From 2010 NPT Review Conference Follow-up Actions on Nuclear Non-Proliferation & JAEA's Activities to Improve Safeguards

Panel 1-1
"Strengthening the Effectiveness and Improving the Efficiency of the Safeguards"

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2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons
Final Document

From actions on Nuclear non-proliferation

Safeguards effectiveness and efficiency

Action 32: The Conference recommends that IAEA safeguards should be assessed and evaluated regularly. Decisions adopted by the IAEA policy bodies aimed at further strengthening the effectiveness and improving the efficiency of IAEA safeguards should be supported and implemented.

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Develop/Improve Safeguards

Action 34: The Conference encourages States parties, within the framework of the IAEA statute, to further develop a robust, flexible, adaptive and cost effective international technology base for advanced safeguards through cooperation among Member States and with IAEA.

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Additional Protocol

Action 28: The Conference encourages all States parties which have not yet done so to conclude and to bring into force additional protocols as soon as possible and to implement them provisionally pending their entry into force.

Action 29: The Conference encourages IAEA to further facilitate and assist the States parties in the conclusion and entry into force of comprehensive safeguards agreements and additional protocols. The Conference calls on States parties to consider specific measures that would promote the universalization of the comprehensive safeguards agreements.

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Safeguards for Nuclear Weapon Countries

Action 30: The Conference calls for the wider application of safeguards to peaceful nuclear facilities in the nuclear-weapon States, under the relevant voluntary offer safeguards agreements, in the most economic and practical way possible, taking into account the availability of IAEA resources, and stresses that comprehensive safeguards and additional protocols should be universally applied once the complete elimination of nuclear weapons has been achieved.

Japan/JAEA's Full Compliance with IAEA Safeguards

- 1976: Nuclear Non-Proliferation Treaty
- 1977: Comprehensive Safeguards Agreement
- 1999: Additional Protocol
- 2004: Broader Conclusion ⟹ Integrated Safeguards (IS)
- 2008: Introduction of IS Approach for Plutonium-Handling Facilities (Tokai)
- 2009: IS for Fast Reactor (Monju)
- 2010: IS for Joyo & others (Oarai)

Towards Effective and Efficient Safeguards

Improvement of Safeguards (SG) for Nuclear Fuel Cycle in JAEA

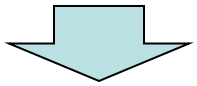
The following consideration is essential to implement SG.

(1) From the viewpoint of the facility operator

- To minimize the impact on plant operation by SG activities
- To minimize operator efforts (manpower, cost, etc.) for the verification activities

(2) From the viewpoint of the inspectorate

- To draw a conclusion of non-diversion by verification activities of declared nuclear materials based on the SG criteria
- To draw a conclusion of absence of undeclared activities and materials
- To draw each conclusion by effective and efficient SG activities



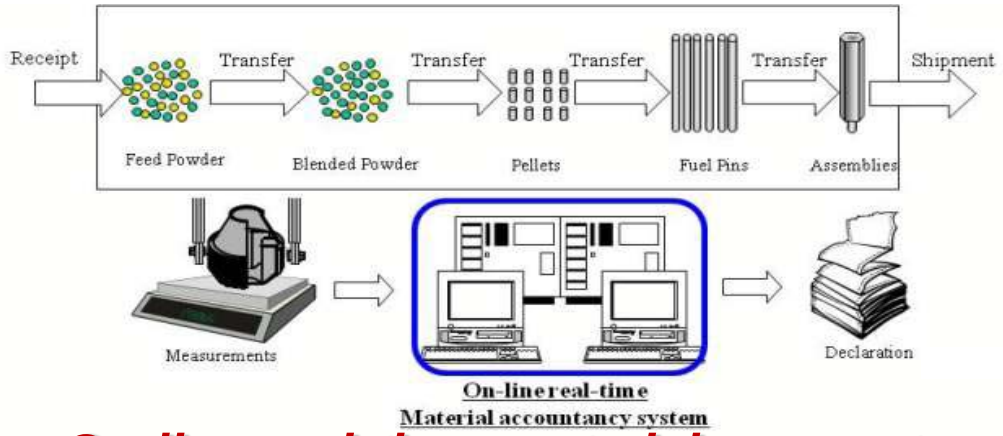
Safeguards by Design (SBD)

Safeguards by Design (SBD), consideration of Safeguards from the early stage of facility design, is one of the essential ideas to realize effective and efficient implementation of safeguards.

