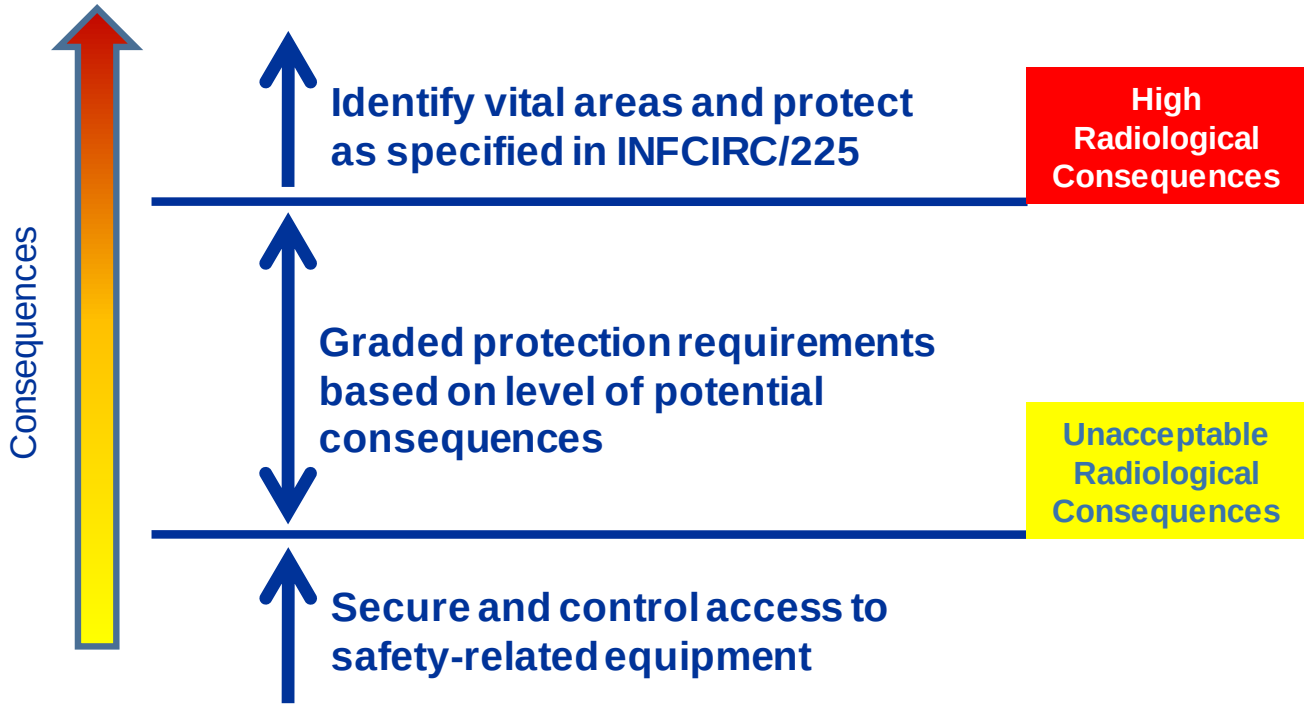




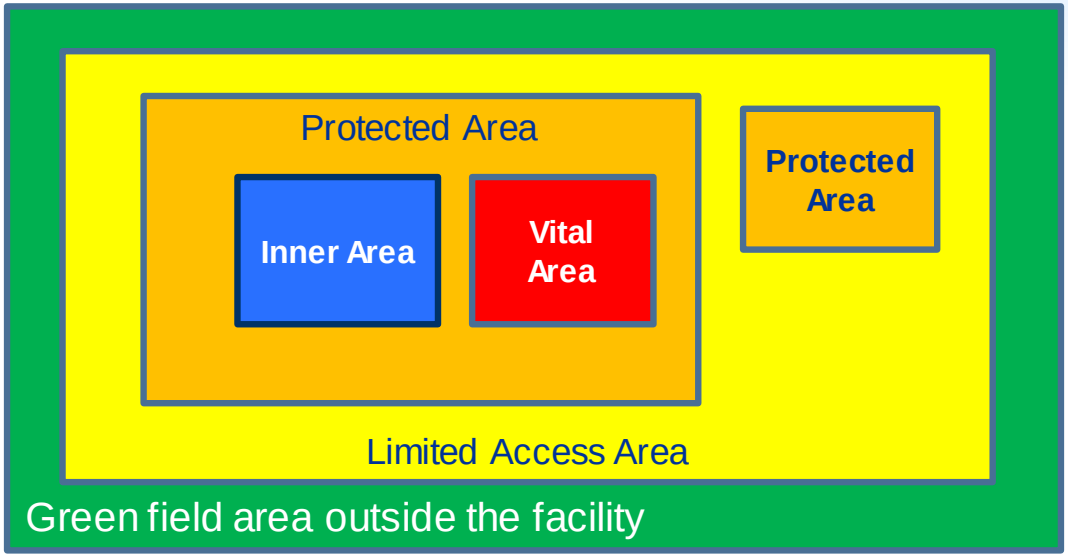


A/CPPNM / INFCIRC 225 Rev. 5 Fundamental Principles	NSS No. 27-G
A: Responsibility of the State	State responsibility (3.5-3.7)
B: Responsibilities During International Transport	
C: Legislative/Regulatory Framework	Legislative and regulatory framework (3.12-3.49)
D: Competent Authority	Assignment of physical protection responsibilities (3.8-3.11)
E: Responsibility of the License Holders	
F: Security Culture	Nuclear security culture (3.105-3.106)
G: Threat	Identification and assessment of threats (3.55-3.63)
H: Graded Approach	4. Developing, implementing and maintaining an integrated physical protection system for nuclear facilities (4.1-4.3)
I: Defence in Depth	
J: Quality Assurance	Quality assurance (3.107-3.110)
K: Contingency Plans	Security plan (4.154-4.161); Appendix II example contingency plan
L: Confidentiality	Security of sensitive information (4.133-4.139)

Graded Approach for Sabotage



Defence In Depth and Graded Approach



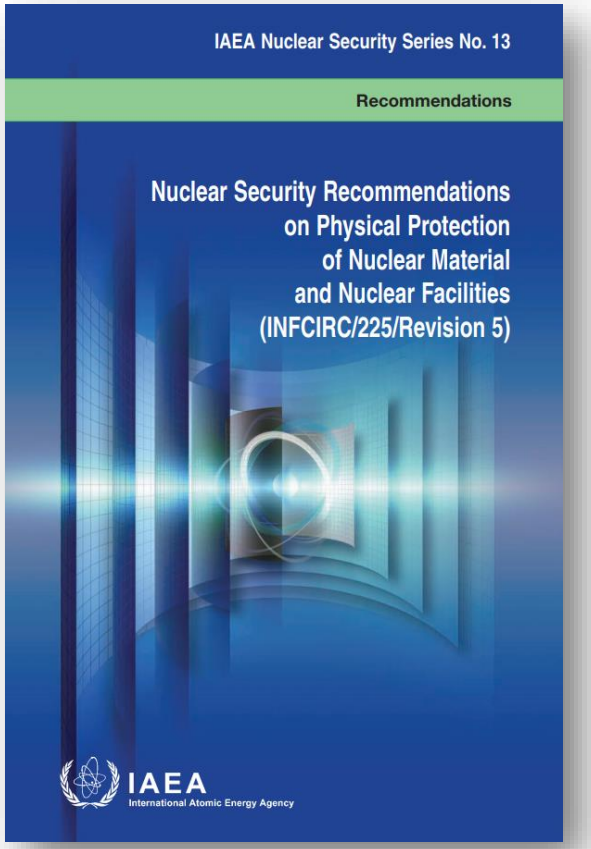
All other areas of nuclear facility, some of which may contain Category III Material, the out blue line of which represents the perimeter of the nuclear facility

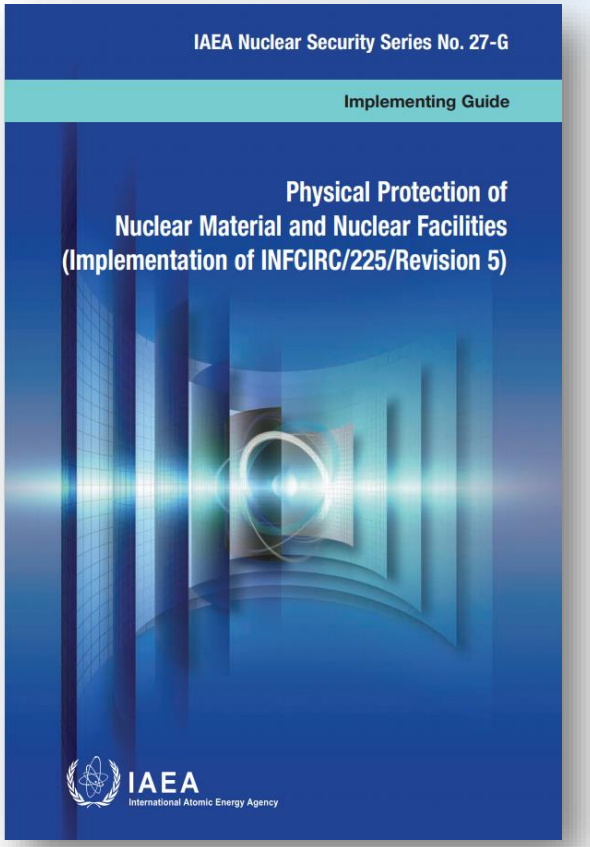
Contains Category I Material

Category II Material, targets between the URC and HRC and inner and/ or Vital Area, the outer blue line of which represents the perimeter of the protected area

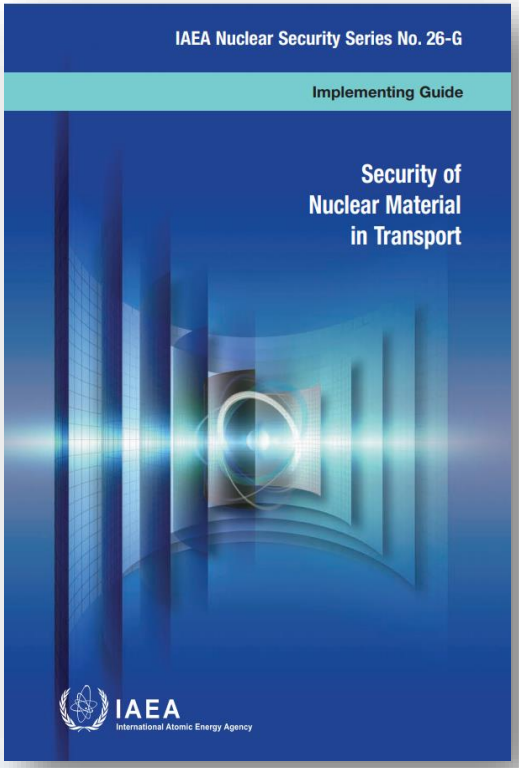
Contains targets, the sabotage of which may lead to HRC

Question and Answer





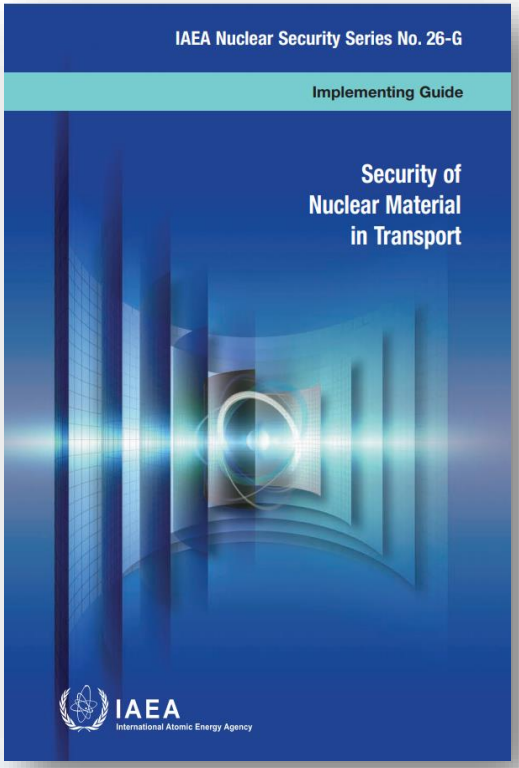
Implementation of: Security of Nuclear Material in Transport



Mr. Thomas Pissulla

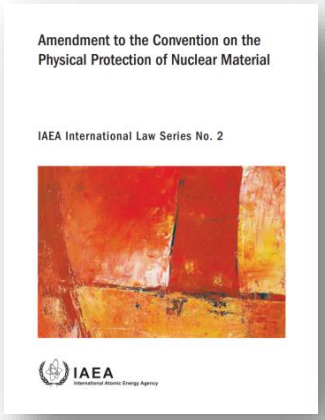
Nuclear Security Officer, Transport Security Unit, Nuclear Security of Materials and Facilities Section, Division of Nuclear Security, IAEA

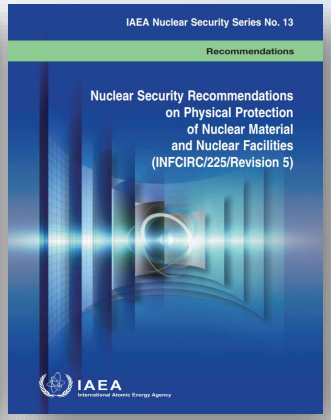
Implementation of Physical Protection Recommendations: Transport

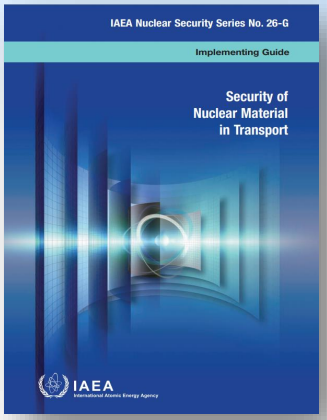


- Guides States and their Competent Authorities on how to implement and maintain a physical protection regime for the transport of nuclear material.
- Useful to shippers or carriers in the design and implementation of their physical protection systems.

