

Nonproliferation Policy and Safeguards R&D Initiatives in Japan

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Outline

- 1. Japan's Nonproliferation Policy**
- 2. Initiatives for Realizing Effective & Efficient IAEA Safeguards**
- 3. Advanced Safeguards Technology for Rokkasho Reprocessing Plant**
- 4. Conclusions**



2. Japan's Nonproliferation Policy

- Strong national sentiment for total elimination of nuclear weapons;
- Extensive efforts for nuclear disarmament and nonproliferation;
- NPT ratified in 1976;
- “Three Non-nuclear Principles”;
- Atomic Energy Basic Law limits to peaceful use only.



Framework for Nuclear Energy Policy

- Cabinet resolution of October 14, 2005:
 - Basic policy for promoting research, development and utilization of nuclear science and engineering;
 - To cover the period of the coming decade;
 - Emphasizing the importance of securing nuclear safety and security, and commitment to non-proliferation.



Measures for Assuring Peaceful Nuclear Use

- Adhere to “Three Non-nuclear Principles”;
- Strictly limit to peaceful use only;
- Participate in global nonproliferation regimes;
- Maintain nonproliferation awareness;
- Promote Nonproliferation commitment;
- Enhance transparency over Pu usage.



Nonproliferation Initiatives

- Nonproliferation efforts to enhance global/regional peace and stability;
- Various initiatives to materialize and facilitate effective & efficient IAEA SG;
- Active contributions to strengthening IAEA SG after Iraq & DPRK events, ratifying AP in 1999 first among countries with fully developed fuel cycle;
- After implementing AP measures in Japan, IAEA reached “extended conclusion” in 2004 to initiate integrated SG in Japan.



For Efficient and Effective SG

- Participation in international project – TASTEX, HSP, LASCAR and ITAP;
- Winning operator's cooperation: field tests, SG equipment development & supply;
- Conducting JASPAS to support IAEA in SG R&D;
 - SG system design/ SG Approach
 - Data collection/analysis/evaluation
 - Measurement method/technology
 - Containment/surveillance
 - Training
 - CFE.



For Efficient and Effective SG

- Various initiatives proved effective, including AP implementation trials and IS rehearsals at selected facilities, enabling the IAEA, the Japanese SSAC and the operators to gain practical experience for smooth implementation of AP and IS;
- TRO has been in operation supported by the Japanese Government for effective & efficient SG implementation in Far East region.



Rokkasho Reprocessing Plant



- RRP started construction in 1993 with the planned capacity of 800t U/y;
- Active test is currently under way;
- Commercial operation scheduled in 2007.



RRP SG Challenges

- Large throughput (800t U/yr);
- Continuous processing (e.g. evaporator);
- Automated operation (e.g. sampling);
- limited inspector access.



Large Scale Reprocessing (LASCAR) Project

- International project between 1988 and 1992 to review effective & efficient SG at a large scale commercial reprocessing plant;
- USA, UK, France, Germany (FRG), Japan, IAEA and EURATOM;
- It is feasible to devise effective & efficient SG, utilizing advanced SG techniques, including NRTA.



SG System for RRP

- Based on LASCAR Project findings, an effective and efficient SG system has been developed in consultation with the IAEA;
- In addition to traditional nuclear material accountancy, the following additional advanced SG technologies are adopted:
 - NRTA
 - solution monitoring
 - extended C/S
 - Automated data collection and evaluation



SG System for RRP

- For the sake of increased efficiency, IAEA and Japanese SSAC will share SG systems for joint use;
- On-site analytical laboratory (OSL) is operated for joint use for timely analysis of SG samples;
- Rokkasho Safeguards Center (RSC) is operated to accommodate national resident SG inspectors and SG analysts.

