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Joint ICTP-IAEA School of Nuclear Energy Management

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**Establishing National Nuclear Security Infrastructure
(Module 9 Topics 3 & 4)**

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Establishing National Nuclear Security Infrastructure (Module 9 Topics 3 &4)

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Management
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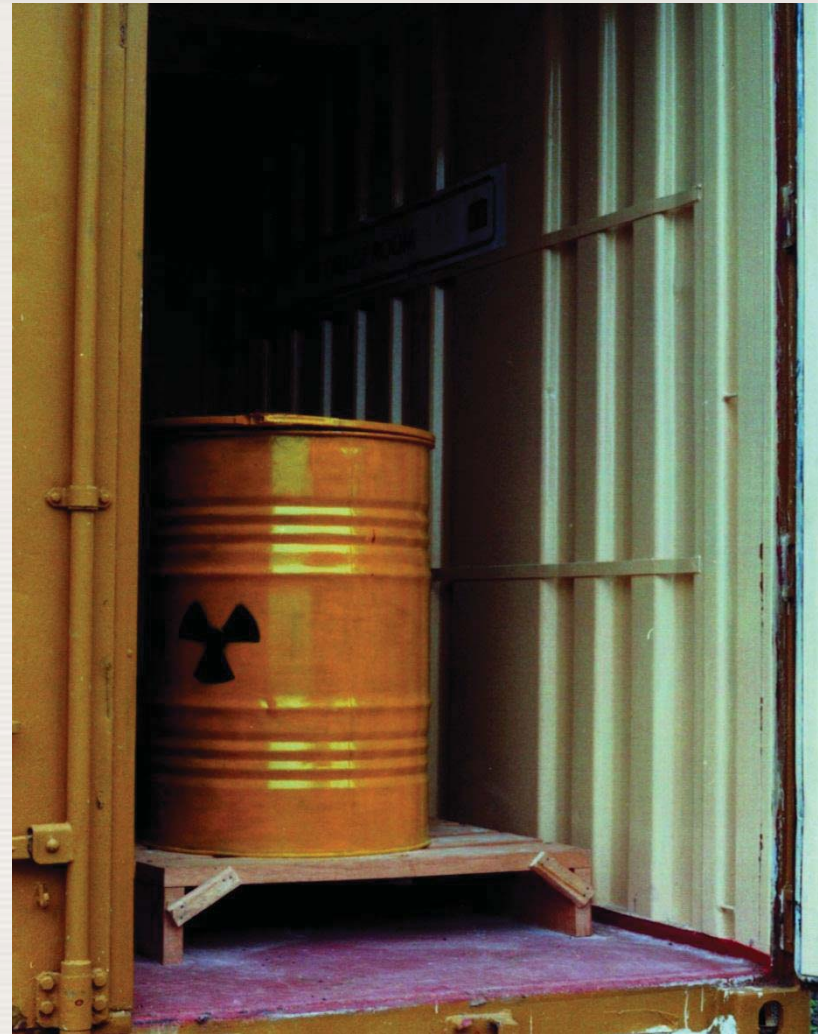
Contents

- What is nuclear security?
- What is the international legal foundation of nuclear security?
- What are the key IAEA Recommendations on Nuclear Security?
- What is nuclear security infrastructure of a State?
- What are some key concepts in nuclear security
 - Safety/Security Interface Trustworthiness
 - Nuclear security event Protection of sensitive information
 - Nuclear Security Culture Nuclear Forensics
 - Threat and Risk Assessment
 - National Response Plan

Context

The possibility that nuclear or other radioactive material could be used for malicious purposes is real.

A global threat demands a global response.



Understanding the threat and risk



What is the threat?

criminals or terrorists acquiring and using for malicious purposes:

- Nuclear weapons
- Nuclear material to make IND
- Radioactive material for Radioactive Dispersal (RDD) or Exposure Device (RED)
- Sabotage of nuclear installations or transport

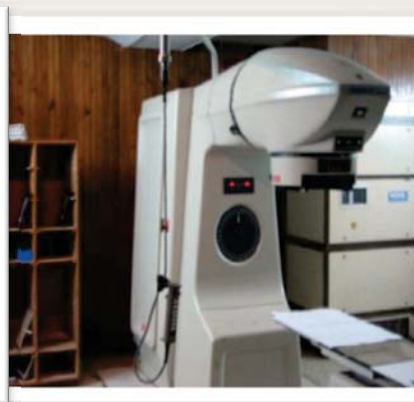
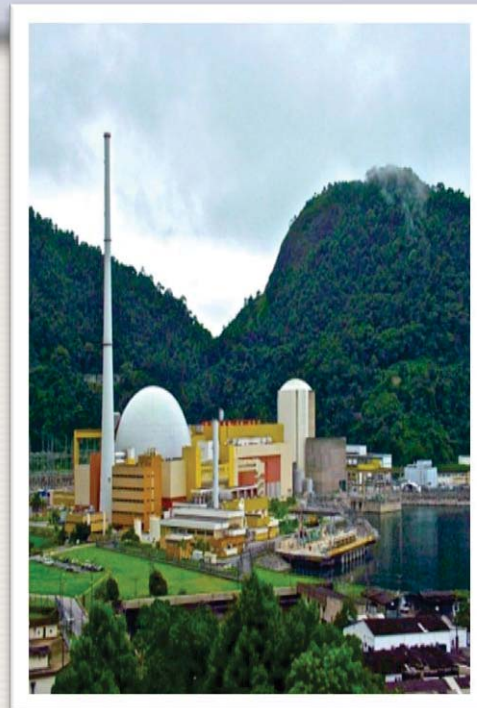
Who poses the biggest risk?