NSS No. 26-G (2 of 2 Implementing Guides for NSS No. 13)

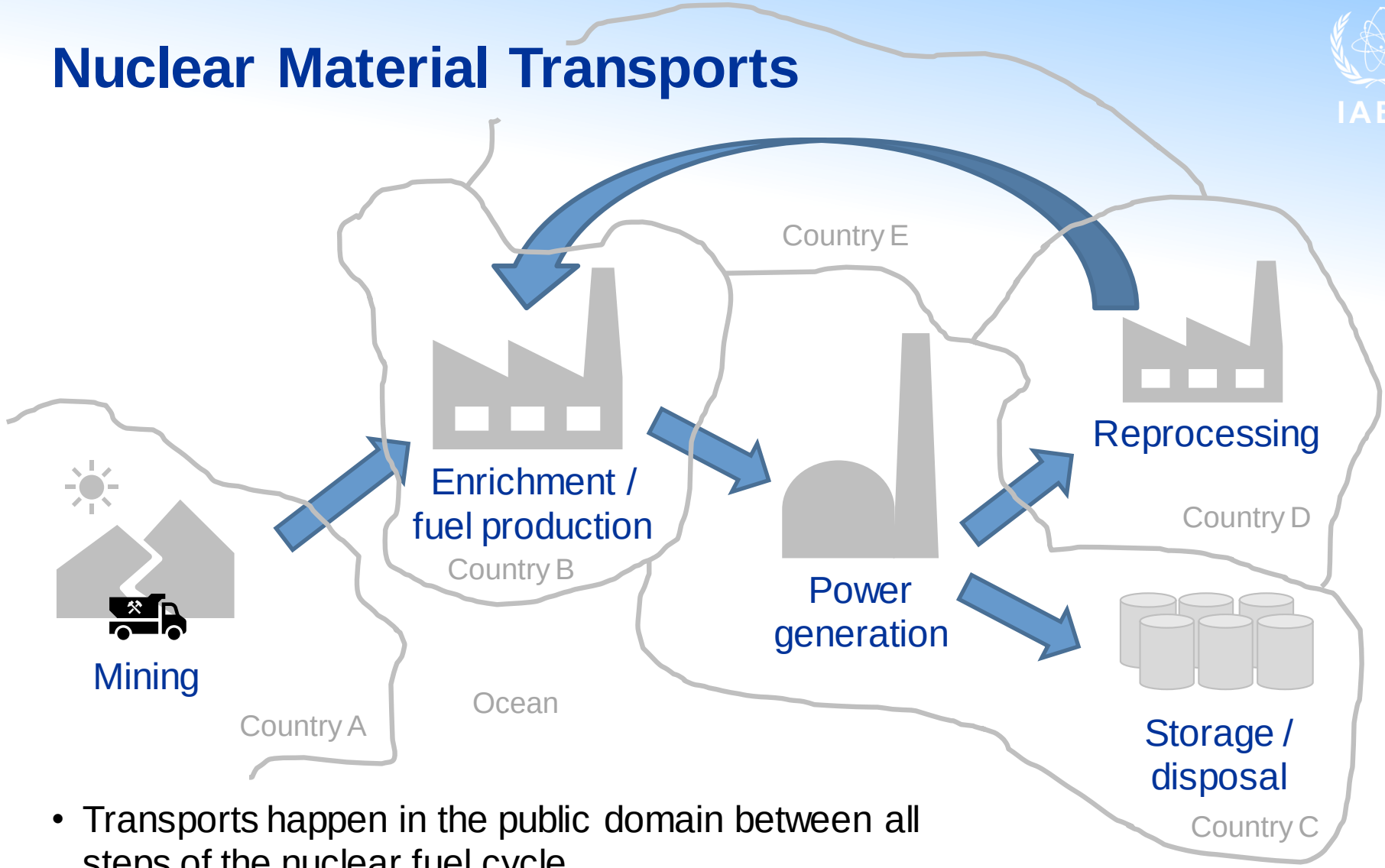






A/CPPNM / INFCIRC 225 Rev. 5 Fundamental Principles	NSS No. 26-G
A: Responsibility of the State	State responsibility (3.2-3.7)
B: Responsibilities During International Transport	International transport (3.8-3.20)
C: Legislative/Regulatory Framework	Legislative and regulatory framework (3.25-3.42)
D: Competent Authority	Legislative and regulatory framework (3.26-3.34)
E: Responsibility of the License Holders	Legislative and regulatory framework (3.34-3.39)
F: Security Culture	Sustaining the physical protection regime (3.57-3.59)
G: Threat	Identification and assessment of threats (3.43-3.56); General approach for designing measures against sabotage during transport (8.2-8.17)
H: Graded Approach	Identification and assessment of threats (3.52-3.55); Nuclear material categorization and aggregation (4.4-4.17)
I: Defence in Depth	Identification and assessment of threats (3.56); Key functions of a physical protection system (5.24-5.30)
J: Quality Assurance	Sustaining the physical protection regime (3.60-3.62)
K: Contingency Plans	Planning and preparedness for and response to nuclear security events (3.70-3.77); Appendix I
L: Confidentiality	Sustaining the physical protection regime (3.63-3.67)

Nuclear Material Transports



- Transports happen in the public domain between all steps of the nuclear fuel cycle…
- …most likely affect different countries…

Nuclear Material Transports


Photo credit: Nuclear Transport Solutions


Photo credit: Nuclear Transport Solutions

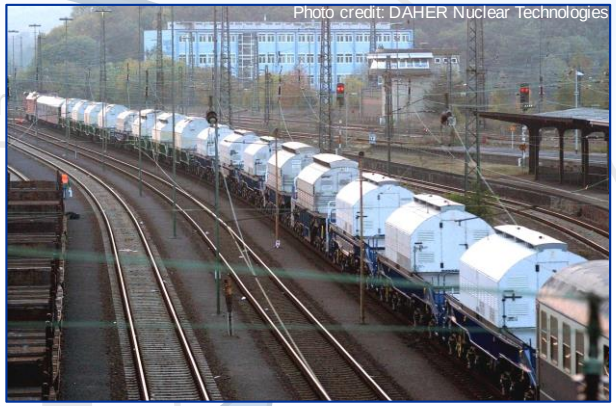


Photo credit: DAHER Nuclear Technologies


Photo credit: DAHER Nuclear Technologies


Photo credit: DAHER Nuclear Technologies


Photo credit: DAHER Nuclear Technologies

- Transports happen in the public domain between all steps of the nuclear fuel cycle…
- …most likely affect different countries…
- …and hence involve several modes of transports

Overview of Content

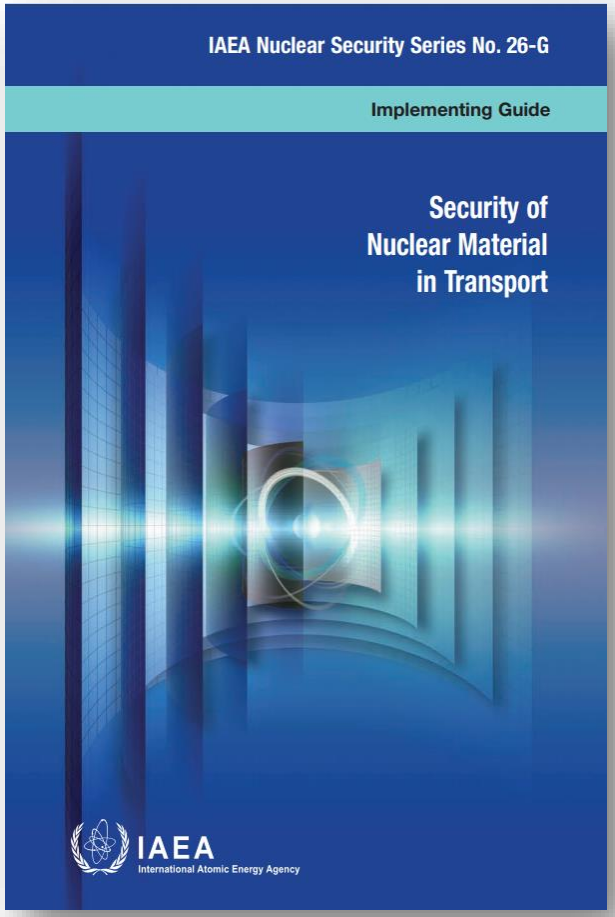
- NSS 26-G discusses the implementation of the Fundamental Principles specific to transport, especially roles and responsibilities of all involved entities
- Provides a basis for transport-specific classification of nuclear material (based on the table in Annex II of the convention) – e.g. for aggregation of different materials in one shipment
- Discusses the development and implementation of a transport security regime, including the roles of shipper, carrier and receiver
- Discusses the development and approval of the transport security plan (TSP)
- Recommends specific security measures for the different categories of NM and for the different modes of transports
- Recommends measures to recover missing or stolen nuclear material (during transport) and measures to mitigate the consequences of sabotage during transport

New Publication on Nuclear Material Transport

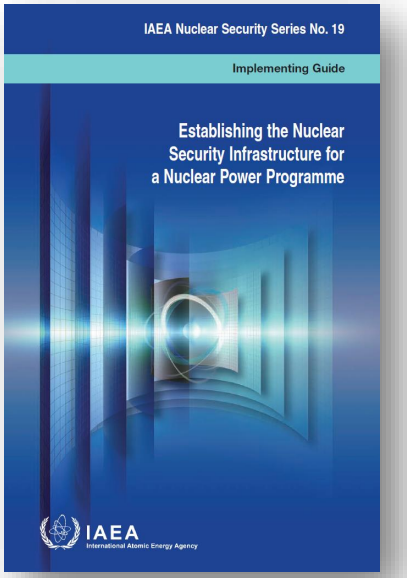
Security of Nuclear and other Radioactive Material in Transport: IAEA Technical Guidance, Nuclear Security Temporary No. 53 (in prep.)

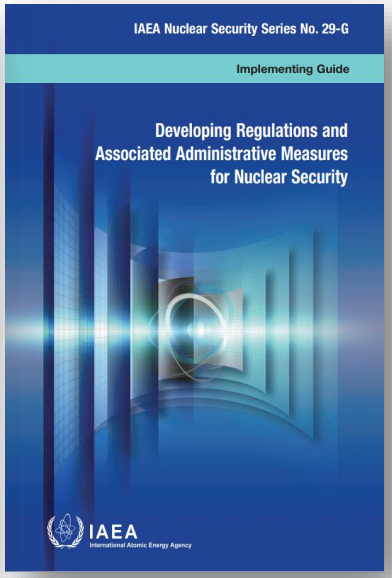
This publication will provide more detailed guidance to States and their competent authorities on how to implement and maintain a nuclear security regime for the transport of nuclear material and other radioactive material.

Question and Answer



Establishment and Implementation of: Nuclear Security Infrastructure and Legislative and Regulatory Framework





Mr. Abdul Shakoor

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Fundamental Principle C and Article 2A of the A/CPPNM

Legislative and Regulatory Framework

The State is responsible to establish and maintain a legislative and regulatory framework; and establish or designate a competent authority responsible for the implementation.

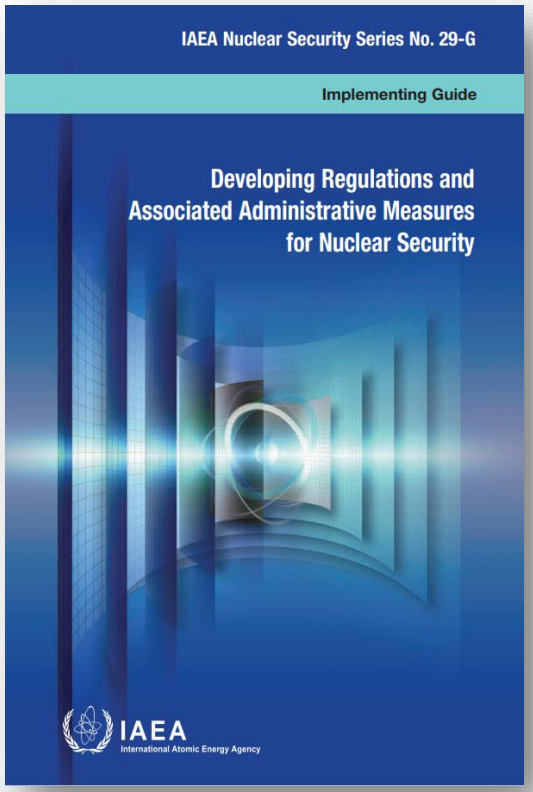
- This framework should provide for the establishment of applicable physical protection requirements and include a system of evaluation and licensing or other procedures to grant authorization.
- Additionally, a system of inspection and the means to enforce applicable requirements and conditions, such as effective sanctions, should be included.

Role of Legislative and Regulatory Framework

The State's nuclear security regime:

- Depends upon responsibilities related to nuclear security being clearly defined and assigned;
- Includes appropriate regulations, agreements and associated administrative measures; and
- Includes provisions for appropriate integration and coordination of responsibilities to ensure the continued appropriateness of these responsibilities.

Developing Regulations and Administrative Measures



This publication provides guidance for States and their competent authorities on measures they should take to develop and maintain a legislative and regulatory framework to govern the nuclear security regime and to put its provisions into effect.

Process of Developing a Legislative and Regulatory Framework

This publication provides guidance on:

- Identification of the responsibilities of those involved in nuclear security so that suitable regulations, agreements and associated administrative measures may be developed;
- Developing suitable regulations, agreements and associated administrative measures;
- Appropriate arrangements for cooperation and coordination among competent authorities.

Scope and Assistance

- This publication addresses the framework for implementing recommendations on:
  - Nuclear material and nuclear facilities,
  - Other radioactive material, associated activities and facilities that are under regulatory control; and
  - Nuclear and other radioactive material that is out of regulatory control.
- This publication includes material to assist States in:
  - Identifying key subject matters;
  - Defining roles and responsibilities;
  - Identifying regulations, agreements and associated administrative measures.

Components of a Legislative and Regulatory Framework

This publication is structured to:

- Provide an overview of the most important aspects to be covered by a State's legislative and regulatory framework for governing nuclear security.
- States may therefore use this publication to undertake a gap analysis of their legislative and regulatory framework for nuclear security in order to take actions to update their framework as necessary.

Components of a Legislative and Regulatory Framework Cont.

- This publication specifically addresses:
  - General regulatory activities for nuclear security;
  - Threat assessment;
  - Security of information;
  - Detection of nuclear and other radioactive material out of regulatory control;
  - Preparedness for and response to nuclear security events;
  - Offences and penalties related to nuclear security, including criminalization.
- Two appendices provide illustrative examples of regulations and agreements

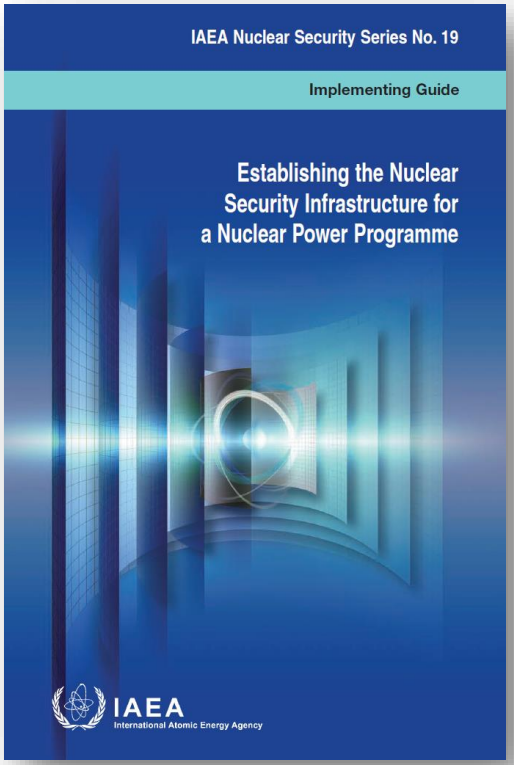
Fundamental Principle A

Responsibility of the State

The responsibility for the establishment, implementation and maintenance of a physical protection regime within a State rests entirely with that State.

- The State's Physical protection Regime includes:
  - The legislative and regulatory framework governing the physical protection;
  - The institutions and organizations responsible for ensuring implementation of the legislative and regulatory framework;
  - Facility and transport physical protection systems.
- The establishment of these mechanisms that constitute the infrastructure of a physical protection regime are the responsibility of the State

Nuclear Security Infrastructure



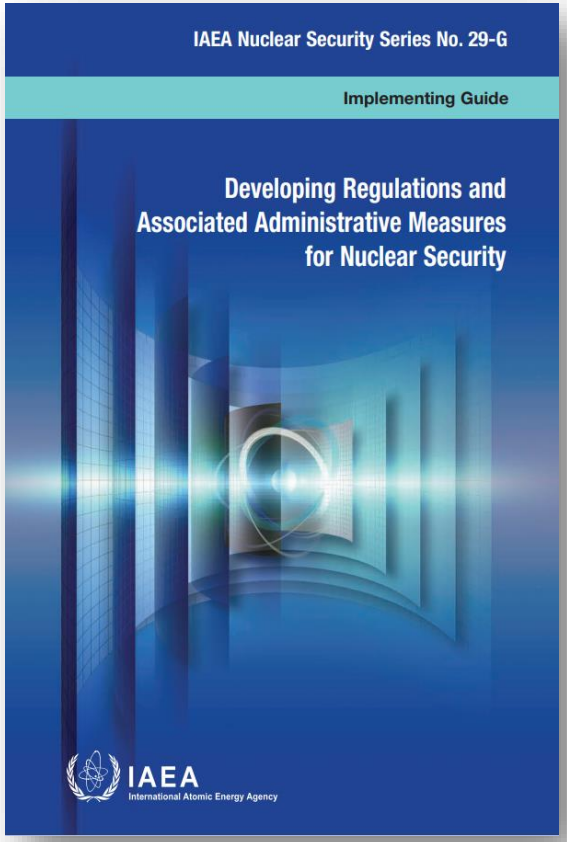
- This publication provides guidance on the State-level actions in 3 phases to establish an effective national nuclear security infrastructure for a nuclear power programme.