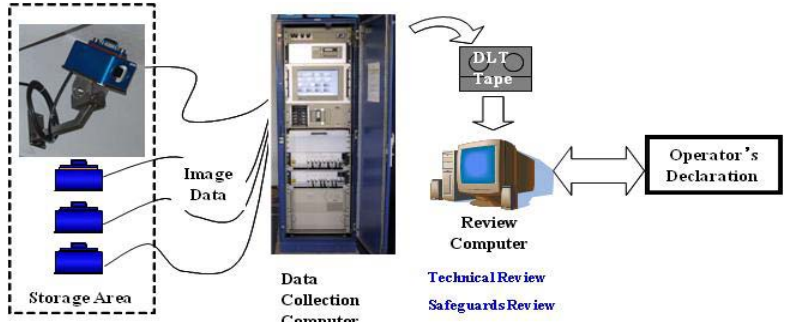
For example, JAEA carried out the SBD for the PFPF from the 1980s.

JAEA J. Ninagawa et al. Experiences and Achievement on Safeguards by Design for the Plutonium Fuel Production Facility (PFPF) IAEA-CN-184/66 (2010 IAEA SG Symposium)

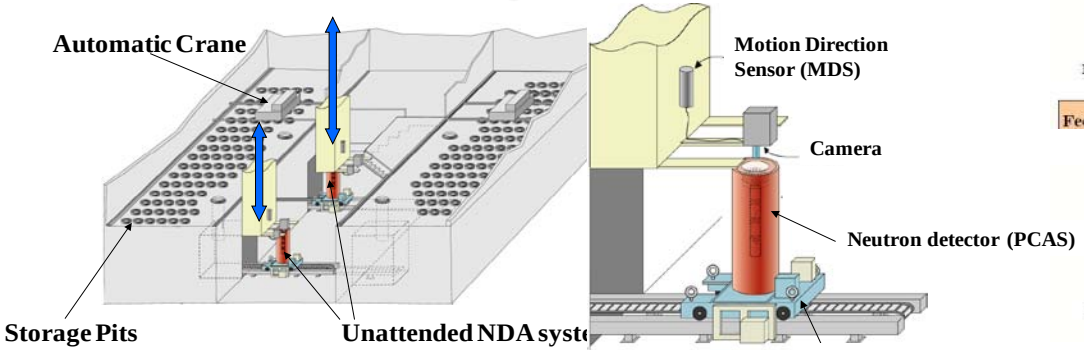
Examples of SBD – Instrumentation for SG



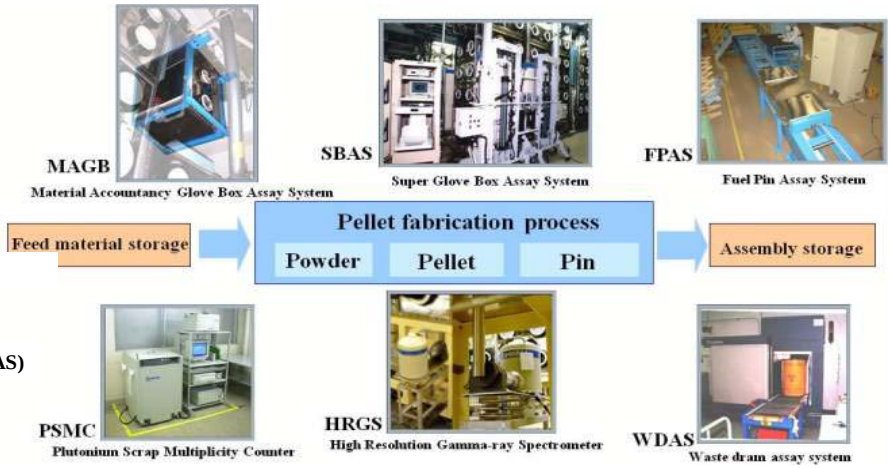
On-line real-time material accountancy system