- The States that does not recognize the threat of nuclear terrorism
- The State that does not take preventive action
- The State that is complacent



Potential Targets in Figures

- > 25.000 nuclear weapons
- > 3.000 tons civil and military HEU and Pu
- > 480 research reactors (> 100 with HEU)
- > 100 fuel cycle facilities
- > 430 operating nuclear power plants
- > 100.000 Cat I and II radioactive sources
- > 1.000.000 Cat III radioactive sources



Nuclear Security



Prevention



Detection



Response

... to theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities.

THE RESPONSIBILITY FOR THE ESTABLISHMENT, IMPLEMENTATION AND MAINTENANCE OF A NUCLEAR SECURITY REGIME WITHIN A STATE RESTS ENTIRELY WITH THAT STATE

Introduction to Key International Legal Instruments for Nuclear Security- binding

Conventions & Treaties

- Convention on the Physical Protection of Nuclear Material (1987)
- Amendment to the Convention on the Physical Protection of Nuclear Material (2005)
- International Convention on the Suppression of Acts of Nuclear Terrorism (2005)
- International Convention for the Suppression of Terrorist Bombings (1997)
- International Convention for the Suppression of Financing of Terrorism (1999)
- Others related to unlawful acts against aviation and maritime



United Nations Security Council Resolutions made under Part VII of the UN Charter

- UNSCR 1540 – obliges States to refrain from supporting by any means non-State actors from developing, acquiring, manufacturing, possessing, transporting, transferring or using nuclear chemical or biological weapons and their delivery systems (Weapons of mass destruction)
- UNSCR 1373 – on international cooperation to combat threats to international peace and security caused by terrorist acts in particular the financing of terrorism

Introduction to Key International Legal Instruments for Nuclear Security- non binding

IAEA Codes of Conduct represent the political will of States to be bound and are not legally binding at international law. They may however be adopted into national legislation that would then make them binding within the State

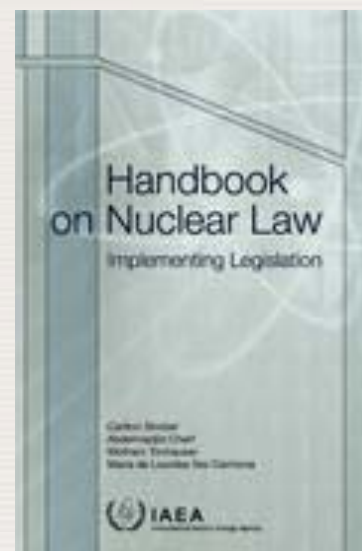
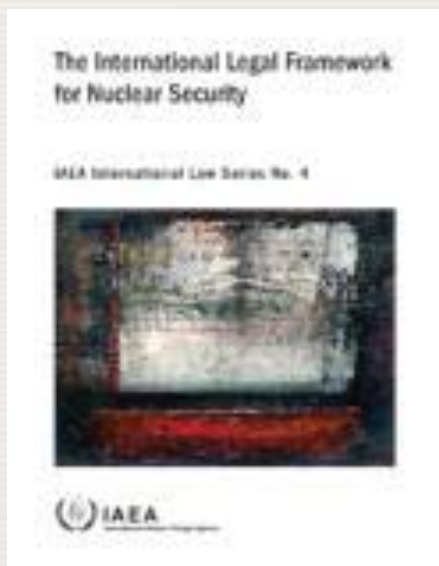
IAEA Codes of Conduct

- Code of Conduct on the Safety and Security of Radioactive Sources
- Supplementary Guidance on Import and Export
- Guidelines for transfers of nuclear-related dual-use equipment, material and related technology (INFCIRC 254/Rev 6/Part 1);

International Law implementation in the State

Guidance on implementing nuclear security measures in establishing a national nuclear security infrastructure:

- IAEA International Law Series No 4;
- The IAEA Handbooks on Nuclear Law.
- IAEA Nuclear Security Series.



IAEA Nuclear Security Series

Assists a State implement obligations contained in international legal instruments relevant to nuclear security:

- **Fundamentals (PRINCIPLES)**
 - Objectives and principles
 - Basis for Nuclear Security Recommendations
 - Essentials from international instruments
- **Recommendations (WHAT)**
 - General approaches, actions, concepts and strategies
 - Applications of Fundamentals
- **Implementing Guides (HOW)**
 - Broad guides on how Recommendations to be applied
 - Ways and means for how Recommendations implemented at systems level
- **Technical Guidance**
 - Reference Manuals, Training Guides, Service Guides

18 publications
so far



<http://www-pub.iaea.org/MTCD/publications>

IAEA Nuclear Security Series

Assistance for a State to implement obligations contained in international legal instruments relevant to nuclear security:

- **Nuclear Security Fundamentals**
- Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities
- Nuclear Security Recommendations on Radioactive Material and Associated Activities and Facilities
- Nuclear Security Recommendations on nuclear and other radioactive material out of regulatory control