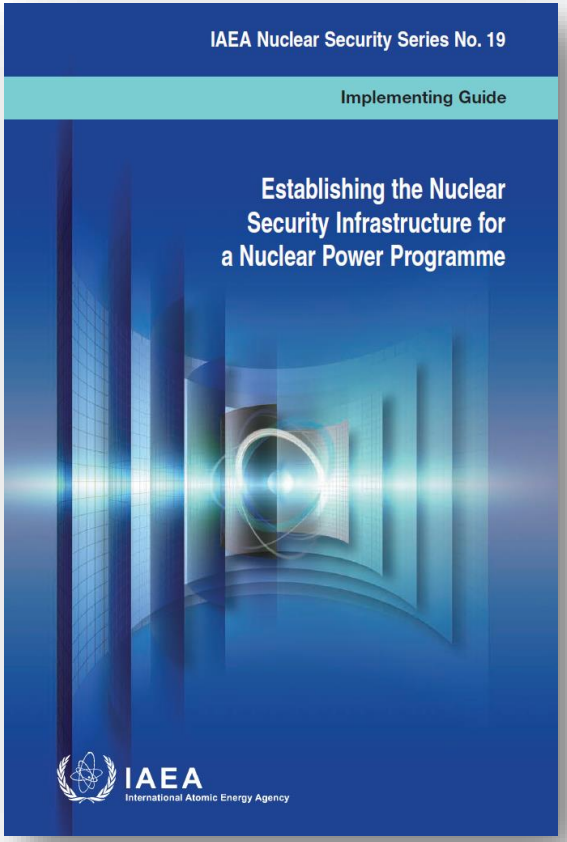
FIG. 1. Phases of infrastructure development for nuclear power.

Actions Required for NS Infrastructure Establishment

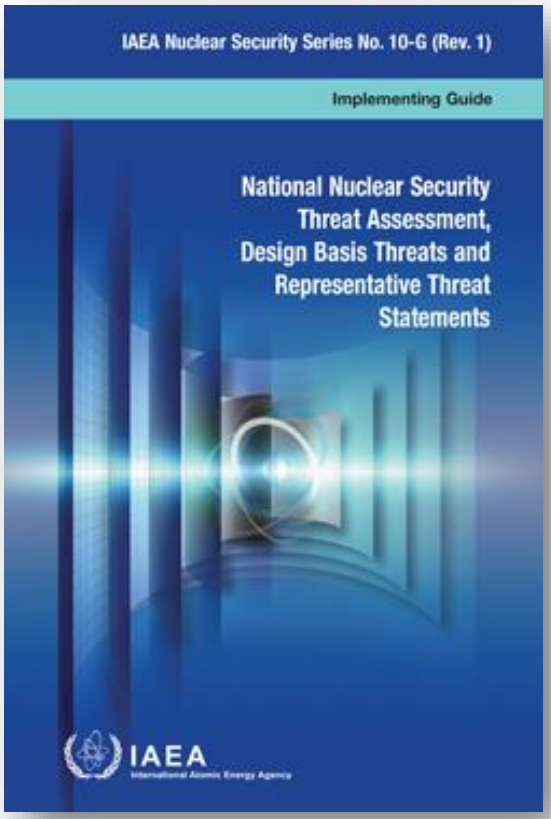
- This publication covers:
  - National policy and strategy (12 Actions =10+1+1)
  - Legal and regulatory framework (26 Actions =3+16+7)
  - Threat Assessment (18 Actions =2+11+5)
  - Management System (43 Actions = 10+25+8)
  - Development of a nuclear security infrastructure for:
    - Nuclear material and facilities (39 Actions =0+9+30)
    - Radioactive material, associated facilities and activities (24 Actions)
    - Systems and measures to address material out of regulatory control (31 Actions)
  - International cooperation (18 Actions)

Question and Answer





Implementation of: Threat Assessment, DBT and RTS



Mr. Hyungmin "Ricky" Seo

Nuclear Security Officer, Integrated Nuclear Security Approaches Unit, Nuclear Security of Materials and Facilities Section, Division of Nuclear Security, IAEA

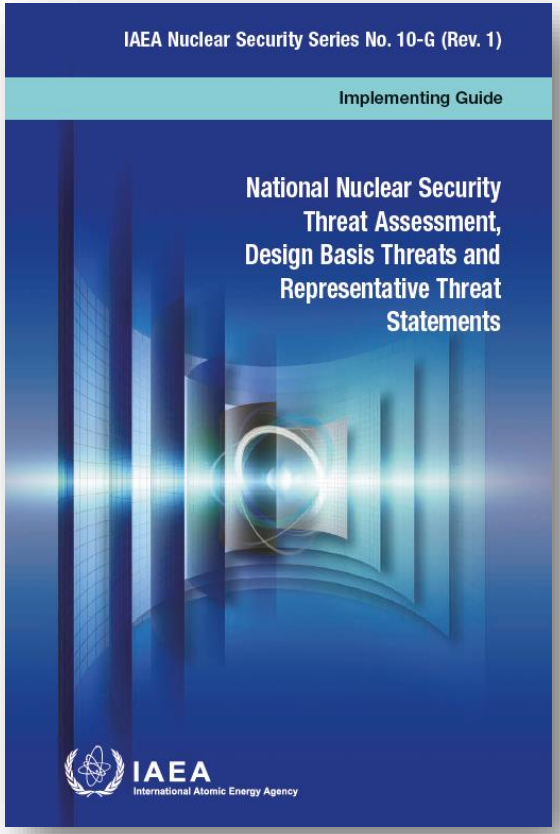
Fundamental Principle G

Threat

The State's physical protection should be based on the State's current evaluation of the threat.

- States should apply a threat-based approach in establishing nuclear security regime and State's assessment of nuclear security threats should be kept up to date
- Threat Assessment is an important first step towards establishment of a sustainable nuclear security systems and measures
- [NSS13] The appropriate State authorities, using various credible information sources, should define the threat and associated capabilities in the form of a threat assessment and, if appropriate, a design basis threat.

Implementing Guide on Threat Assessment, DBT and RTS



- This publication provides a step by step methodology for conducting a national nuclear security threat assessment, including both physical and computer security aspects, and for developing, using and maintaining design basis threats and representative threat statements.
- It is intended for use by States, competent authorities (including the regulatory body), relevant technical and scientific support organizations, and the operators of facilities and activities associated with nuclear material and other radioactive material, including shippers and carriers.

Overview of Content

- Description on National Nuclear Security Threat Assessment and the use of a Risk Informed Approach
- Process of conducting a National Nuclear Security Threat Assessment
- Process for the development of Design Basis Threats and Representative Threat Statements
- Roles and responsibilities of State, Competent Authorities, Operators and other Involved Organizations
- Use of Design Basis Threats and Representative Threat Statements and related regulatory approaches within regulatory framework
- How to maintain the validity of National Nuclear Security Threat Assessment, Design Basis Threats and Representative Threat Statements

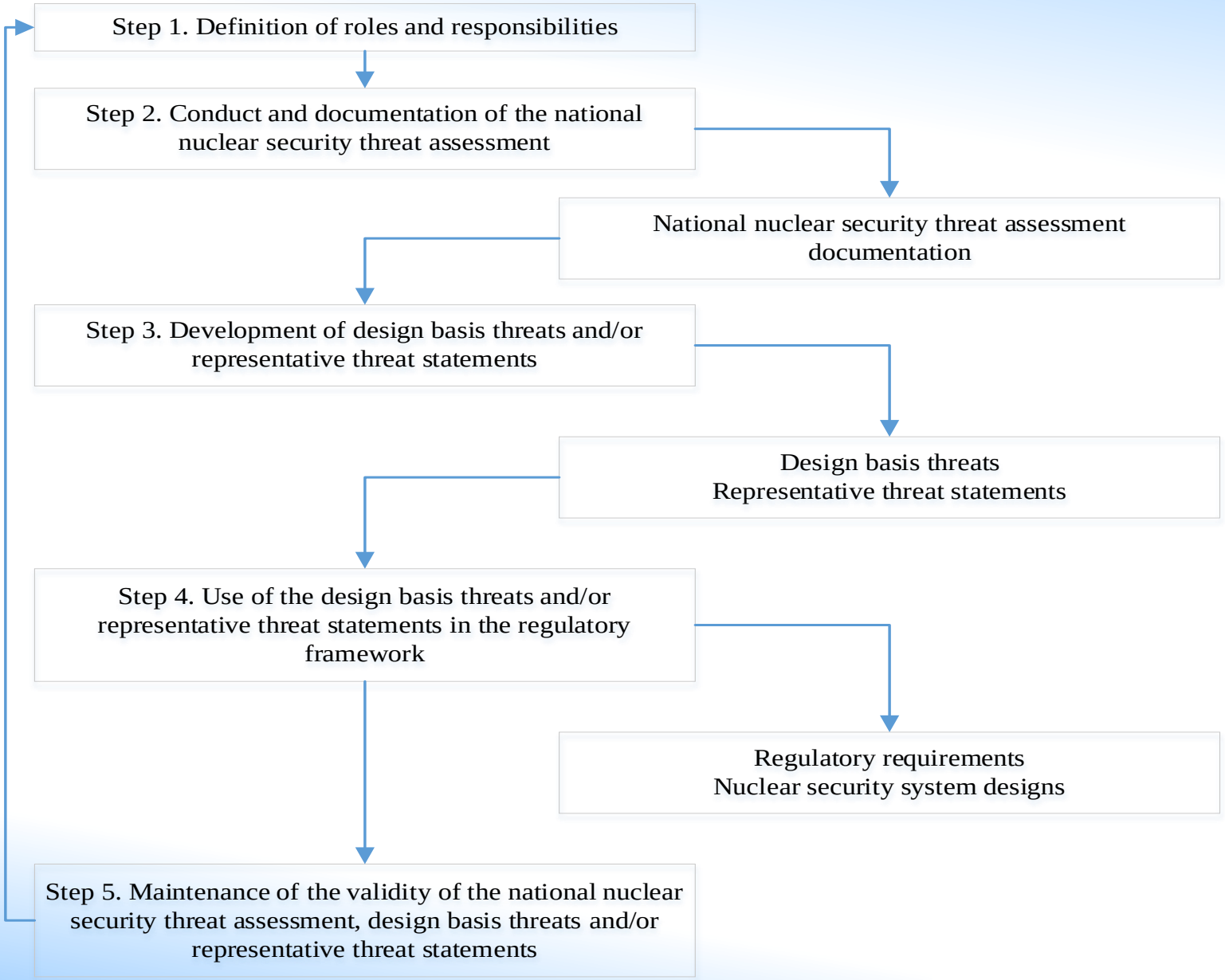
Regulatory Approach – DBT and RTS

- States may choose to develop Design Basis Threat (DBT) or Representative Threat Statement (RTS), or may use both along with a suitable regulatory approach for different types of facility and activity.
- A RTS can be used to develop prescriptive requirements for a particular subset of lower consequence materials or facilities to be protected
- A DBT can be used to implement a performance based approach to protect a specific higher consequence facility or activity.
  - Unauthorized removal of Category I nuclear material
  - Sabotage of nuclear material and nuclear facilities that have high radiological consequences

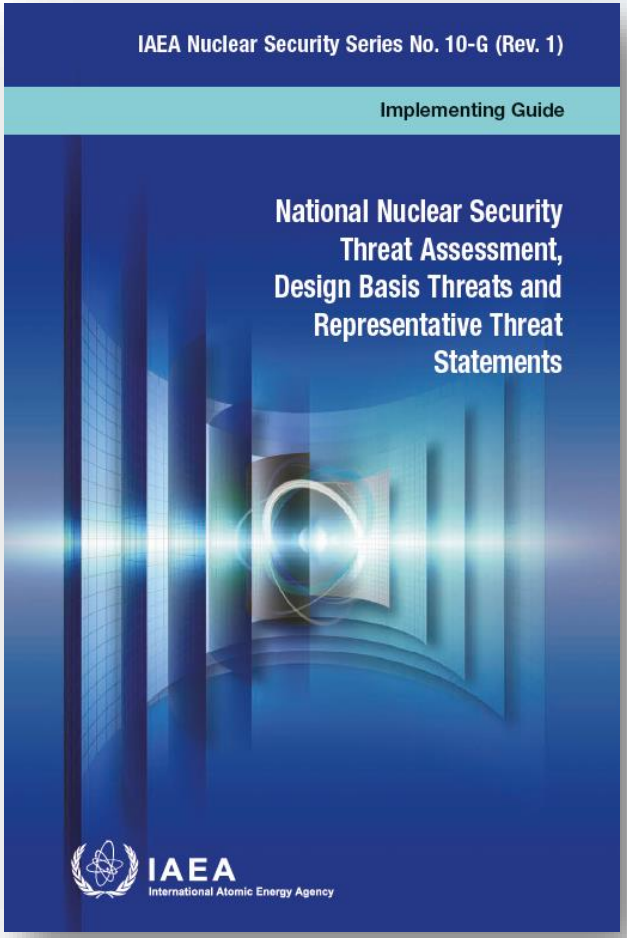
Changes in NSS 10-G (Rev. 1)

- New definition of threat statement
- Use the term ‘Representative Threat Statement’ instead of ‘Alternative Threat Statement’
- Elaborate more on:
  - Computer related threats
  - Local threats
  - Insider threats
  - Blended attacks: physical & cyber, insider & outsider threats
- Provide additional guidance on:
  - Use of DBT/RTS in different regulatory approaches including a combined approach
  - Developing attack scenarios
  - Responding to new and emerging threats

Updated process



Question and Answer



Implementation of: Physical Protection Measures and Systems

Mr. Garl Bultz

Senior Nuclear Security Officer, Nuclear Material Security Unit, Nuclear Security of Materials and Facilities Section, Division of Nuclear Security, IAEA

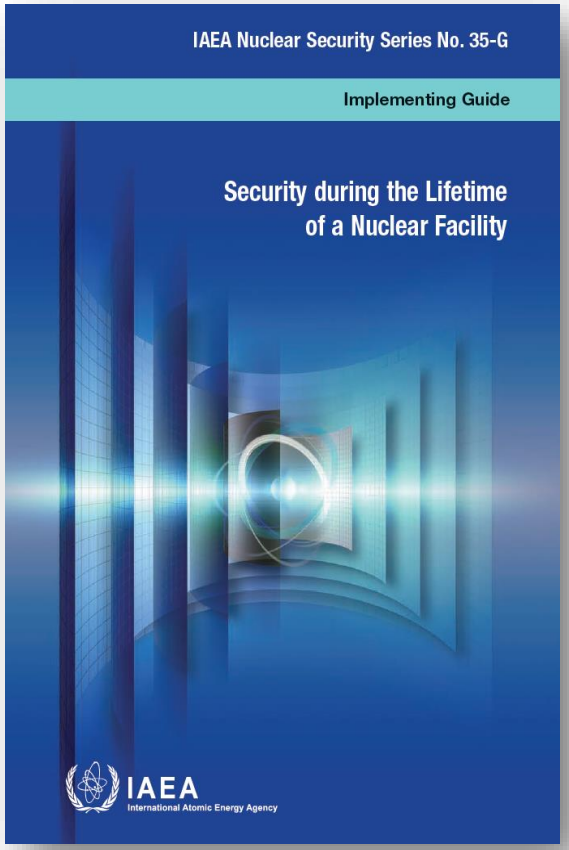
Fundamental Principle A

Responsibility of the State

The responsibility for the establishment, implementation and maintenance of a physical protection regime within a State rests entirely with that State.