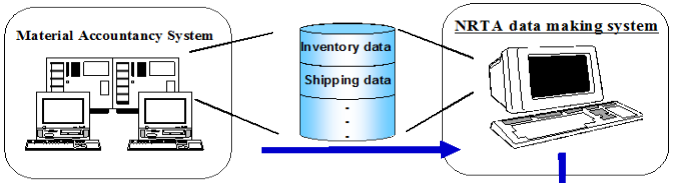
Containment and surveillance system



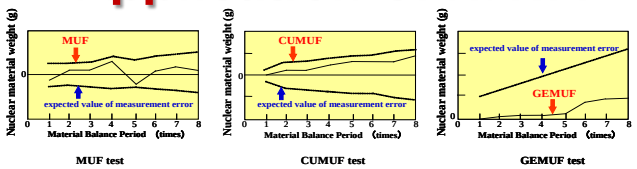
Unattended NDA system



NDA systems for verification of nuclear materials in the fabrication process area



Application of *NRTA*



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The SBD has contributed to the establishment of the Integrated Safeguards (IS) approach for the PFPF.

IS Approach (Plutonium-Handling Areas)

- Random interim inspection
- Remote monitoring system
- Providing facility information more frequently

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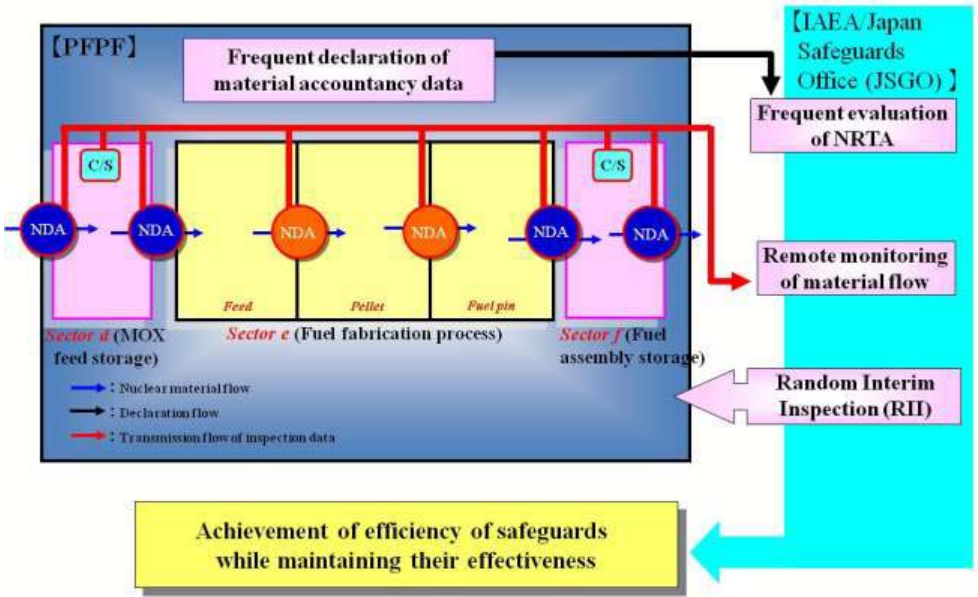
- Human resources for inspection has significantly been decreased (50% reduction expected).
- Does not disturb facility operations



Safeguards Challenges for Future Nuclear Fuel Cycle

- More effective and efficient Safeguards?
- Attain SG goals when scaled-up?
- Need to consider further nuclear non-proliferation measures such as so-called Proliferation Resistance technologies?
- Economical viability (cost-effectiveness) and competitiveness with nuclear weapon countries?