**18 publications
so far**



<http://www-pub.iaea.org/MTCD/publications>

IAEA Nuclear Security Guidance

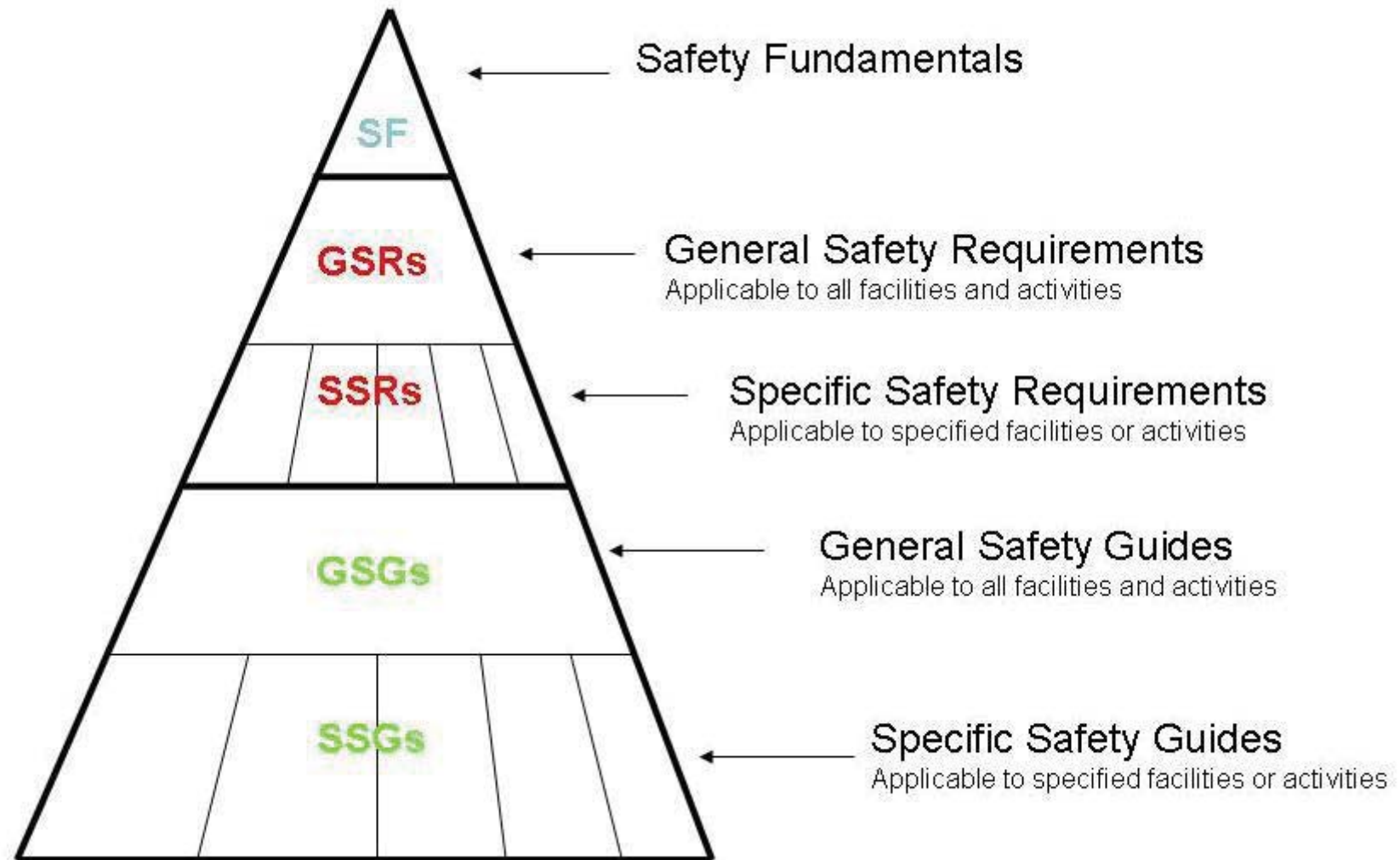
- The IAEA Nuclear Security Guidance Series provides a system for encouraging States achieve high levels of nuclear security. They reflect international consensus on key aspects of nuclear security with the ultimate objective of protecting people, society and the environment. The IAEA nuclear security guidance is applicable to both material and facilities under regulatory control as well as material out of regulatory control.

Safety/Security Interface

- Both safety and security have the same objective: protect people and the environment.
- Safety and security both rely on international and national legal frameworks for implementation.
- Responsibilities for safety and security may be assigned to the same competent authority in relation to licensing issues, however a larger number of competent authorities are involved in nuclear security, and include agencies such as customs, border protection, national security apparatus, law enforcement agencies.
- The requirements of safety and security must be recognized and well managed in relation to all uses of nuclear energy.
- Safeguards must also be managed and this concept has been referred to as 3 S – however this presentation does not deal in detail with the 3S concept. Safeguards has as its primary objective the prevention of the spread of nuclear weapons by States (proliferation).