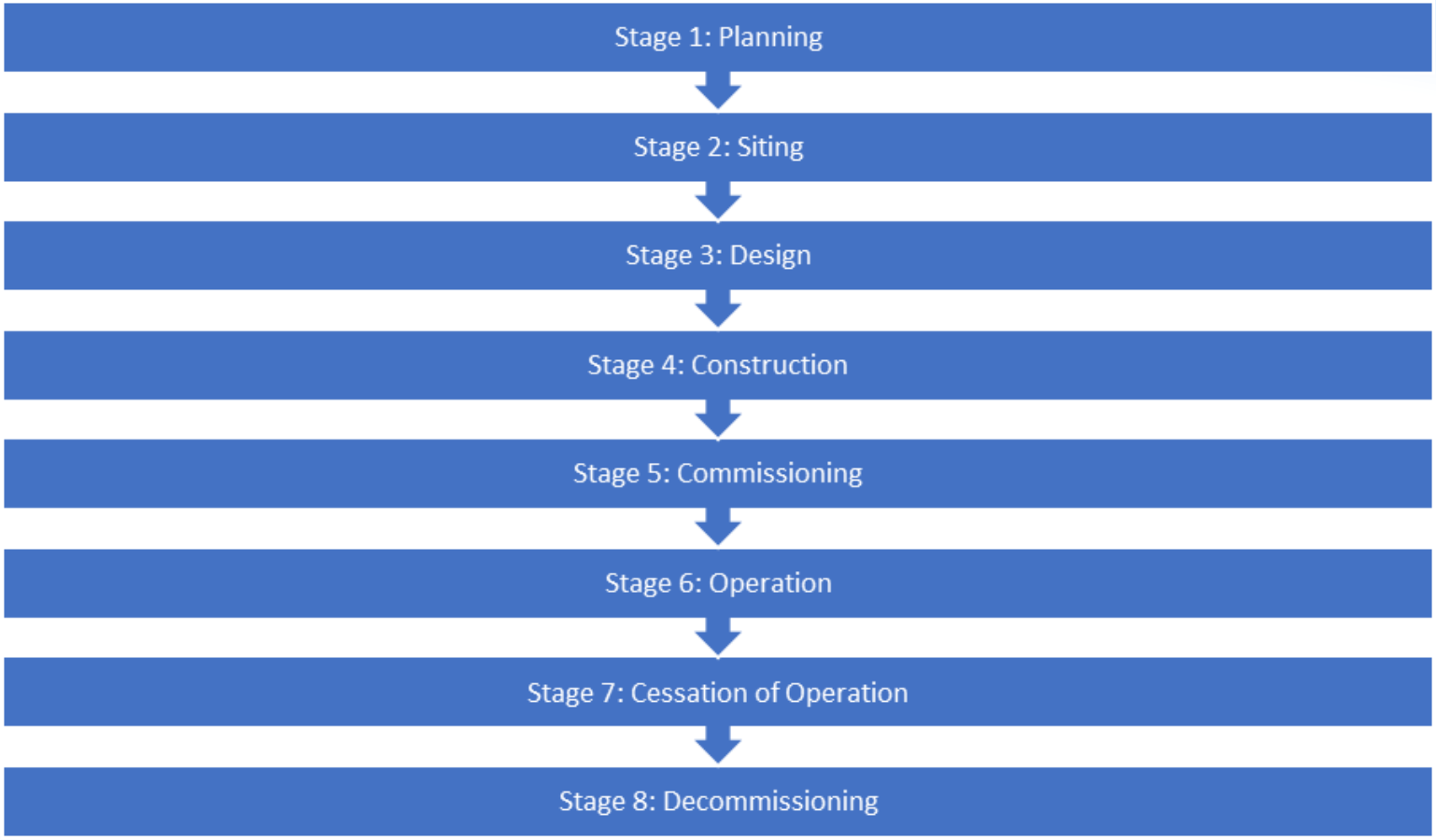
- Once established, maintaining an effective national nuclear security infrastructure **throughout the lifetime** of a nuclear facility is vital to ensure that nuclear and other radioactive material and their associated facilities and associated activities are securely protected and managed.

Implementation of Security



- The objective of this publication is to provide guidance to States, competent authorities and operators on appropriate nuclear security measures during each stage in the lifetime of a nuclear facility, from initial planning of the facility through to its final decommissioning.
- This publication also addresses effective nuclear security in the transition between the stages.

Lifetime Stages of a Nuclear Facility



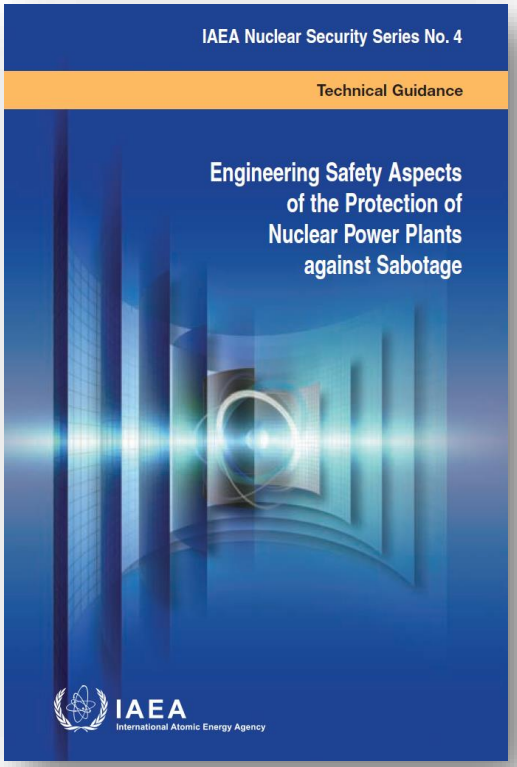
Fundamental Principle G

Threat

The State's physical protection should be based on the State's current evaluation of the threat.

- When considering the threat, due attention should be given to potential acts of sabotage to nuclear facilities that may have radiological consequences.

Protecting Against Sabotage



- This publication addresses only issues related to the sabotage of nuclear facilities that may have potential radiological consequences.
- The overall objective of this publication is to provide methods for evaluating, and, if necessary, for proposing corrective actions aimed at reducing (mainly through upgrades) the risk against a nuclear power plant

Scope of Sabotage Considered

Definition

Sabotage is any deliberate act directed against a nuclear facility or nuclear and other radioactive material in use, storage, or transport which could directly or indirectly endanger the health and safety of personnel, the public and the environment by exposure to radiation or the release of radioactive substances [NSS 13].

Events that are considered to be within the scope of this publication:

- Involve forced intrusion into the protected area of the site
- Are initiated by persons outside the site area
- Are initiated by insiders
- Include multiple modes of attack

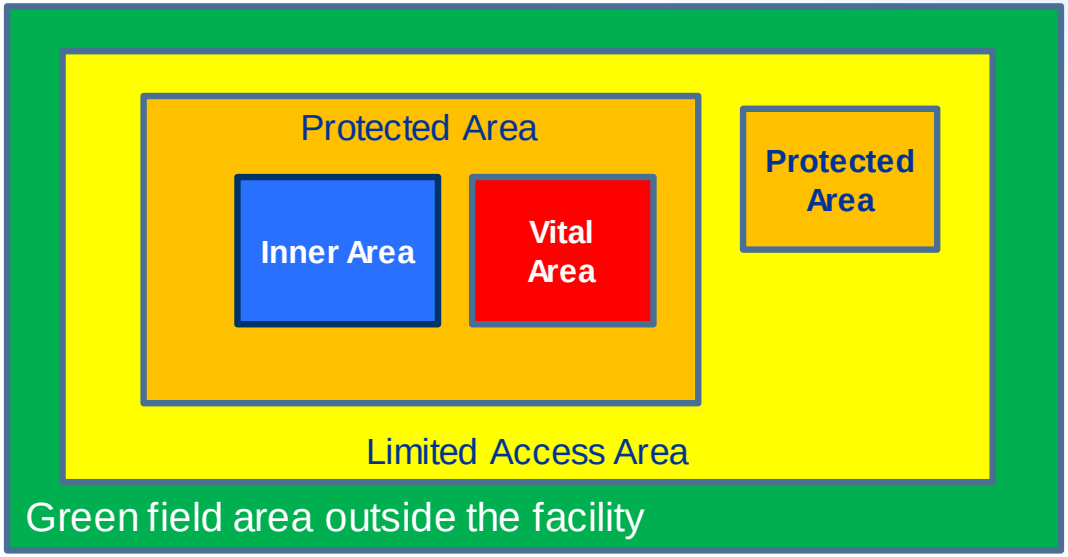
Fundamental Principle H

Graded Approach

Physical protection requirements should be based on a graded approach, taking into account the current evaluation of the threat, the relative attractiveness and nature of the material, and potential consequences associated with the unauthorized removal of nuclear material and sabotage of nuclear material or nuclear facilities.

- Vital areas are an example of the graded approach, as they require additional protection based on the risk associated with the contents within its perimeter

Defence In Depth and Graded Approach



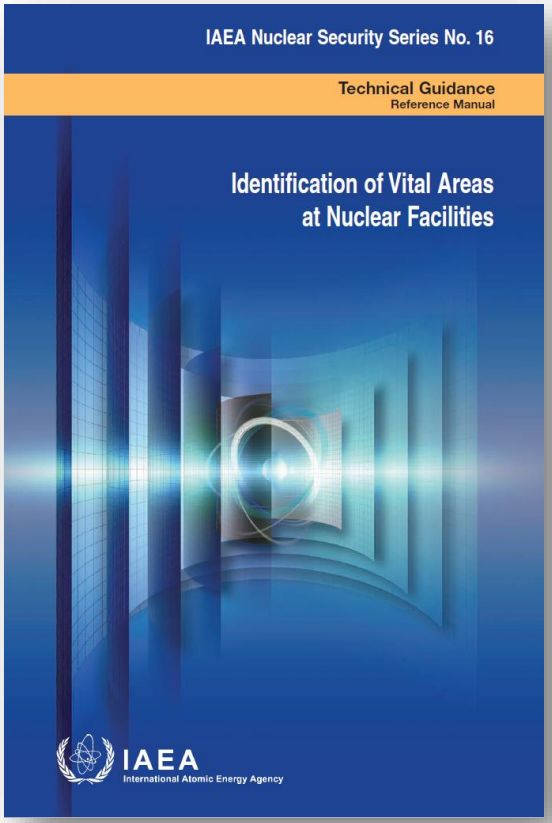
All other areas of nuclear facility, some of which may contain Category III Material, the out blue line of which represents the perimeter of the nuclear facility

Contains Category I Material

Category II Material, targets between the URC and HRC and inner and/ or Vital Area, the outer blue line of which represents the perimeter of the protected area

Contains targets, the sabotage of which may lead to HRC

Vital Areas



- This publication provides detailed guidance on the identification of vital areas.
- A structured approach to identifying the areas that contain equipment, systems and components to be protected against sabotage is presented.
- The method of identification utilizes the safety analyses, in order to develop sabotage logic models for sabotage scenarios that could cause unacceptable radiological consequences.

Definition

A ***Vital Area*** is an area inside a protected area containing equipment, systems or devices, or nuclear material, the sabotage of which could directly or indirectly lead to unacceptable radiological consequences [NSS 16].

Vital Area Identification

The objective of this publication is to describe a process that can be used to:

- identify all candidate sets of vital areas at a nuclear facility; and
- select a specific set of vital areas that will be protected.

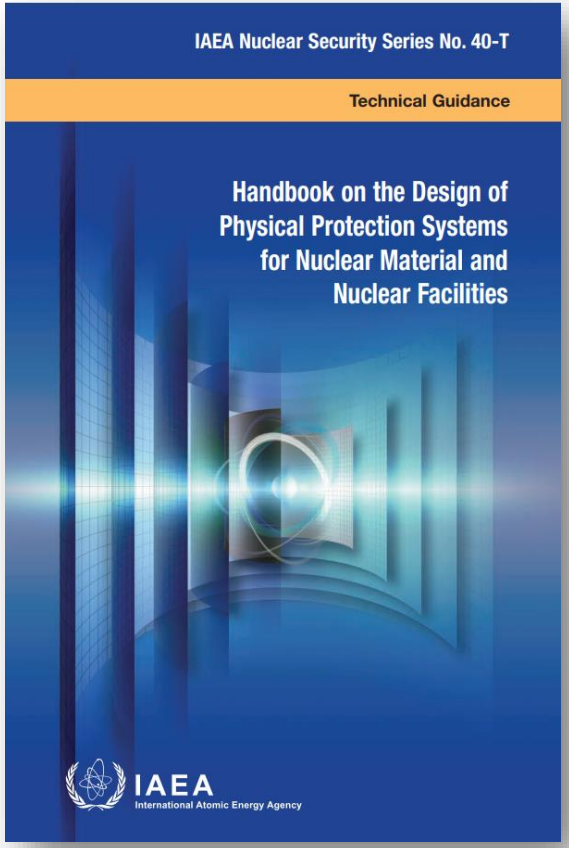
Fundamental Principle I

Defense in Depth

The State's requirements for physical protection should reflect a concept of several layers and methods of protection.

- A physical protection system (PPS) is designed to meet the fundamental principle of defense in depth by creating layered security or concentric security areas centered on identified targets, which increases the opportunities to prevent the completion of both unauthorized removal of nuclear material and sabotage of nuclear facilities.
- Sufficiently implementing a PPS, on a graded approach (Fundamental Principle: H), requires the consideration of the current threat assessment (Fundamental Principle: G), and additional factors such as the relative attractiveness and categorization of the material.

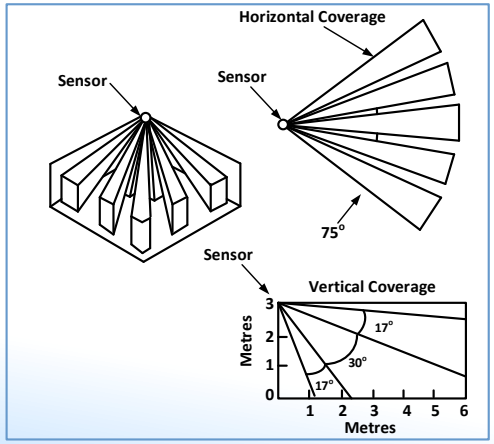
Technical Guide on Designing Physical Protection Systems

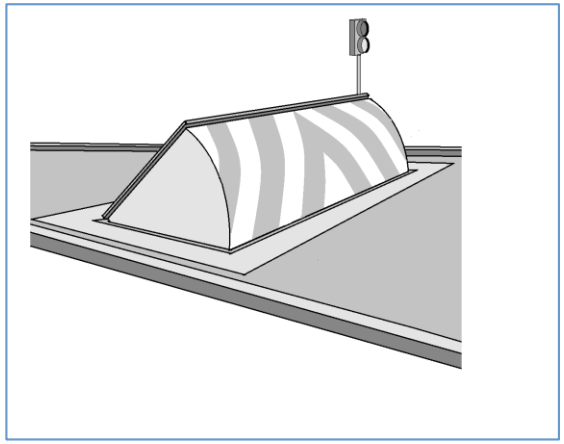


This publication provides further technical detail on how to design and evaluate a PPS, with respect to the selection and integration of appropriate, effective physical protection measures.

