U.S.NRC
United States Nuclear Regulatory Commission
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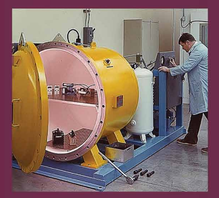
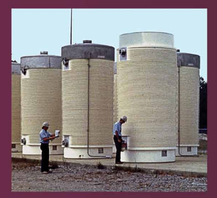
RIC 2013

March 12–14

OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

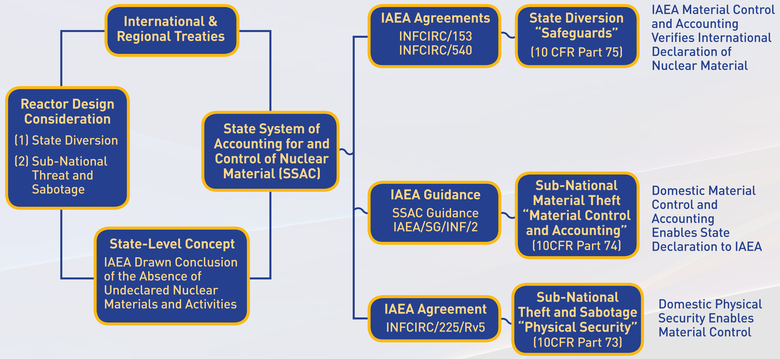
IAEA Safeguards by Design for Nuclear Reactors

What is Safeguards by Design?

"The process through which international safeguards measures are considered throughout all phases of a nuclear facility project to avoid retrofits or redesigns, and to make the implementation of international safeguards more effective and efficient."

Background

Safeguards by Design (SBD) is the process of including the consideration of international safeguards throughout all phases of a nuclear facility project, from the initial conceptual design through facility construction and into operations, upgrades, design modifications, decommissioning, and dismantlement. The "by design" concept encompasses planning and preparing for the implementation of safeguards through all of these stages. SBD does not introduce new requirements; instead, it presents an opportunity to voluntarily engage in safeguards considerations at an early stage to facilitate cost-effective implementation.



Advantages to Stakeholders

- Increase International Marketability
- Reduce Risk to Project Cost and Schedule
- Reduce Operator Burden
- Facilitate Joint-Use Equipment and Data Sharing
- Demonstrate International Leadership

Pre-Conceptual Design

- Designer and operator should work to ensure that the IAEA is aware of the design and can begin SBD engagement
- Initial IAEA evaluation of the operational process and diversion path analysis
- IAEA proposes a safeguards approach and initiates dialogue with stakeholders
- Designer and operator should review project's safeguardability

Conceptual Design

- Confirm design can meet safeguards goals
- Confirm design supports safeguards infrastructure (equipment and activities)
- Repeat diversion path analysis to verify no new paths have been created at this design stage

Preliminary to Final Design

- Review detailed facility design
- Confirm safeguards system meets requirements

Construction

- Review as-built status
- Confirm safeguards system performance

International SBD is:

- A voluntary and collaborative process
- An ongoing dialogue
- A way to increase efficiency and effectiveness of international safeguards

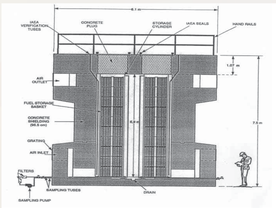
Design Consideration: IAEA CANDU Spent Fuel Monitor

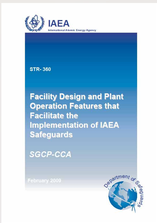
Design Consideration: IAEA Power Monitor

Design Consideration: IAEA Mobile Camera

Design Consideration: IAEA Cabinet Space

Design Consideration: IAEA Sealed Terminal


Design Consideration: IAEA CANDU Spent Fuel Storage



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NNSA National Nuclear Security Administration

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