Current status of the refurbishment of five semi-hot cells at NRI Řež

Radim Kopřiva, Miloš Kytka
Nuclear Research Institute Řež
Integrity and Technical Engineering Division
Mechanical Testing Department
Outline

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- Refurbishment project
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  - Dismantling phase
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Facility - General Overview

- System consists of 51 hot and semi-hot cells situated in 3 floors
- 1970 – Hot cells facility was constructed in NRI Řež
- 1970 – 1978 – Attention to verify the fuel elements operational abilities
- 1978 – Extensive program of verification tests of the technology of 15Ch2MFA steel (in connection with WWER-440 reactor type manufacturing in former Czechoslovakia)
- 1984 – Program extended with 15Ch2NMFA verification tests (in connection with WWER-1000 type reactors)
- 1980 – 1985 – Reconstruction of semi-hot laboratory (a part of hot cells used for mechanical testing of irradiated specimens) to enable to study experimentally the change of mechanical properties of surveillance specimens of WWER type reactors.
Hot Laboratory - General Overview

- Shielded by 1,25 m of heavy concrete
- Assumed activity up to 370 TBq

Preparatory and auxiliary activities
- Unloading of irradiation containers
- Fluence monitors evaluation
- Specimen machining
- Specimen reconstitution

- Department of High Activity Laboratories and Irradiation Experiments
Semi-hot Laboratory - General Overview

- Shielded by 150 mm of lead
- Assumed activity up to 37 GBq
- Mechanical testing – structural materials from surveillance programs
  - Tensile testing
  - Impact testing
  - Static fracture toughness
  - Dynamic fracture toughness
  - Hardness testing
  - High temperature testing
  - SEM analysis
- Mechanical Testing Department
Refurbishment project – Initial state

- 5 semi-hot cells from former radiochemistry facility
- Goal of the refurbishment project – enlarge the testing capacity of Mechanical Testing department
Refurbishment project – Initial state

- Former radiochemistry facility
  - Glove boxes with several rod manipulators
  - Transport system connecting cell in operation
  - No α contamination
Refurbishment project – Preparatory activities

- Start of the project in 2009
  - Feasibility study
  - Approval of State Office for Nuclear Safety
Refurbishment project – Dismantling phase

- Construction of sealed area for dismantling works – from both sides of the cells
Refurbishment project – Dismantling phase

- Removal of glove boxes
- Removal of transport system shielding wall
Refurbishment project – Construction phase

- Construction of supporting structure
- Mounting of shielding steel plates
Refurbishment project – Construction phase

- Construction of welded inner SS layer
- Sanding of inner surface, lighting installation
Refurbishment project – Construction phase

- Painting of shielding wall
- Windows assembly
Refurbishment project – Construction phase

- Current status of semi-hot cells refurbishment – next steps
  - Installation of supply systems for water, air, liquid nitrogen etc.
  - Installation of manipulators
  - Installation of testing equipment

- Start of the operation is scheduled on October 2011
Refurbishment project - Safety aspects

- Attention to planning and photo documentation
- Detailed work instructions and procedures
- Continuous dosimetry measurements during dismantling works
Experience - Other projects

- Hot Cell for unloading of surveillance irradiation containers from Temelin NPP
- Hot Cell for repacking of SNF from NRI LVR-15 research reactor
Conclusions

- Profit from the experience with previous refurbishment projects
  - Modular design of new cells
  - Inner SS layer

- Knowledge management – Transfer of knowledge from experienced personnel to young colleagues

- Precise preparation of work assignments and photo documentation helps to reduction of personal doses

- Refurbishment works are carried out according to the project schedule

- Start of the operation is scheduled on October 2011
Thank you for your attention