Considerations for PPS Design

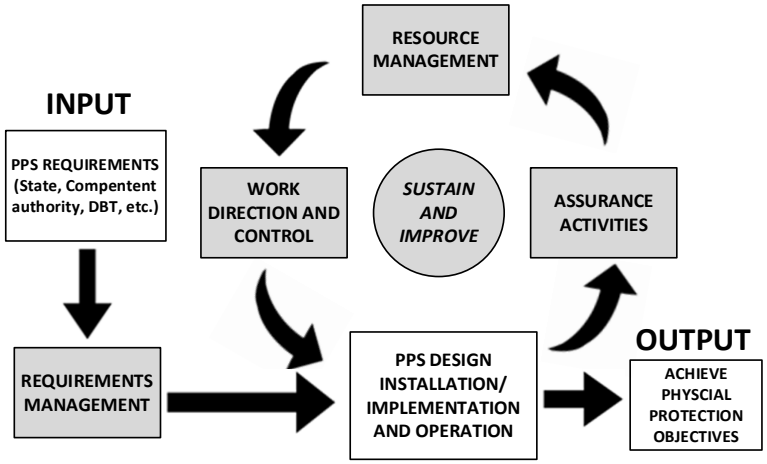
- Key functions of a physical protection system
- Design and evaluation of physical protection systems
- Physical protection equipment
- Response
- Physical protection system networks and support systems





Considerations for PPS Design Cont.

- Evaluating new and emerging technologies
- Periodic testing
- Physical protection system analysis
- Management systems for physical protection systems



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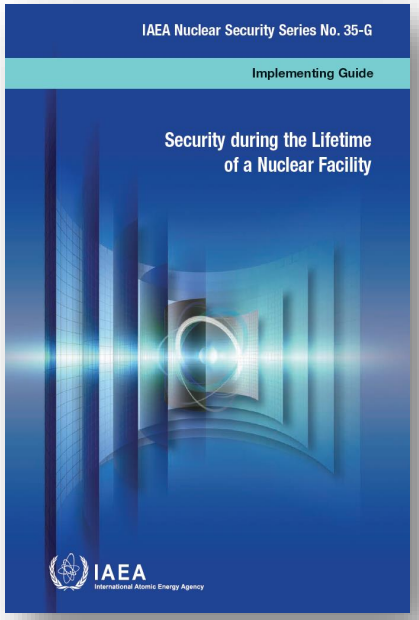
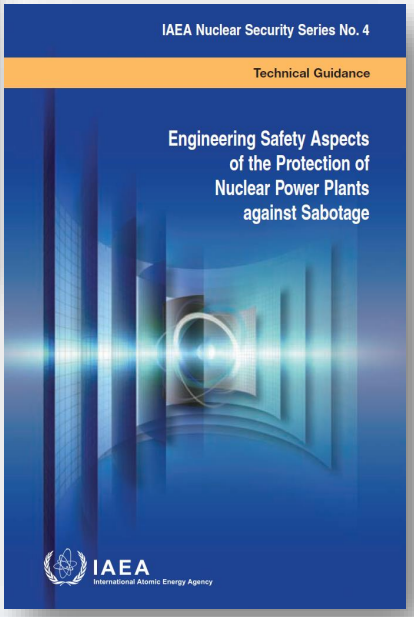
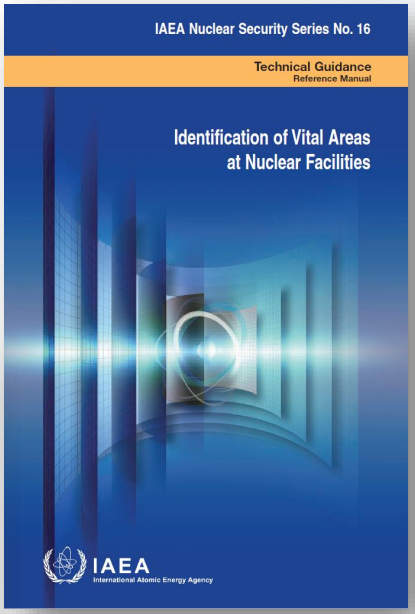
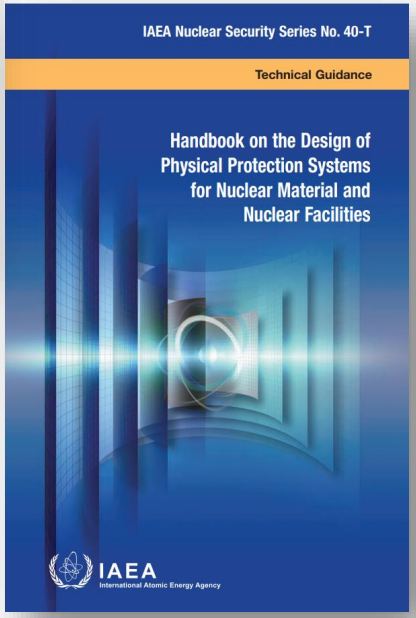


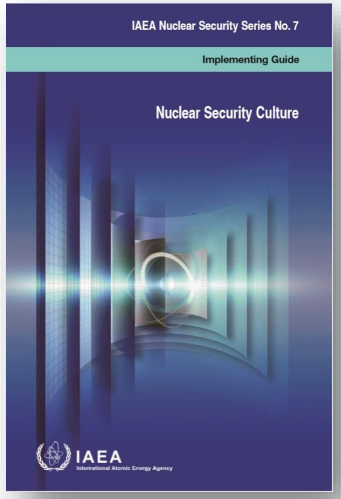


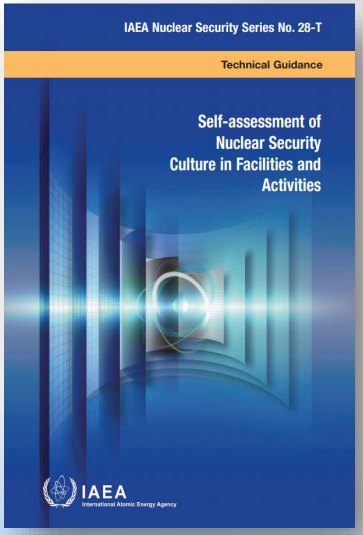


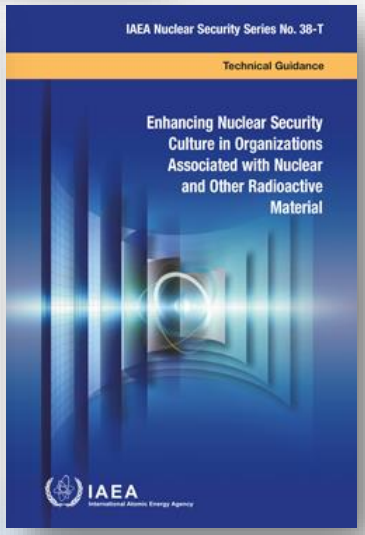



10-Minute Break

Implementation of: Nuclear Security Culture







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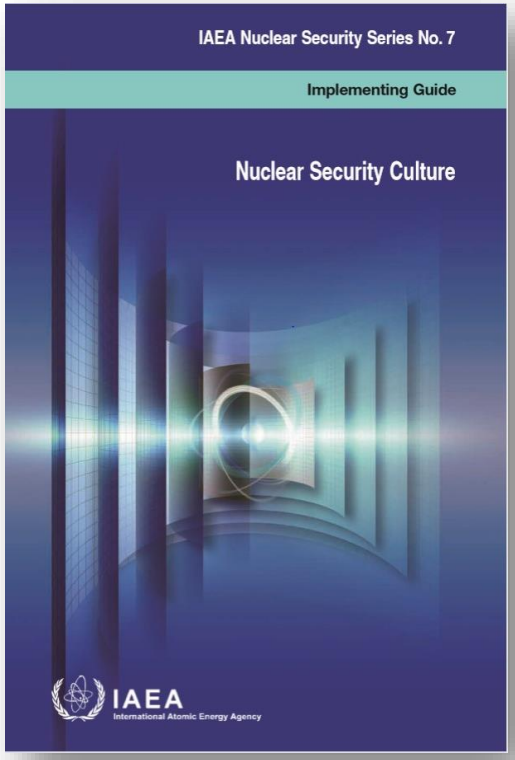
Fundamental Principle F

Security Culture

All organizations involved in implementing physical protection should give due priority to the security culture, to its development and maintenance necessary to ensure its effective implementation in the entire organization.

- Security culture includes characteristics and attitudes in organizations and of individuals which establish that physical protection issues receive the attention warranted by their significance.

Nuclear Security Culture: IAEA Model



IAEA Implementing Guide on Nuclear Security Culture (2008)

- Defines nuclear security culture

Definition

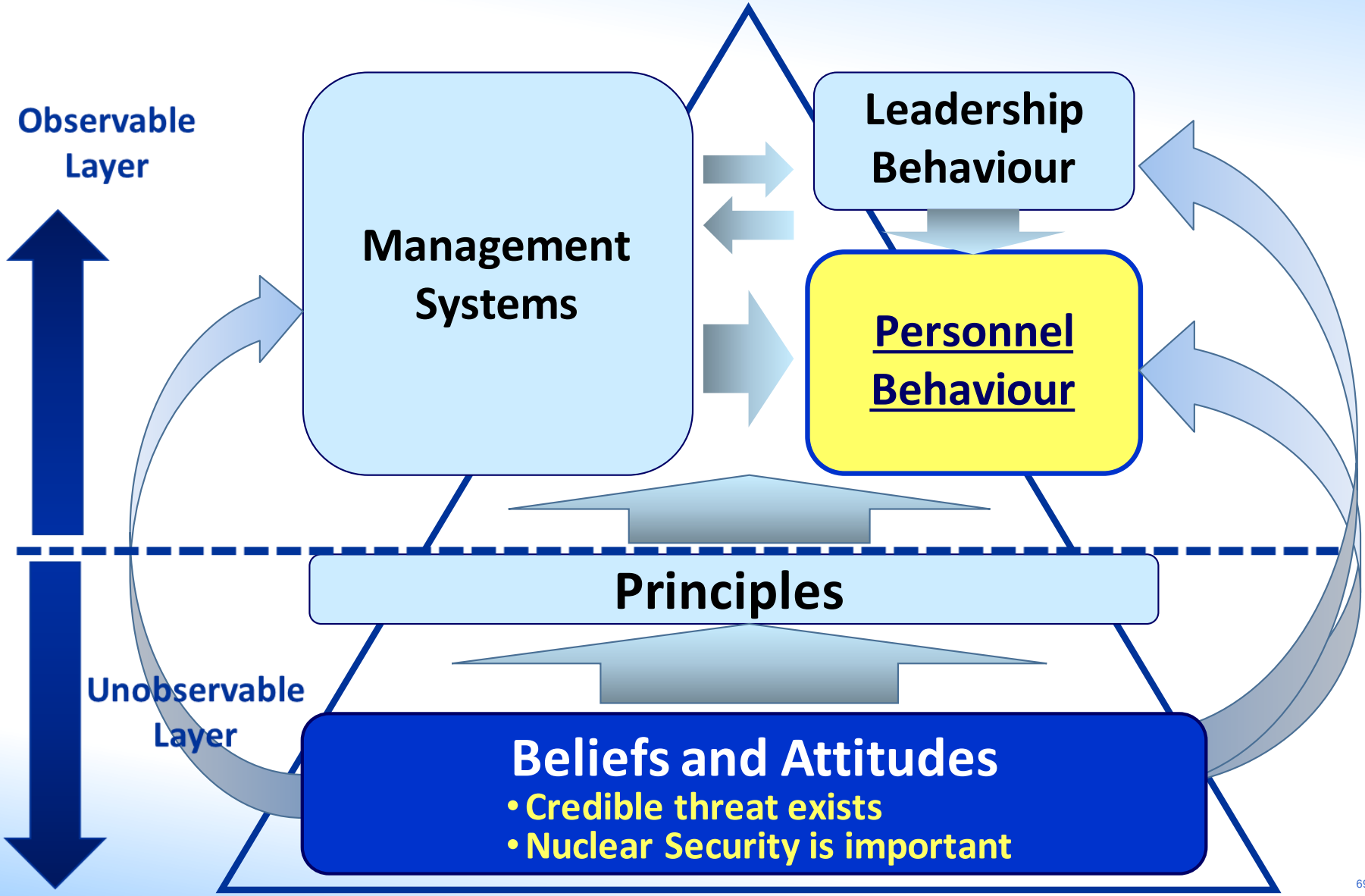
Nuclear Security Culture is the assembly of characteristics, attitudes and behaviour of individuals, organizations and institutions which serves as a means to support and enhance nuclear security [NSS 7].

- Roles and responsibilities of institutions and individuals
- Provides the model for security culture
- Identifies general characteristics of security culture and examples for indicators

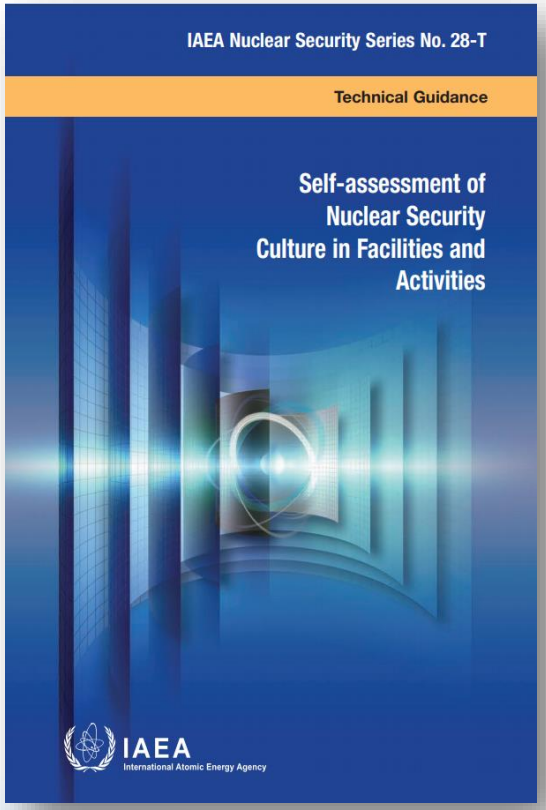
Draws directly on Schein's work on Organisational Culture

IAEA Nuclear Security Culture Model

IAEA Nuclear Security Culture Model – Interactions in three layers



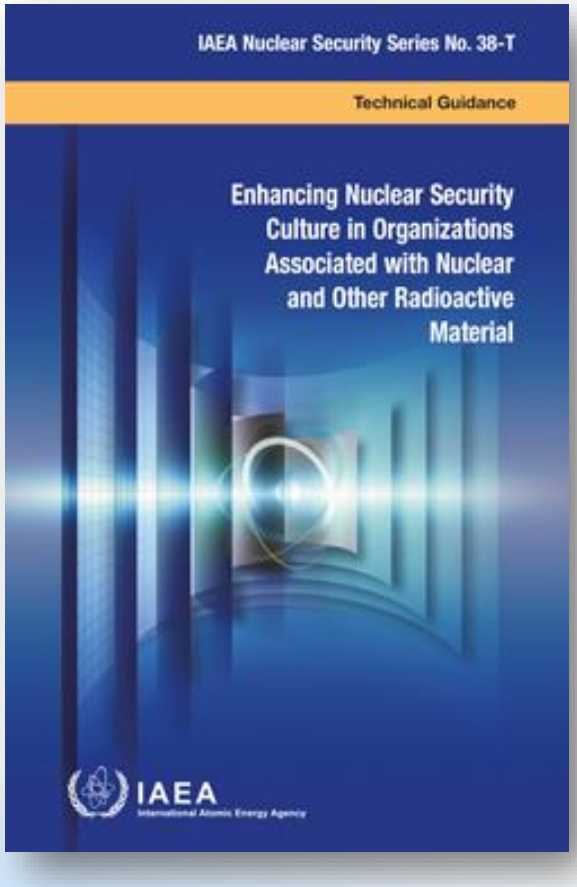
Self-Assessment of Nuclear Security Culture in Facilities and Activities