IAEA Safety Series



IAEA Safety Standards

- The IAEA safety standards provide a system for ensuring safety. They reflect an international consensus on what constitutes a high level of safety for protecting people and the environment from harmful effects of ionizing radiation. The IAEA safety standards are applicable throughout the entire lifetime of facilities and activities – existing and new – utilized for peaceful purposes, and to protective actions to reduce existing radiation risks.

Nuclear Security Infrastructure

- A State undertaking or proposing to undertake activities with nuclear material and other radioactive material, associated facilities and associated activities must establish or improve its nuclear security infrastructure.
- A State must address nuclear and other radioactive material and associated activities and facilities that are under regulatory control as well as nuclear and other radioactive material that becomes out of regulatory control
- Effective nuclear security infrastructure should ensure protection of people, society and the environment from any adverse consequence that may arise from a nuclear security event.



Establishing Nuclear Security Infrastructure in a State- Key topics

National Nuclear Security Policy and Strategy

Legal and Regulatory Framework

Common Nuclear Security Measures for an Effective
Nuclear Security Infrastructure

Nuclear Security Measures for Nuclear Material and
Nuclear Facilities

Nuclear Security Measures for Radioactive Material,
Associated Facilities and Activities

Nuclear Security Measures for Nuclear and Other
Radioactive Material out of Regulatory Control