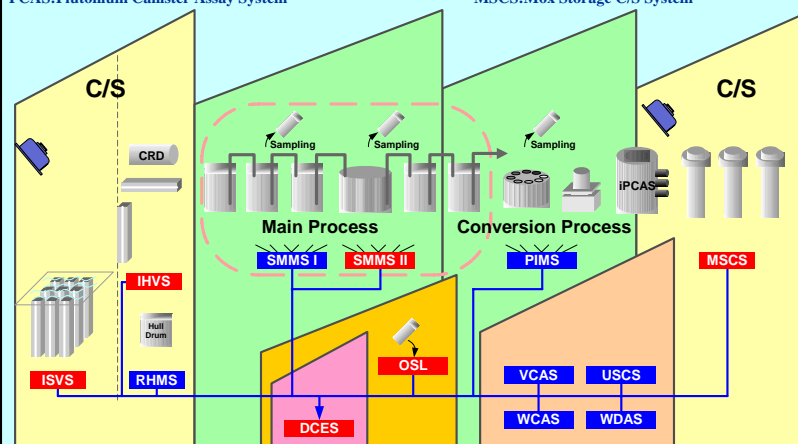


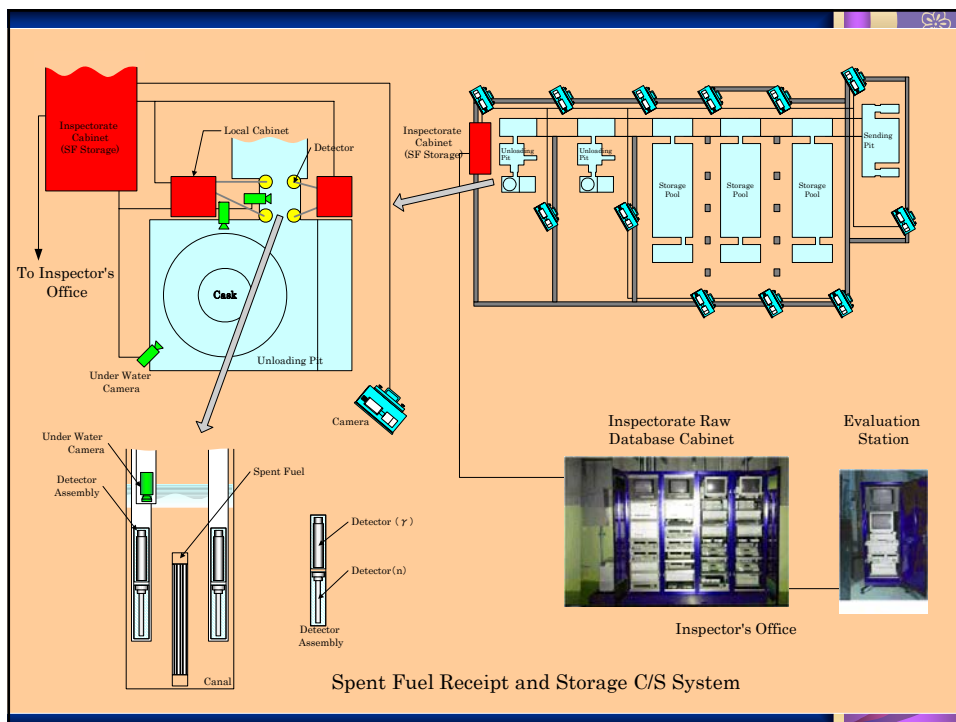
Advanced SG System for RRP

ISVS: Integrated Spent Fuel Verification System
 IHVS: Integrated Head-End Verification System
 RHMS: Rokkasho Hulls Drum Measurement System
 SMMS: Solution Measurement & Monitoring System
 DCES: Data Collection & Evaluation System
 PCAS: Plutonium Canister Assay System

RRP

PIMS: Plutonium Inventory Measurement System
 VCAS: Vitrified Canister Assay System
 USCS: Uranium Storage C/S System
 WCAS: Waste Crate Assay System
 WDAS: Waste Drum Assay System
 MSCS: Mox Storage C/S System





On-Site Laboratory (OSL)


Low-level Globe Boxes




High-level Hot Cells




Medium-level Globe Boxes



Mass-spectrometer





Rokkasho Safeguards Center



RSC, inaugurated in December 2003, houses Government and NMCC inspectors, OSL staff and other members.



Summary

- Various initiatives have been done in order to materialize and facilitate effective & efficient IAEA SG under NPT regime;
- Based on LASCAR Project findings, an advanced SG system has been developed for effectively and efficiently safeguarding RRP, in consultation with the IAEA, including automated remote verification technology, NRTA and solution monitoring;
- Similar efforts are foreseen for J-MOX.