<u>Provides a practical solution</u> to applying the nuclear security culture concept defined in NSS No.7 by:

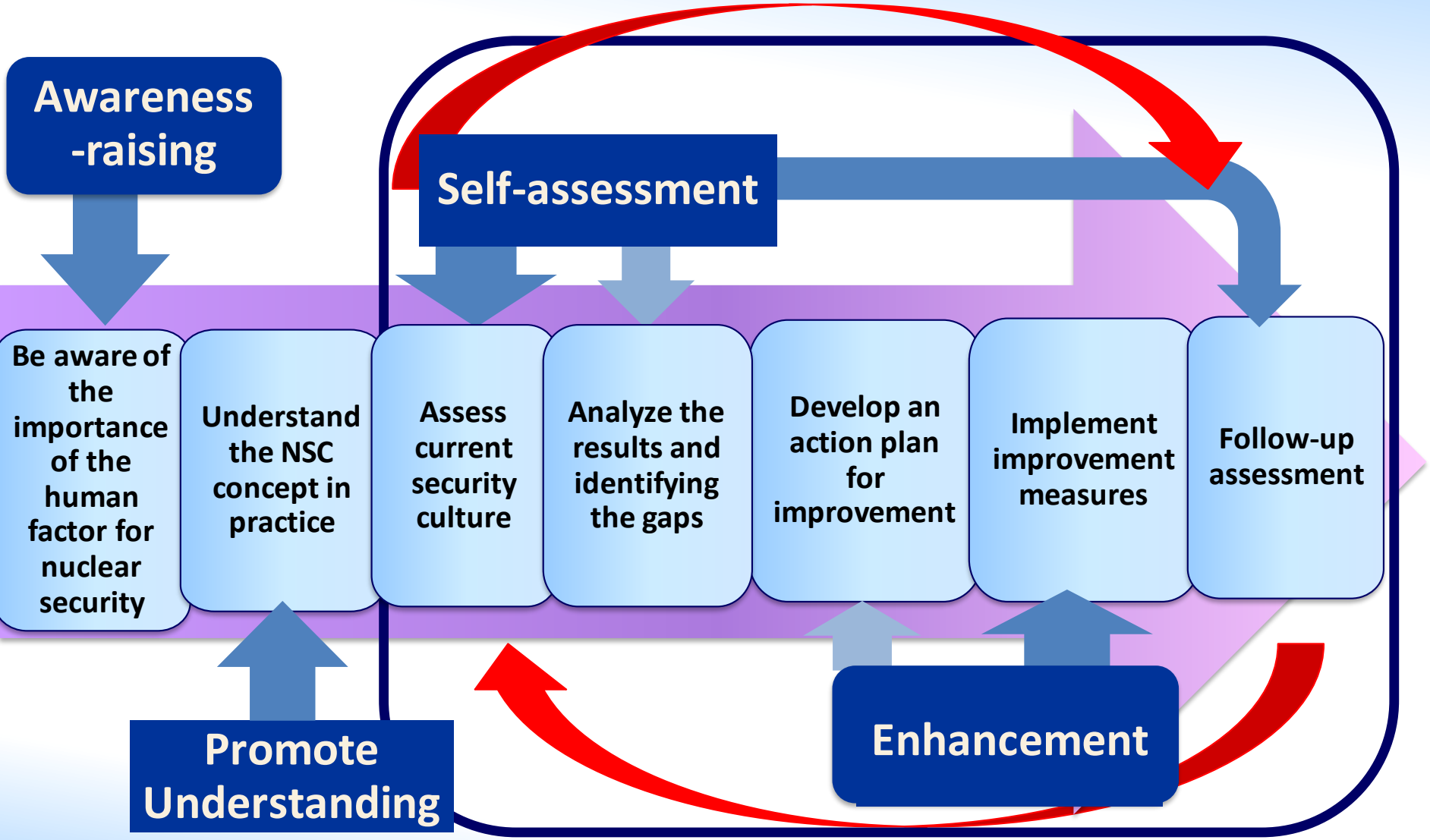
- ***Providing guidance*** on performing nuclear security culture self-assessment in facilities and activities;
- ***Defining a generic methodology*** to perform nuclear security culture self-assessment at various types' facilities and activities; and
- ***Providing self-assessment tools and references*** to assist Member States in initiating and regularly conducting nuclear security culture self-assessment

Enhancing Nuclear Security Culture

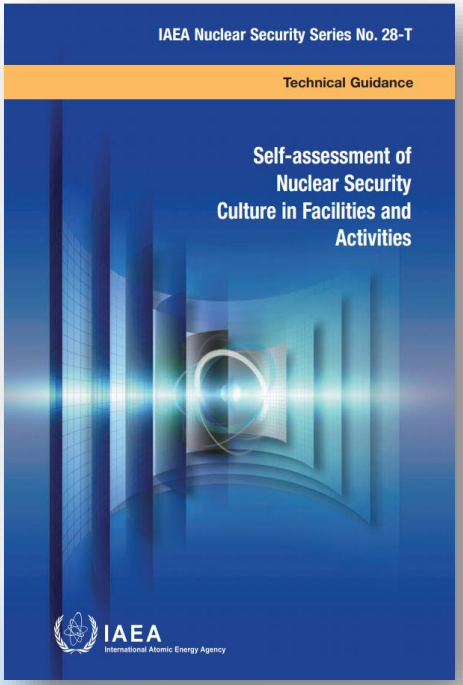


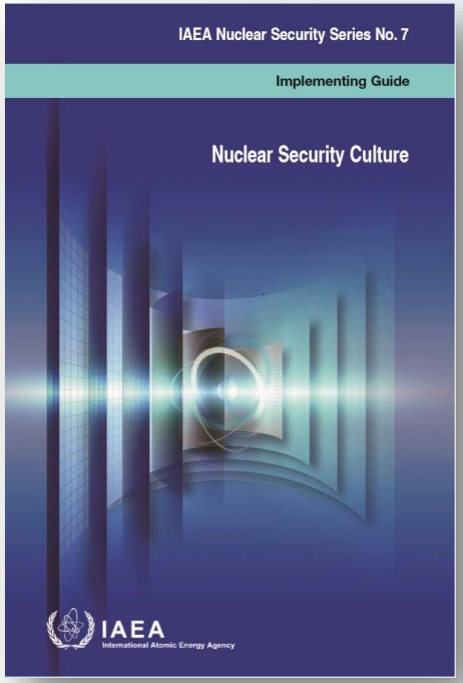
- This publication provides practical guidance on how to implement a systematic nuclear security culture enhancement programme.
- The approach to enhancing nuclear security culture presented in this publication can continuously improve nuclear security and help organizations successfully fulfil their missions

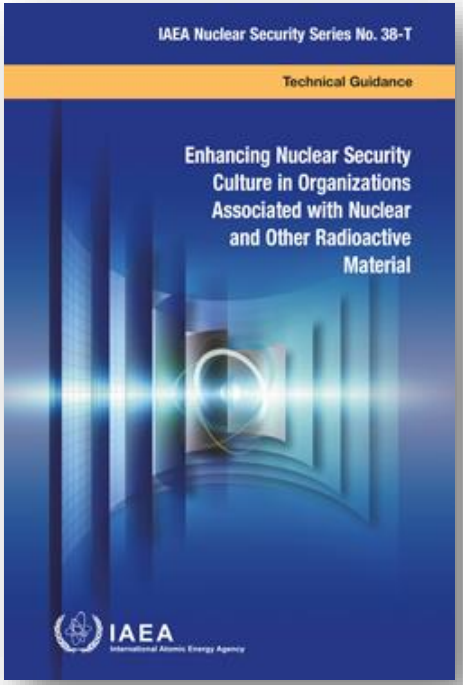
The Mechanism to Promote, Enhance, and Sustain a Nuclear Security Culture



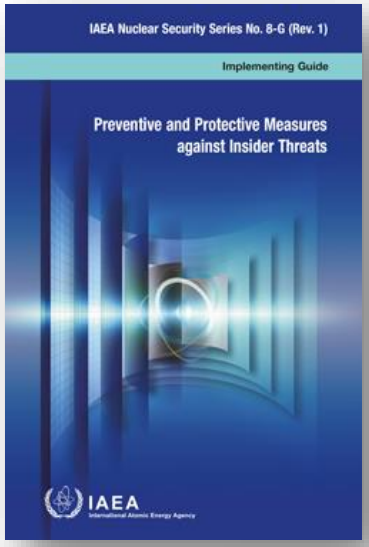
Question and Answer

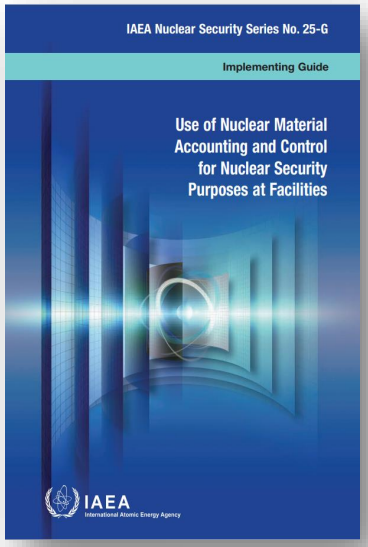


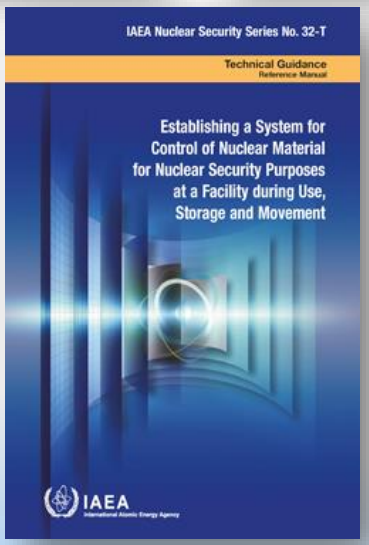




Implementation of the Insider Threat Programme and the NMAC System







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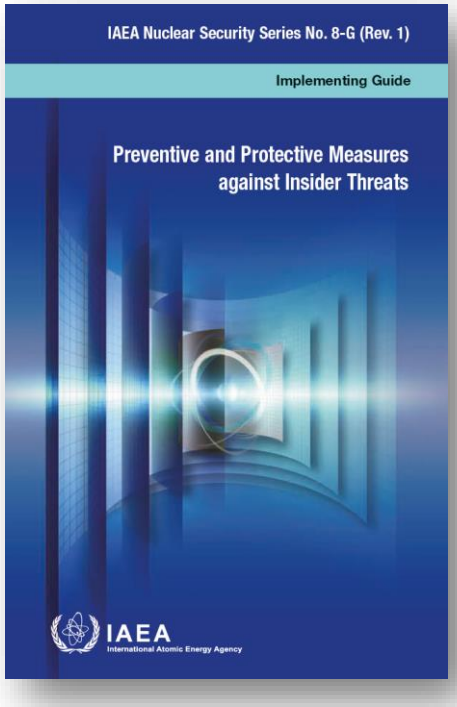
Fundamental Principle G

Threat

The State's physical protection should be based on the State's current evaluation of the threat.

- When considering the threat, due attention should be paid to insiders. They can take advantage of access, authority and knowledge.

Threats Posed by Insiders



- This revised publication provides updated guidance on implementing and evaluating measures for addressing the threats posed by insiders.
- This publication applies to preventing and protecting against unauthorized removal of nuclear material and sabotage of nuclear material and facilities by insiders.

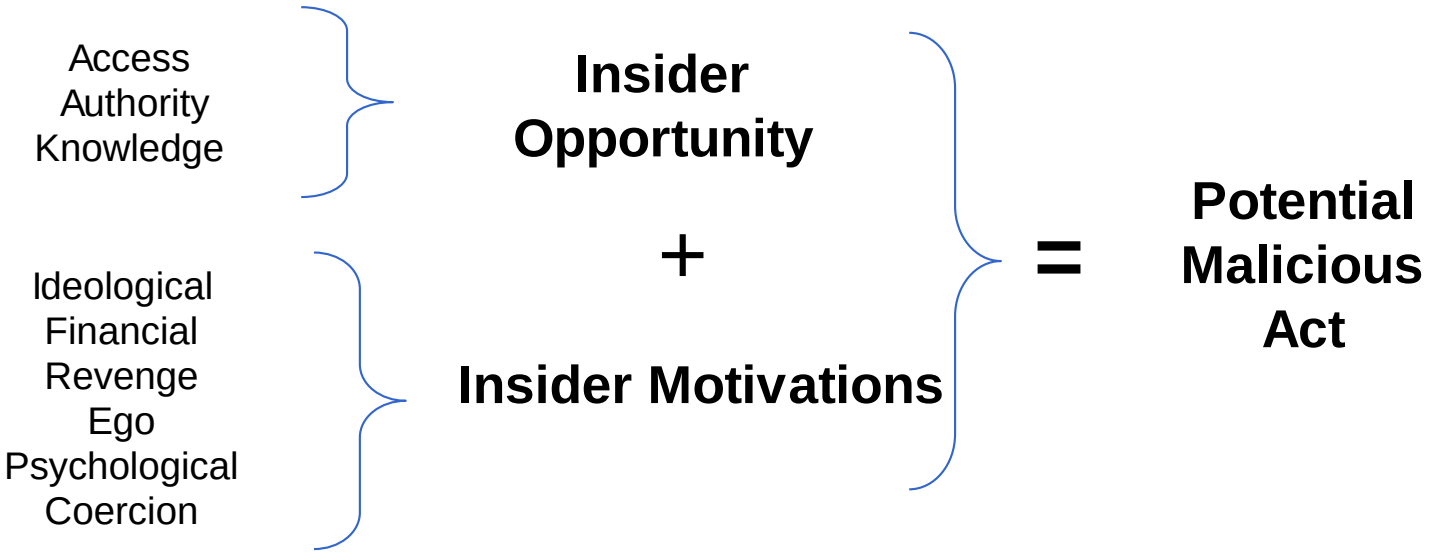
Definition

An ***insider*** is an individual with authorized access who could commit or facilitate the commission of malicious acts to include unauthorized removal or sabotage of nuclear material or other radioactive material [NSS 8-G Rev. 1]."