International Cooperation and Assistance



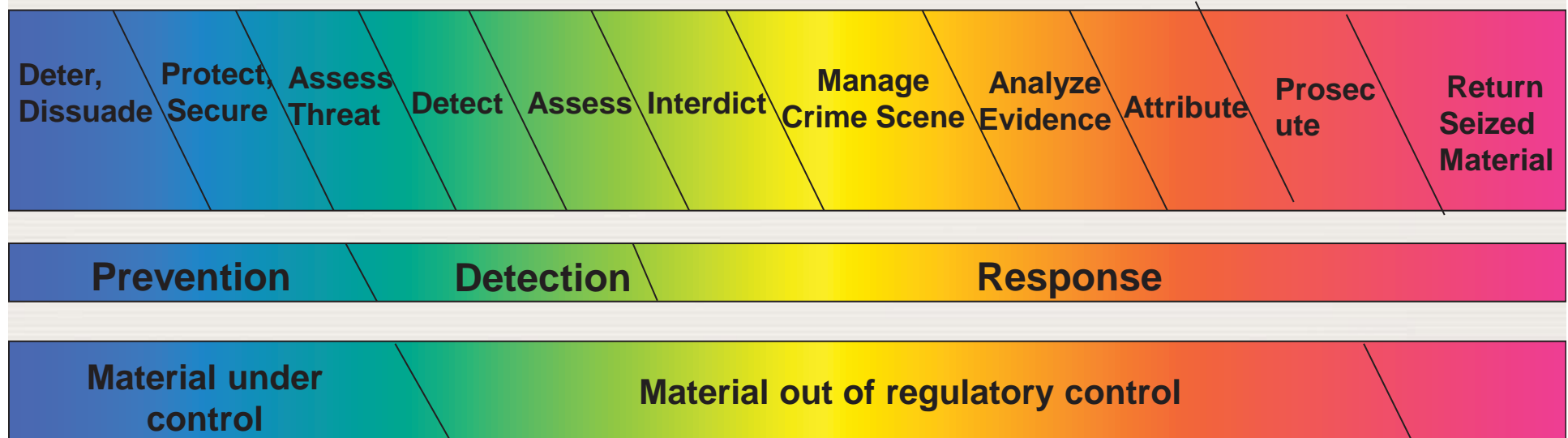


IAEA

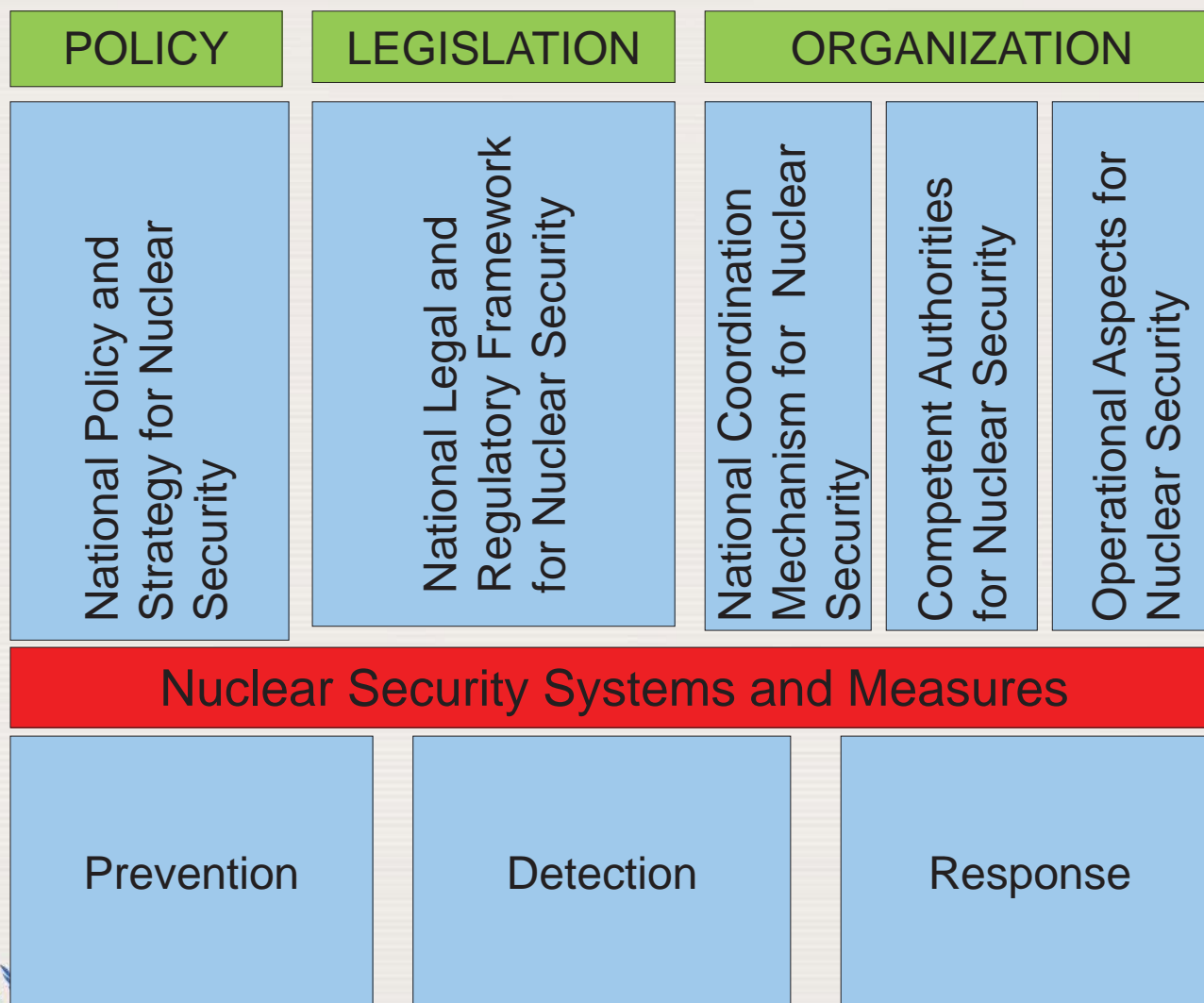
Nuclear Security Coordination within a State



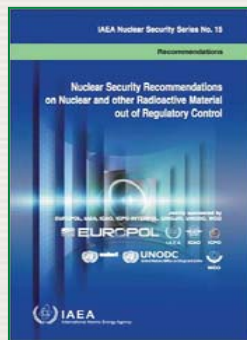
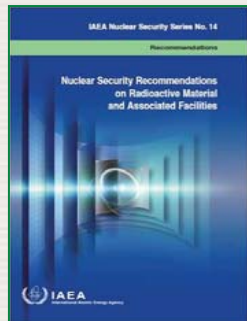
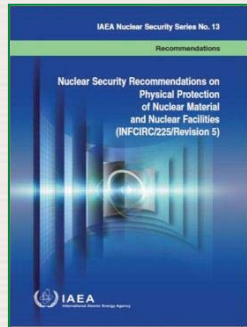
Nuclear Security Spectrum



National Nuclear Security Infrastructure



Nuclear Security Infrastructure



National Nuclear Security Policy and Strategy



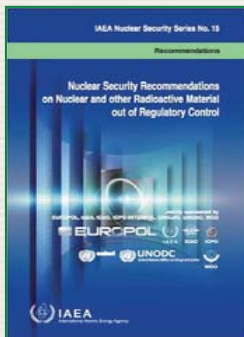
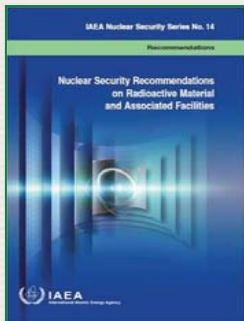
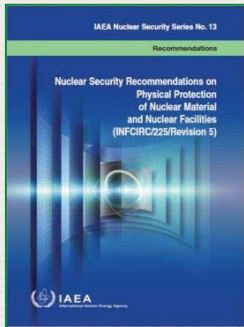
The national policy and strategy for nuclear security should be based on the State's overarching national security policy and should identify all competent authorities that have a role in nuclear security infrastructure. It should establish coordinating mechanism among competent authorities and establish the policy for bilateral, regional and international cooperation and assistance.

