

SYNERGY BETWEEN SAFEGUARDS AND NUCLEAR SECURITY

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*Atoms for Peace: The First Half Century
1957-2007*

INTRODUCTION

Definition of Synergy

- From Greek sunergia, meaning “cooperation” and also sunergos, meaning “working together”
- “Is the combined working together of two or more parts of a system so that the combined effect is greater than the sum of the efforts of the parts.”

ONE OBLIGATION (At least one)

UN resolution 1540

All States shall take and enforce effective measures to establish domestic controls to prevent the proliferation of nuclear, chemical, or biological weapons and their means of delivery, including by establishing appropriate controls over related materials

TWO SYSTEMS

- Safeguards (NMAC, but not only)
- Security

- With differences
- But also with synergies

OBJECTIVES

INFCIRC 153 corr

Safeguards are applied on all source or special fissionable material in all peaceful nuclear activities within the territory of State, under its jurisdiction or carried out under its control anywhere (...).

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.

INFCIRC 225 rev 4

The objectives of the State's physical protection system should be:

To establish conditions which would minimize the possibilities for unauthorized removal of nuclear material and/or for sabotage

To provide information and technical assistance in support of rapid and comprehensive measures by the State to locate and recover missing nuclear material and to cooperate with safety authorities in minimizing the radiological consequences of sabotage.



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COMMON GOALS

- Deterring and detecting unauthorized removal of nuclear material
- Provide assurance that all nuclear material is accounted for
- Provide timely detection of a material loss or diversion
- Determine the amount and location of any loss

COMMON ORGANIZATION

Integration of management or organizations at the **facility level** through:

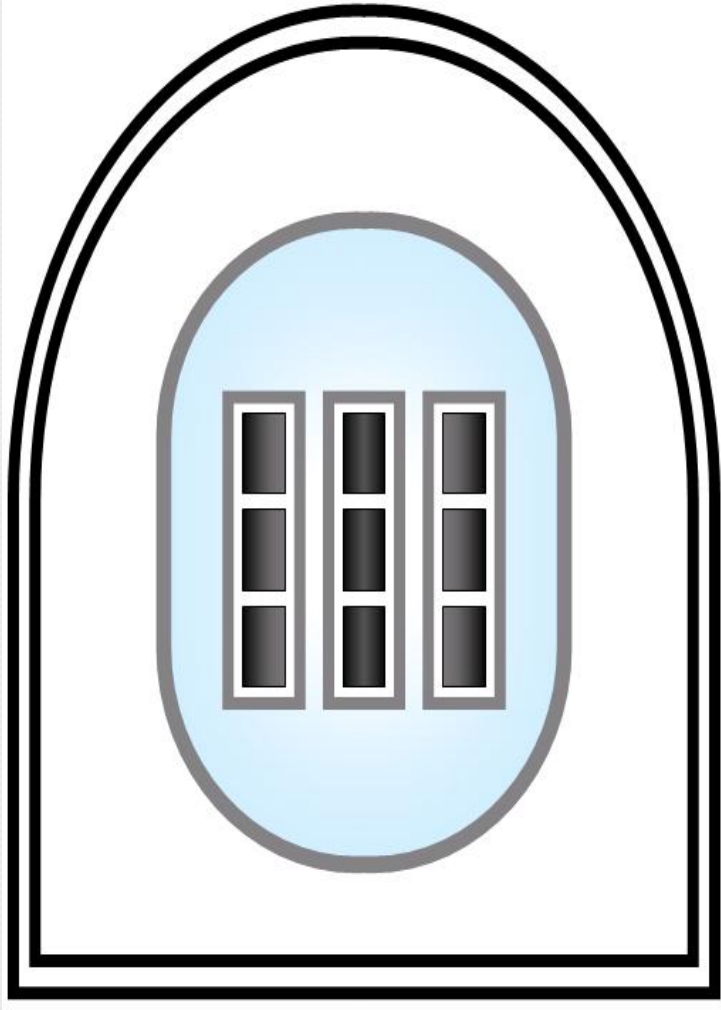
- PPS and NMA&C plans and procedures governing the interaction of personnel during normal or routine and emergency situations
- Integrated risk assessment
- Integrated performance assessments and audits
- Consistent training programs

COMMON ORGANIZATION

Integration of management or organizations at the **state level** through:

- Nuclear law
- Independent responsible empowered authority
- Reporting system (within and outside the State)
- Inspections

COMMON FACILITY



- The nuclear material is used to generate electricity. **Safeguards is required to prevent proliferation by State.**
- **The nuclear reactors are built and operated under specific safety requirements.**
- To prevent sabotage, unauthorized use and possible theft or loss, the **required security measures should be in placed.**



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COMMON FACILITY

Example 1 – Areas and Access Control in nuclear installations

- Protection and identification of areas of importance
 - Safety, security and safeguards improvements through
 - ❖ physical separation/redundancy of system design
 - ❖ strengthening existing protection of safety systems
 - ❖ early identification of containment and surveillance envelop
- Access to systems, buildings and locations
 - Easy access for maintenance/testing and nuclear material accounting vs restrictions for security reasons – close dialogue needed to find the necessary balance

COMMON FACILITY

NMA&C	PPS
NMA&C: <i>Material Balance Area</i>	PPS: controlled areas (e.g., <i>protected or vital</i>)
Control points as input and output flow (KMP) On current material balance (inventory KMP)	Areas surrounded by physical barriers (delay) with intrusion detection systems Access points where all shipments (in and out) can be controlled

MBA flow key measurement points should relate to PPS access control points

MBA boundaries should relate to PPS controlled area boundaries (delay elements)

COMMON FACILITY

Example 2 – Theft of Nuclear Material (Illicit Trafficking)

- Nuclear Material Accountancy
- Storage and protection at the facility
- Security during handling and transport
- Border control
- Illicit Trafficking information sharing and analysis
- Minimize any radiological consequences

COMMON TOOLS

- NDA measurement
- DA
- Containment and surveillance systems
- Nuclear forensics
- Procedures based



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COMMON COMPETENCIES

- Technicians and engineers, but also quality experts, lawyers and managers
- Hard skills but also soft skills (negotiation, observation, communication, analytical...)
- Sustainable State systems: career management, education, continuing training



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COMMON NEEDS

- Scattered authorities and abilities weaken Authority
- Credibility require a “big recognized stick” based on legal, technical and organizational provisions
- Accurate and undisputable nuclear analysis is the basis for further actions
- Effective tracking and follow-ups of events, NM, networks, require up to date relevant databases (ITDB)

COMMON IAEA ACTIVITIES

- ISSAS Missions' teams include one expert from Nuclear Security
- Support to Member States (particularly SSAC Training) is coordinated with Nuclear Security (e.g. EU Joint Action)

COMMON CHALLENGES

- In a context of globalization (free trade zones or export processing zones)
- Facing the threat of terrorism and the risk presented by non-State actors (outsiders and insiders)
- Front end and back end of the Nuclear Fuel Cycle with increasing flow of nuclear material (nuclear renaissance...)
- Non nuclear use of NM (sources containing Pu239, DU shielding containers...)
- Connection between NM smugglers and proliferators of sensitive technologies



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CONCLUSION

Synergies between Security and Safeguards

- Increase the effectiveness and the efficiency in accounting and controlling nuclear material
- Create a better integration of human-factor related considerations at all levels (facility, state, operator, regulator, decision makers...)
- Improve both Security and Safeguards
- Are a step towards 3S