Insiders

- Attributes
  - Access, authority and knowledge
- Motivations
  - Money, ideology, revenge, ego, coercion or a combination of these motivations
- Categories of insider adversaries
  - Passive
  - Active (violent or non-violent)
  - Unwitting

Formula for Potential Malicious Act



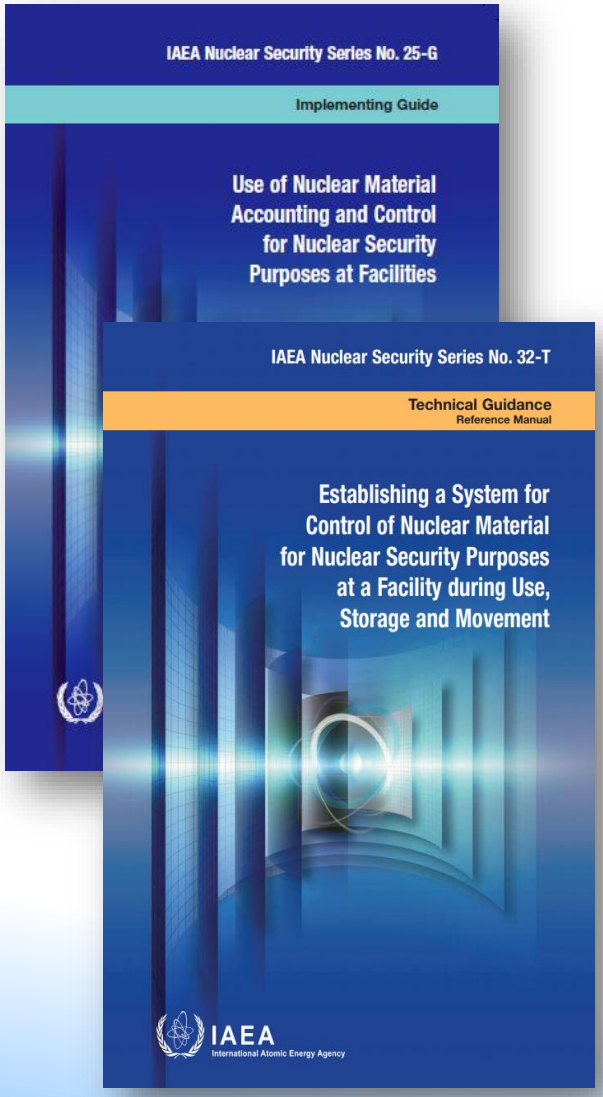
Fundamental Principle E

Responsibility of the Licence Holders

The State should ensure that the prime responsibility for the implementation of the physical protection of nuclear material or of nuclear facilities rests with the holders of the relevant licences or of other authorizing documents (e.g. operators or shippers).

- The operator should ensure control of, and be able to account for, all nuclear material at a nuclear facility at all times. The operator should report any confirmed accounting discrepancy in a timely manner as stipulated by the competent authority.

Nuclear Material Accounting and Control (NMAC) for Nuclear Security Purposes

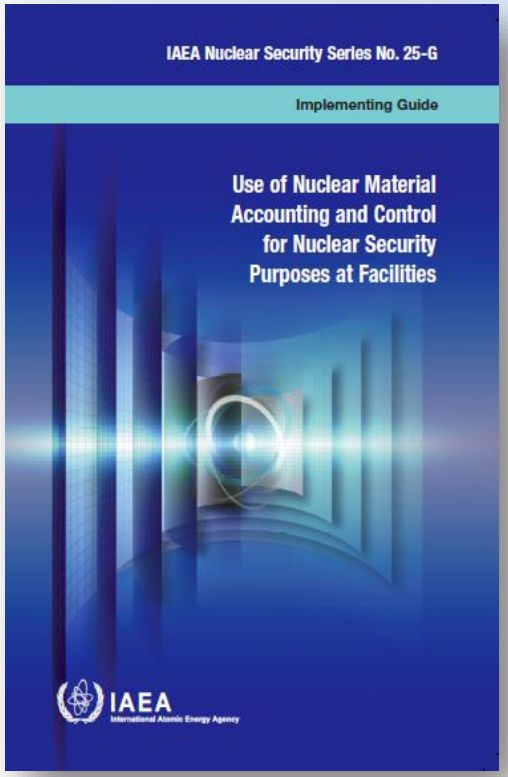


- Domestic NMAC for nuclear security is focused on the threat posed by a non-State actor.
- These publications offer guidance on implementing NMAC at the nuclear facility level.
- NMAC works to prevent, deter and detect the unauthorized acquisition and use of nuclear materials.
- These publications offer the accounting and control measures to achieve timely detection of unauthorized removal.

Nuclear Material Accounting Content

NSS No. 25-G discusses:

- The regulatory framework of the NMAC system;
- Tailoring NMAC systems for nuclear security;
- Elements of an NMAC system at the facility level.
  - Managing the NMAC system;
  - Records;
  - Physical inventory taking of nuclear material;
  - Measurements and measurement quality control;
  - Nuclear material control;
  - Nuclear material movements;
  - Detection, investigation and resolution of irregularities;
  - Assessment and performance testing of the NMAC system.



Nuclear Material Control Considerations

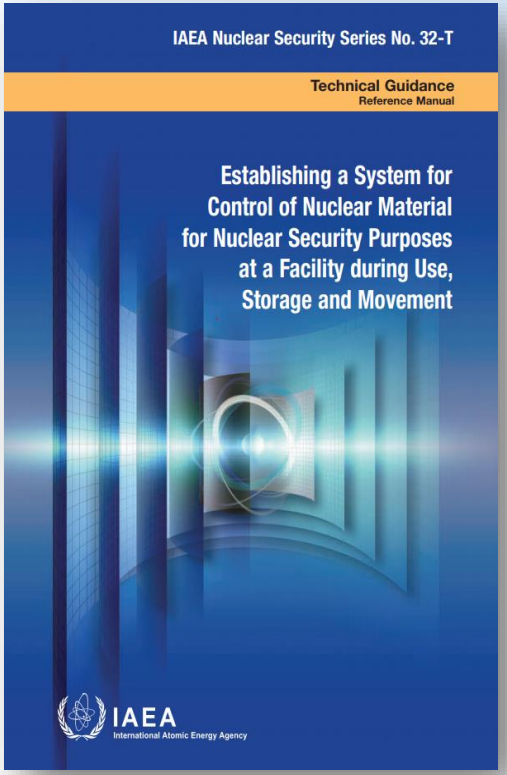
- Nuclear material accounting has its limitations.
  - Accounting measures alone do not achieve the fundamental security need for immediate detection in order to secure a timely response.
- Nuclear material controls in concert with physical protection most often allows for sensing and assessment to provide for timely detection and response.
- Controls is where NMAC and physical protection converge.

Accounting + Control + Physical Protection = Timely Detection

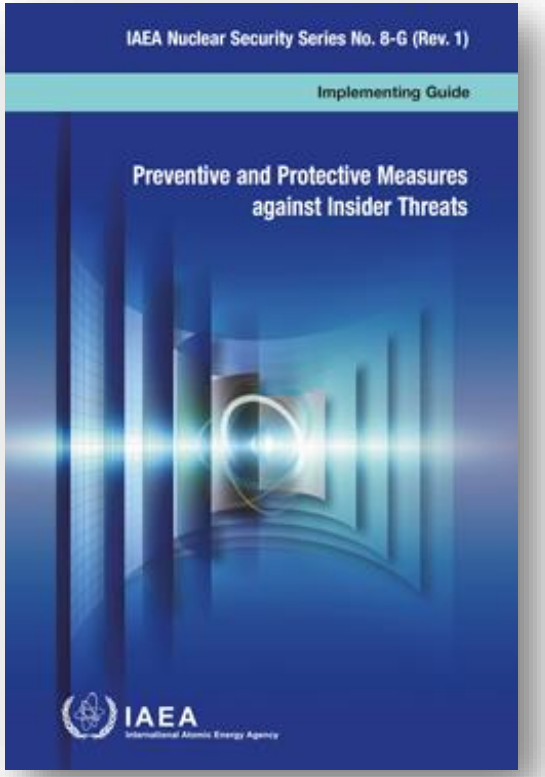
Nuclear Material Control Content

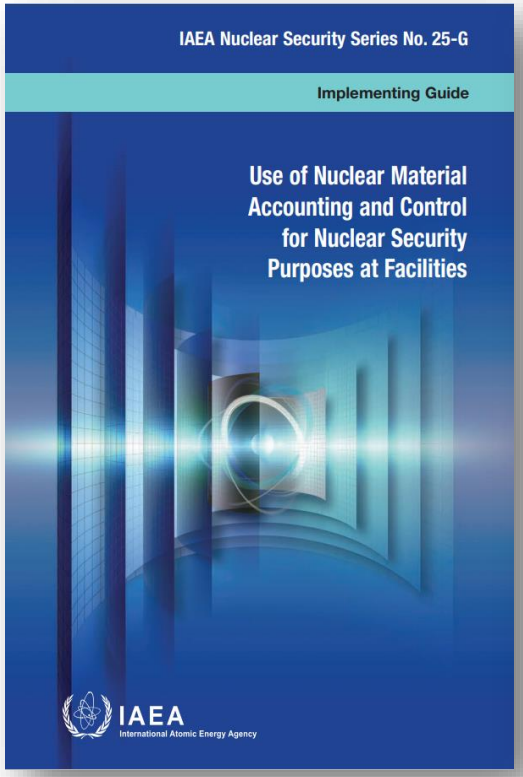
NSS No. 32-T discusses:

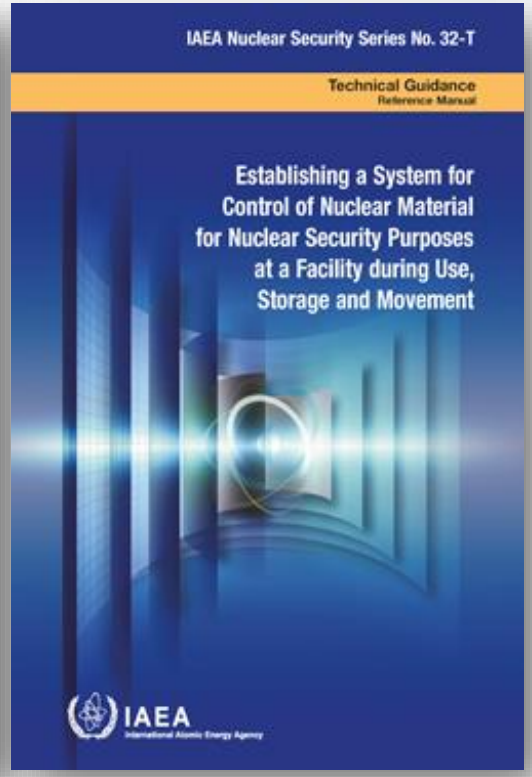
- Managing nuclear material control;
- Nuclear material control measures;
- Movement of nuclear material;
- Response to irregularities in nuclear material control;
- Evaluation of nuclear material control;
- Interface with the physical protection system.



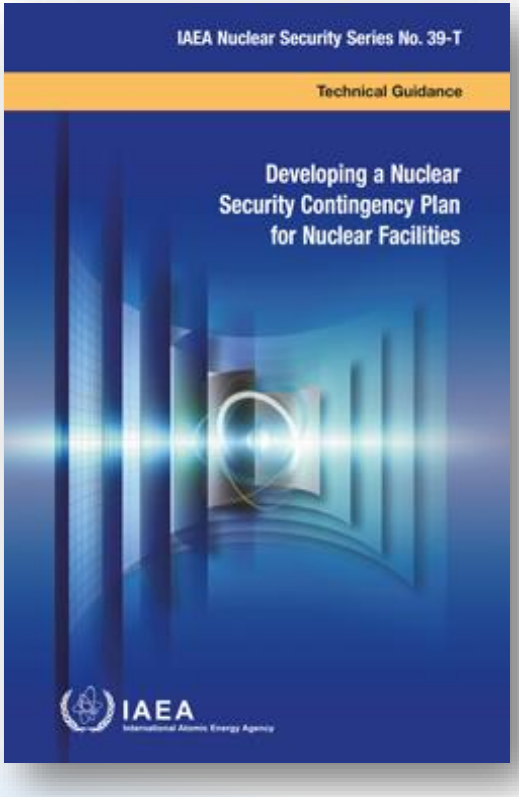
Question and Answer







Implementation of: Nuclear Security Contingency Plan



Mr. Oleg Bukharin

Senior Nuclear Security Officer, Transport Security Unit, Nuclear Security of Materials and Facilities Section, Division of Nuclear Security, IAEA

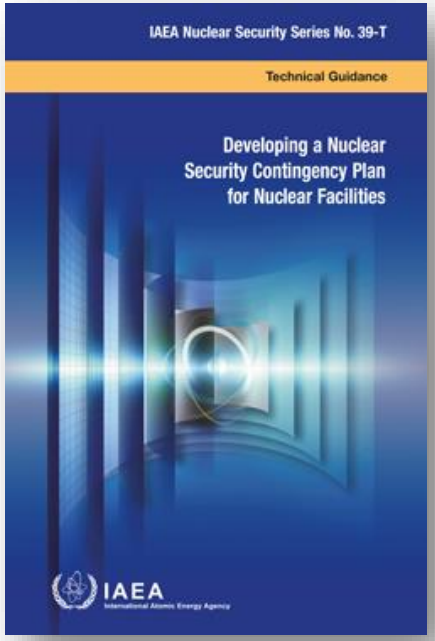
Fundamental Principle K

Contingency Plans

Contingency plans to respond to unauthorized removal of nuclear material or sabotage of nuclear facilities or nuclear material, or attempts thereof, should be prepared and appropriately exercised by all license holders and authorities concerned.

- The State's competent authority should ensure that the operator prepares contingency plans to effectively counter the threat assessment or design basis threat taking actions of the response forces into consideration.

Contingency Planning



- This publication provides guidance to States, competent authorities and operators on how to develop and maintain facility-level contingency plans for nuclear facilities.
- It includes guidance on the interface between contingency plans, which focus on nuclear security, and emergency plans, as required in IAEA Safety Standards Series No. GSR Part 7, Preparedness and Response for a Nuclear or Radiological Emergency.

Definition

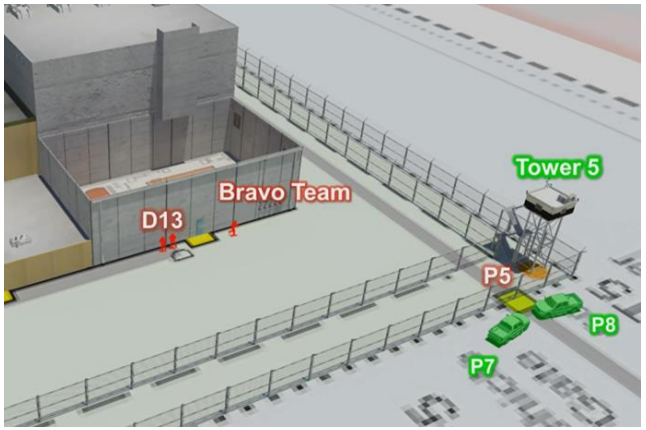
A ***Contingency Plan*** is predefined sets of actions for response to unauthorized acts indicative of attempted unauthorized removal or sabotage, including threats thereof, designed to effectively counter such acts [NSS 39-T].