Nuclear Security Infrastructure

Legal and Regulatory Framework

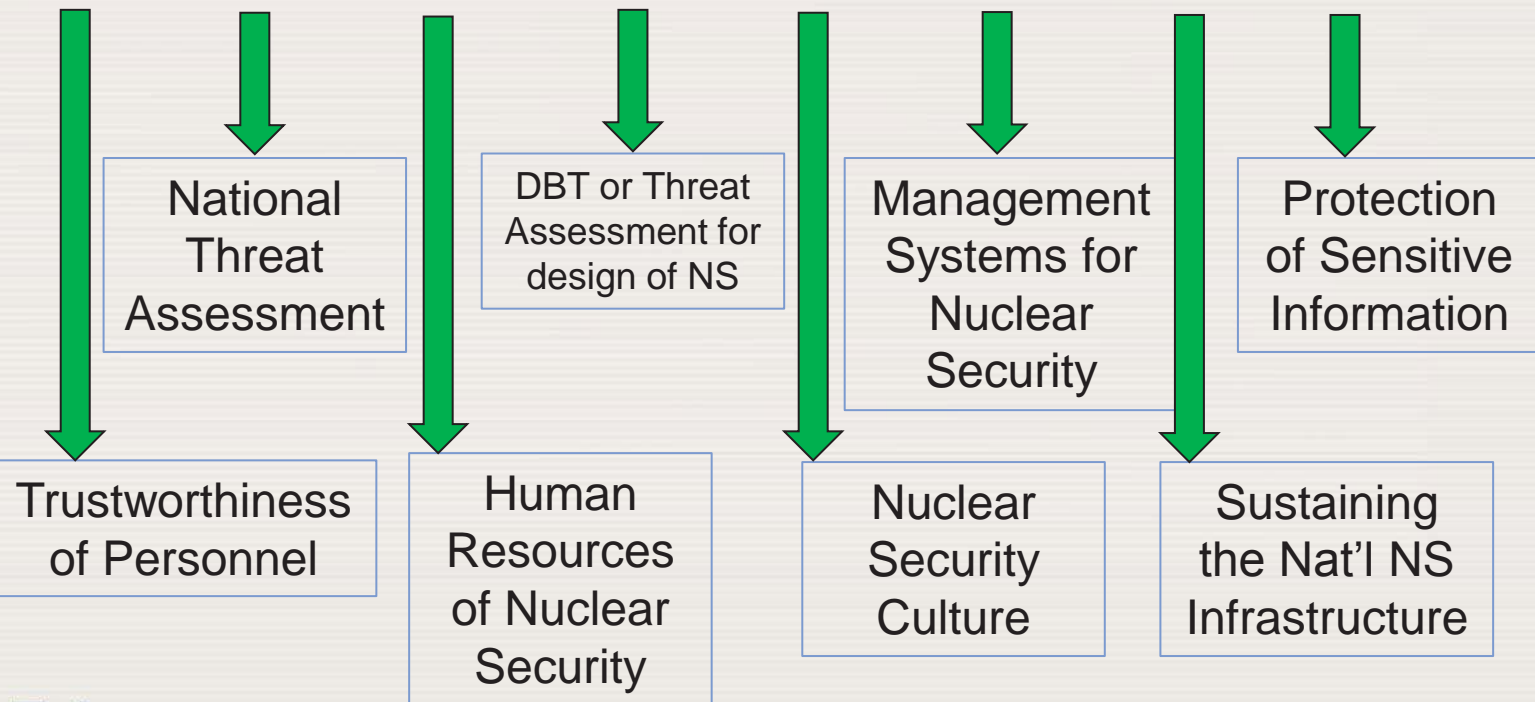
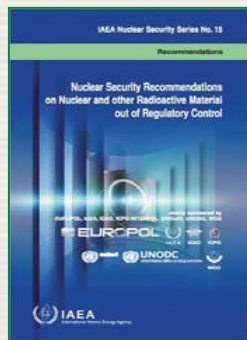
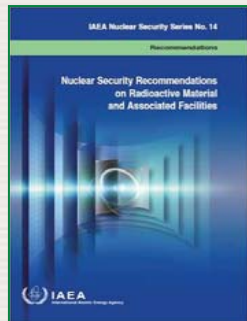
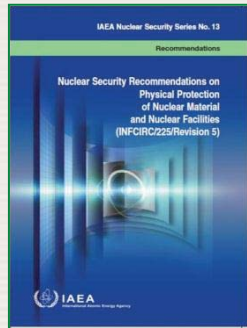


- **States should become parties to all relevant international legal instruments and be aware of obligations imposed by binding UNSC Resolutions**
- **Legal framework should establish the functions and powers (roles and responsibilities) of all competent authorities involved in nuclear security .**



Nuclear Security Infrastructure

Common Nuclear Security Measures for an Effective Nuclear Security Infrastructure

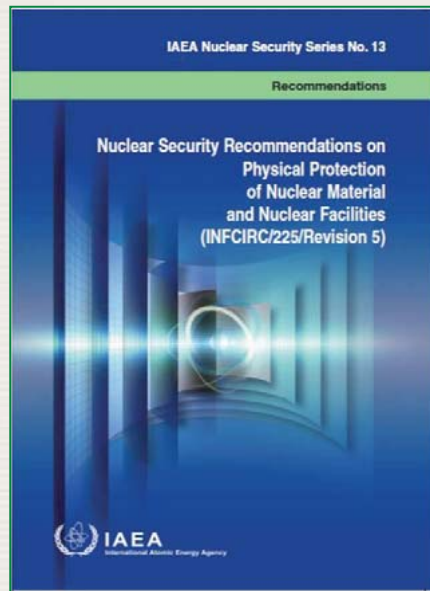


Other key Nuclear Security Topics

- **Management Systems for Nuclear Security**
- **Nuclear Security Culture**
- **Threat and Risk Assessment**
- **Cyber Threat**
- **Trustworthiness of Personnel**
- **Protection of sensitive information and information assets**
- **Radiological Crime Scene Management**
- **Nuclear Forensics in Support of Investigations**
- **National Nuclear Forensic Libraries**
- **These are covered in key Nuclear Security Series Guidance documents either published or under development as part of the Series [<http://www-ns.iaea.org/security/nss-publications>]**



Nuclear Security Infrastructure



Nuclear Security Measures for Nuclear Material and Nuclear Facilities



Measures against
unauthorized removal
of nuclear material in
use and storage and
sabotage of nuclear
facilities



Measures against
unauthorized removal
of nuclear material and
sabotage of nuclear
material during
transport

Recommendations in NSS No 13

Nuclear Security Series No.13

- **The objective of implementation of nuclear security systems and measures for nuclear material and nuclear facilities is**
 - **To protect against unauthorized removal of nuclear material**
 - **In the event of unauthorized removal to locate and recover that material**
 - **To protect nuclear material and nuclear facilities against sabotage**
 - **In the event of an act or acts of sabotage against NM or NF to mitigate or minimize the radiological consequences of sabotage**

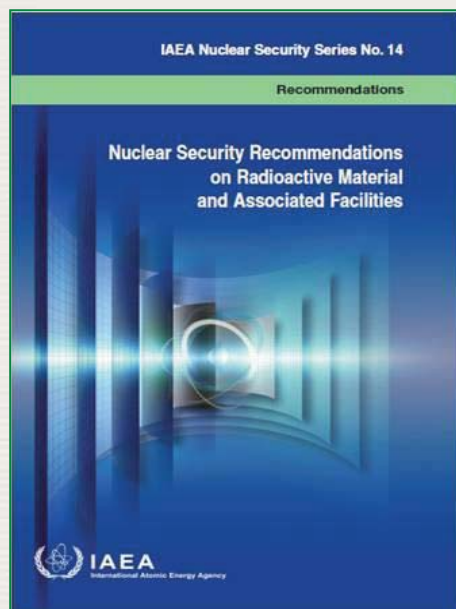
The objective can be achieved through

- **Nuclear security systems and measures (physical protection measures) that apply to nuclear facilities and to nuclear material when in use storage or transport**



Nuclear Security Infrastructure

Nuclear Security Measures for Radioactive Material and Associated Facilities



Recommendations in
NSS No 14



General

Security of
radioactive
material in
use and
storage

Security of
radioactive
material in
transport

Measures to prevent theft or unauthorized removal of other radioactive material and to prevent the sabotage of material, associated facilities and activities.

Nuclear Security Series No.14

- **The objective of implementation of nuclear security systems and measures for radioactive material, associated facilities and associated activities is to:**
 - **Deter, detect and delay unauthorized access to or removal of radioactive material**
 - **Allow rapid response to any nuclear security event to enable appropriate response to allow recovery of RM and mitigation of the consequences of the event as soon as possible**
 - **Provide for rapid response to any attempted or actual unauthorized access to radioactive material**

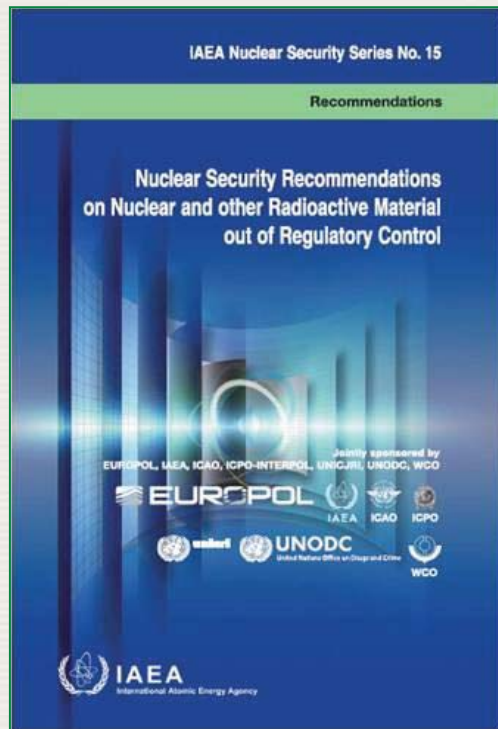
The objective can be achieved through

- **A graded approach to nuclear security systems and measures relevant to the threat and relative attractiveness of material for unauthorized use.**



Nuclear Security Infrastructure

Nuclear security measures
for nuclear and other
radioactive material out of
regulatory control



Recommendations in NSS
No 15

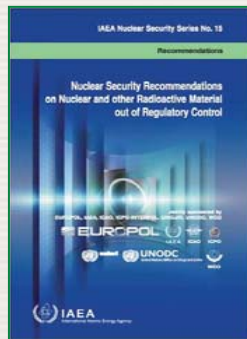
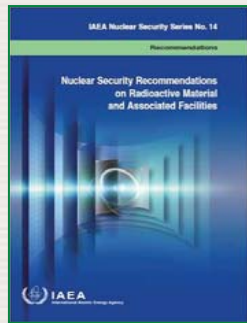
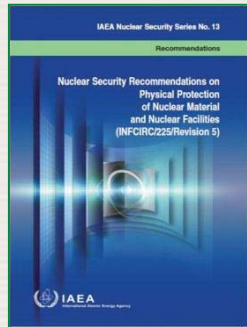


*Measures to prevent,
detect and respond to
criminal or unauthorized
acts with nuclear security
implications involving
nuclear or other
radioactive material out
of regulatory control.*