Nuclear Security Contingency Response

- Contingency response is a pre-planned deployment and actions by security forces in response to a malicious activity

- Contingency response is an element of the DETECT-DELAY-**RESPOND** approach to physical protection

- Contingency response needs to be
  - Timely
  - Effective against the postulated threat (e.g. the DBT)
  - Coordinated with other response plans and activities



Credit: O.Bukharin, IAEA

Contingency Plan

- Contingency Plan
  - Identifies the types of security events to be addressed
  - For each event, describes response force actions, responsibilities, and supporting infrastructure
  - Addresses coordination with emergency- and off-site security response plans

- Competent authority should review and approve the plan as part of the licensing process

Examples of types of security events

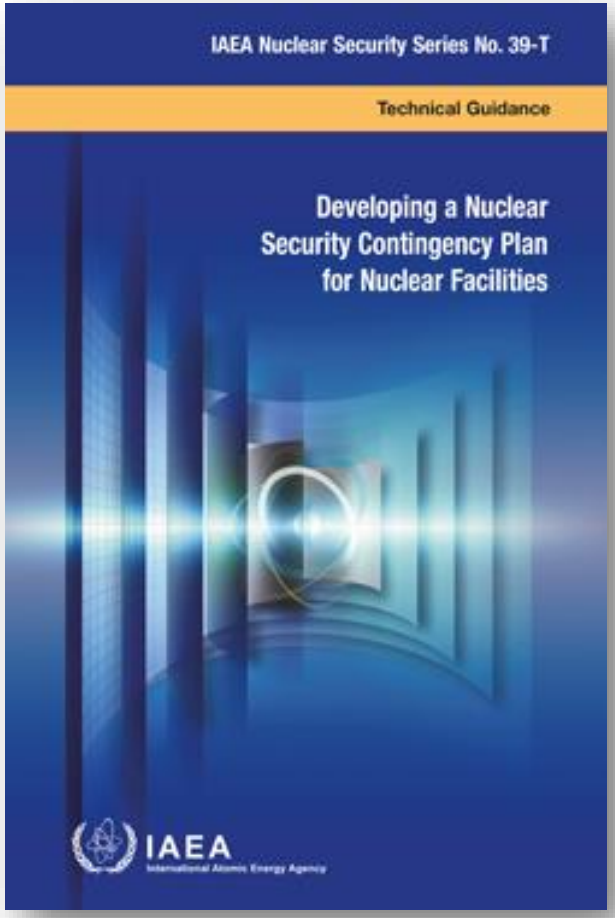
- Armed attack
- Civil disturbance or protest
- Insider actions
- Secure area intrusion
- Suspected theft of nuclear material
- Bomb threat

Contingency Plan Exercises and Evaluations

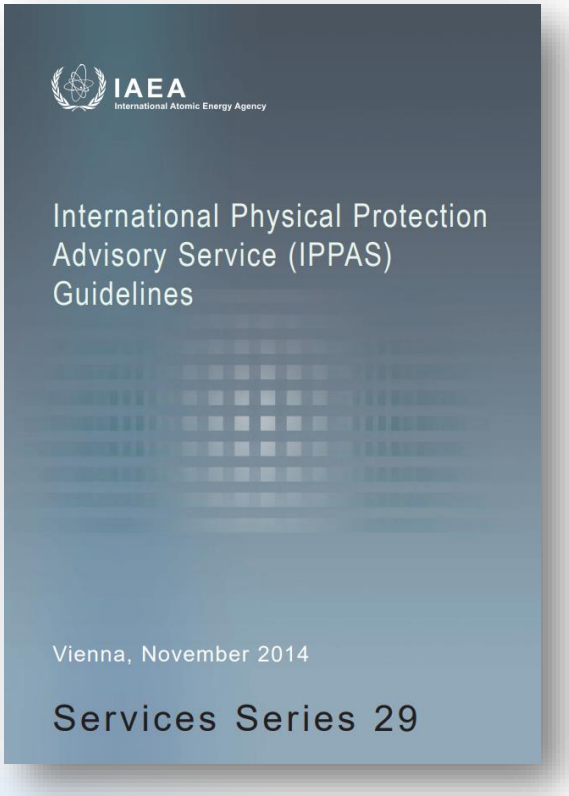
- Contingency response exercises and performance evaluations are an important element of the nuclear security regime
  - Facility-level exercises (e.g., force-on-force exercises at certain facilities)
  - Joint security exercises with off-site response organizations

Credit: O.Bukharin, IAEA

Question and Answer



Overview of International Physical Protection Advisory Service (IPPAS)



Mr. Arvydas Stadalnikas

Unit Head of Integrated Nuclear Security Approaches Unit, Nuclear Security of Materials and Facilities Section, Division of Nuclear Security, IAEA

History of International Physical Protection Advisory Service (IPPAS)

- Board of Governors in 1995 requested secretariat to provide advisory service to assist States, upon request, with an appraisal of their national systems for physical protection
- IPPAS is not an inspection
- First IPPAS mission was conducted in 1996
- INFCIRC/225/ Rev.3 was used as basis for recommendations

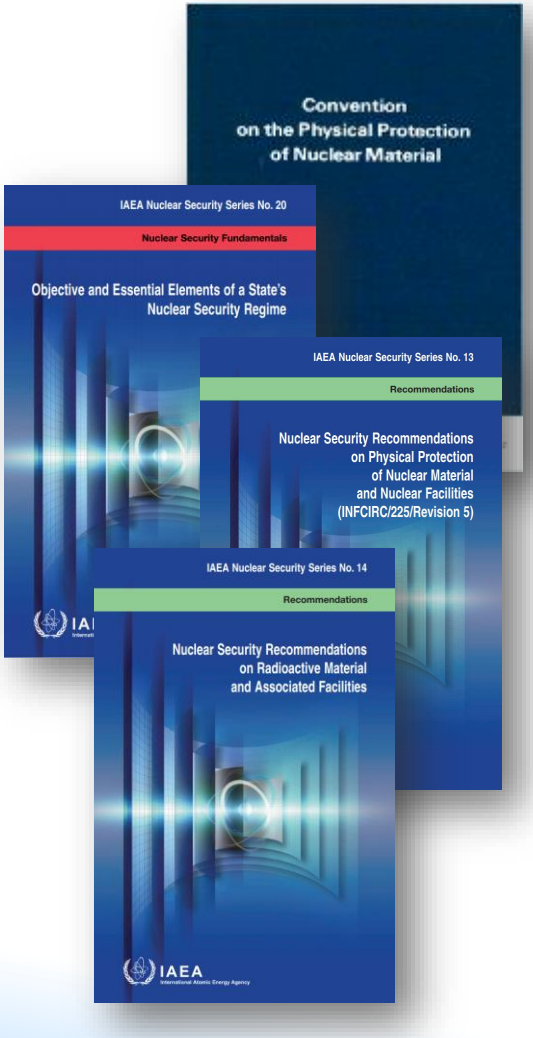
Evolution of IPPAS

- First IPPAS Guidelines published in 1999, review in November 2012, new IPPAS Guidelines were published in 2014.
- Development of material and conduct of pilot IPPAS workshops in 2012
- Up to now, 91 IPPAS missions conducted in 55 Member States (IAEA Laboratories in Seibersdorf)

IPPAS Mission Objectives

- Review State Physical Protection Regime and Security Systems for Nuclear and other radioactive material & associated facilities and activities against international legal instruments and IAEA Nuclear Security Series (NSS)
- Assist Member States and operators to implement requirements and recommendations from international instruments and IAEA NSS publications
- Identify good practices that could be (anonymously) communicated to other Member States for long-term improvement

Basis for the Peer Review



For Recommendations:

- The CPPNM & its 2005 Amendment
- CoC on Safety and Security of Radioactive Sources
- NSS No. 20 - Nuclear Security Fundamentals
- Nuclear Security Recommendations
  - NSS No.13 - Physical protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev.5)
  - NSS No.14 - Security of Radioactive Material and Associated facilities

For Suggestions:

- IAEA Nuclear Security Series Implementing Guides and Technical Guidance relevant for material and facilities under regulatory control

IPPAS Guidelines

IPPAS guidelines consist of:

- **General Part**
- **Module 1**: National Review of Nuclear Security Regime for Nuclear Material and Nuclear Facilities
- **Module 2**: Nuclear Facility Review
- **Module 3**: Transport Review (for nuclear Material)
- **Module 4**: Review of Security of Radioactive Material, Associated Facilities and associated Activities
- **Module 5**: Information and Computer Security Review

In-draft:

- **Module 6**: Nuclear Material Accounting and Control

IPPAS Process

AWARENESS
and Informal Consultations

Formal Request

3-6 months

Preparatory Meeting

4-8 months

IPPAS Mission

1-2 months

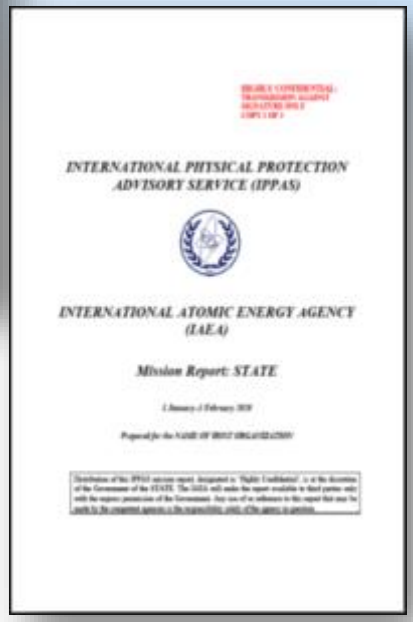
Final Mission Report

6-12 months

Follow-up Activities

3-4 years

IPPAS Follow-up Mission


INTERNATIONAL PHYSICAL PROTECTION ADVISORY SERVICE (IPPAS)

INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

Mission Report: STATE

IPPAS mission report is highly confidential

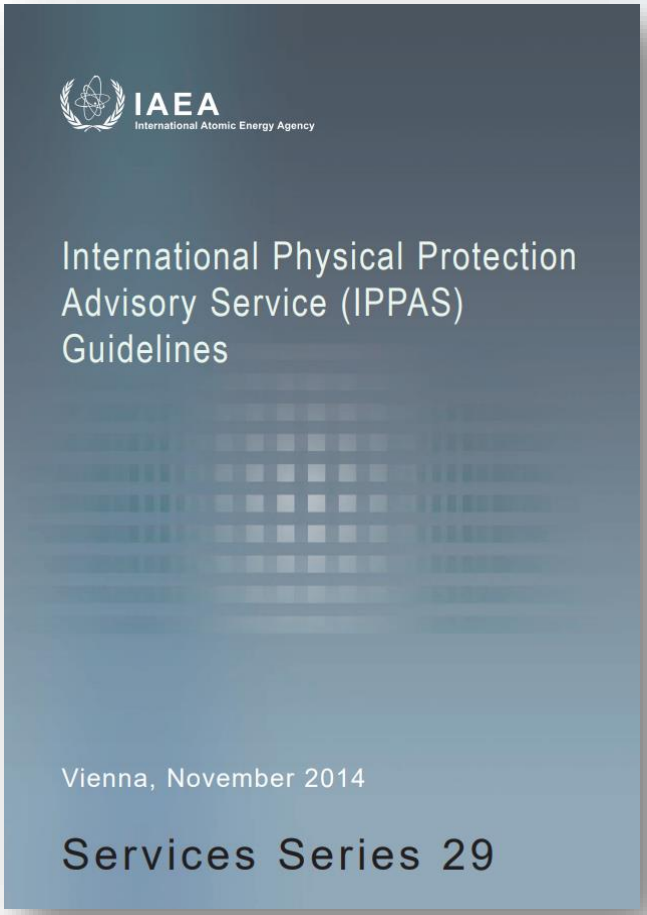
IPPAS Mission: Output/Benefits

- IPPAS report provides:
  - Independent views and recommendations by international team of experts
  - Advice, which establishes solid basis for further enhancement of the national nuclear security regime
- Exchange of international experience
- Broadening knowledge
- International recognition of good practices

IPPAS Follow-up Activities

- Assistance provided, upon request of the host country, on the basis of the recommendations and suggestions of the IPPAS mission
- Necessary additional advice
- Legislative and regulatory assistance
- Training for regulators and operators
- DBT methodology
- Methodology on self-assessment of nuclear security culture
- Equipment for upgrades
- … other areas for cooperation

Question and Answer

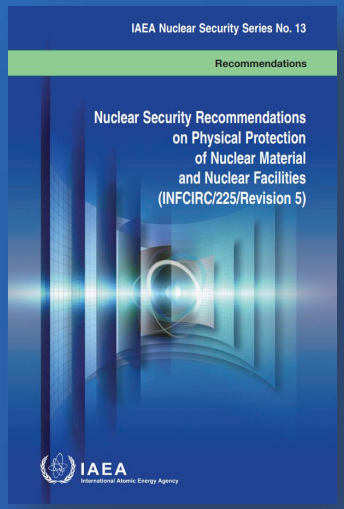


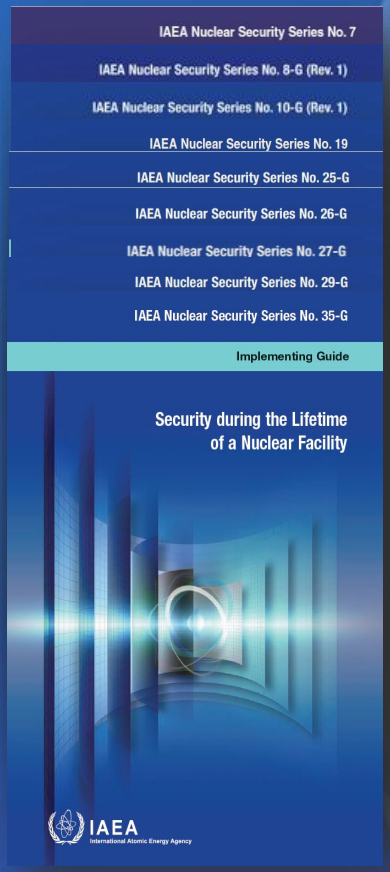
Webinar Conclusions

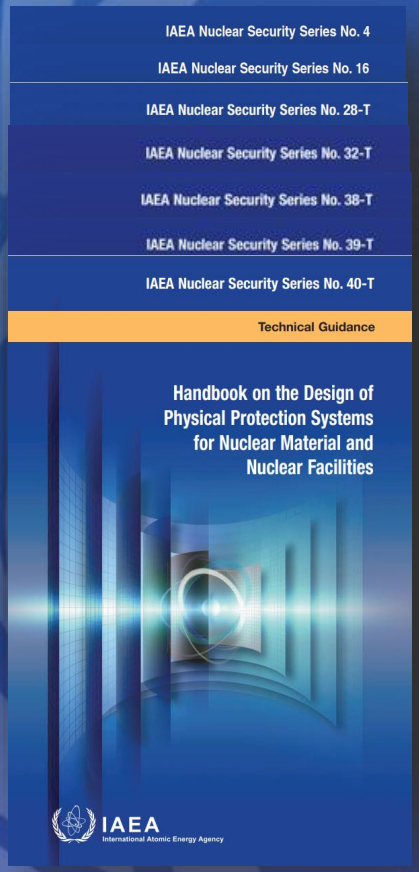
- NSS No. 13 (INFCIRC 225/Rev. 5) provides recommendations for the development of a physical protection regime, that adheres to the CPPNM and Its Amendment
- NSS No. 26-G is the implementing guide for NSS No. 13, with regard to **transport**
- NSS No. 27-G is the implementing guide for NSS No. 13, with regard to **use and storage**
- The remaining publications discussed provide more detailed guidance pertaining to specific thematic areas, and their related fundamental principles
- Although not all 12 of the fundamental principles were individually correlated to a publication, each one plays an important role in the development, implementation, and maintenance of a robust physical protection regime

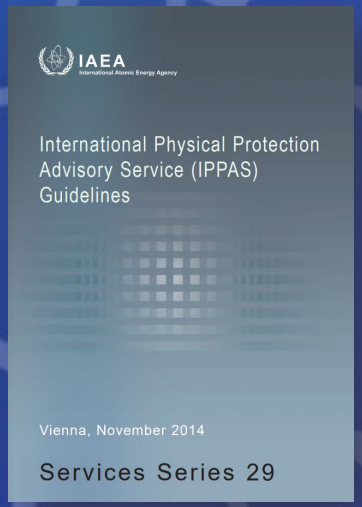
IAEA
International Atomic Energy Agency
Atoms for Peace and Development

Final Question and Answer









One-Question Survey

Please go to www.menti.com


Thank you for your participation!