Nuclear Security Series No.15

- The objective of implementation of nuclear security systems and measures for nuclear and other radioactive material out of regulatory control is to:
 - Prevent, detect and respond to a nuclear security event
 - Prevention measures include criminalization of acts as well as protection of sensitive information, trustworthiness checks and promotion of robust nuclear security culture
 - Detection measures include detection by instrument alarm as well as information alerts
 - Response to a nuclear security event may include the need for radiological crime scene management and the support of nuclear forensics (a discipline of forensic science) to support an investigation and eventual prosecution of a criminal offence (where under criminal or penal code of terrorism

Nuclear Security Infrastructure



International Cooperation and Assistance

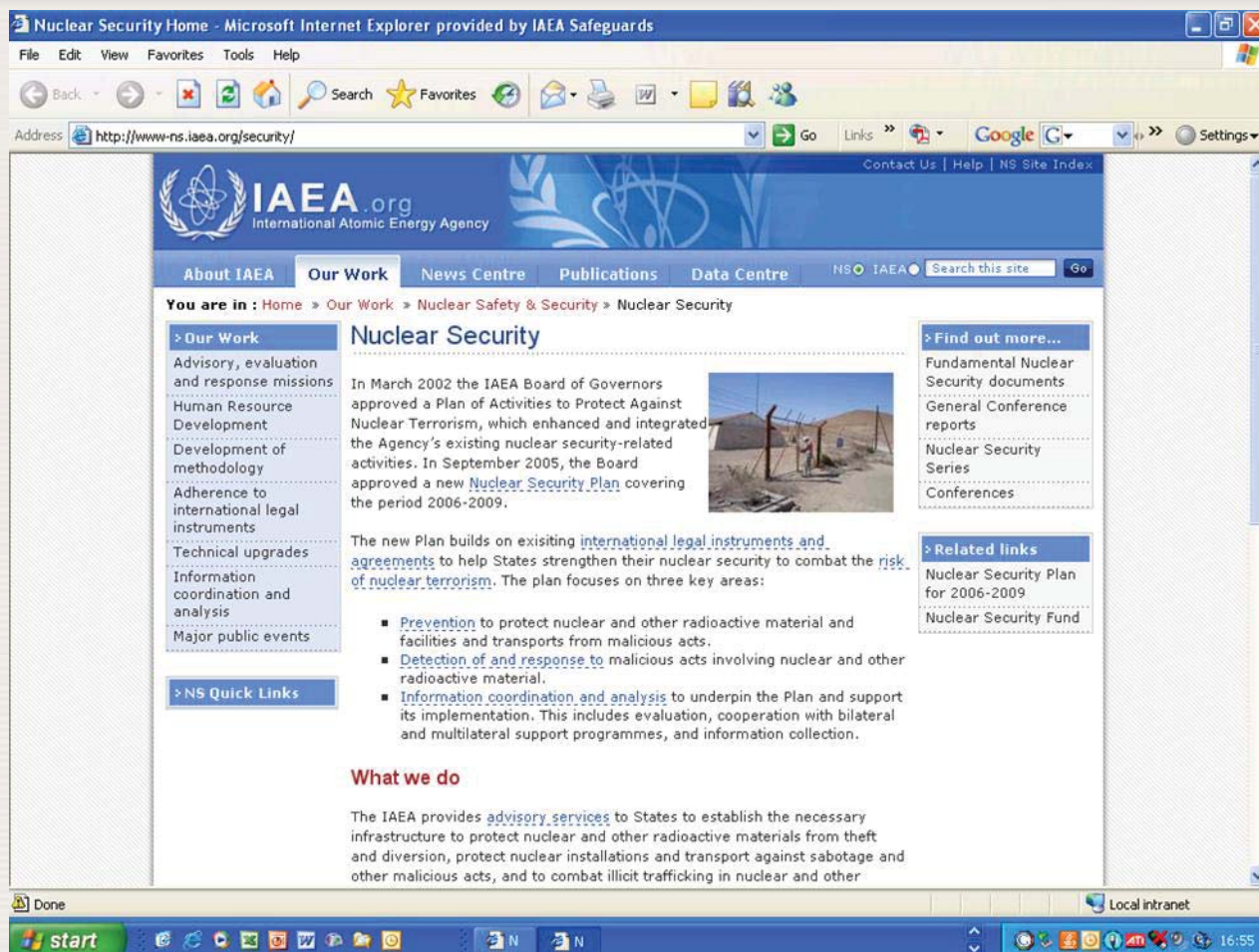


- The global implications of a nuclear security event underlines the importance of international cooperation and assistance
- Cooperation and assistance includes notification of nuclear security events, exchange of information, recovery and return of seized items and technical cooperation and assistance including in relation to nuclear forensics in support of investigations .

Conclusion

- National nuclear security infrastructure is part of a global framework and is underpinned by key international legal instruments that relate to nuclear security.
- Each State is responsible for establishing, implementing and sustaining its national nuclear security infrastructure
- Nuclear security infrastructure needs to be based on an appropriate legal framework with clearly defined roles and responsibilities for all the competent authorities that have responsibility for nuclear security within a State, including the regulatory authority.
- The IAEA publishes key guidance on these important topics within nuclear security to support adherence to key international legal obligations and encourage best international practice in nuclear security among States.

For further information please visit the website:



Website: <http://www-ns.iaea.org/security>
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