CONSTRUCTION OF SEMI-HOT FACILITY FOR THE PET CENTRE OF NRI REZ

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Overview

- **Integrity and Technical Engineering Division** – supporting safe operation of WWER type reactors
  - Surveillance programs, Calculations, Component qualification, NDE etc.
- **Design and construction of hot cell facilities**
  - Construction of two semi-hot cell sets (five cells each set) for the production of radiopharmaceutics
  - Installation within new building – PET Centre (ÚJV Řež, a.s., Radiopharmaceuticals Division)
Radiopharmaceuticals Division

- Production of radiopharmaceutics since 1974
- PET (Positron Emission Tomography) – mainly production of Fludeoxyglukose inj. (18F-FDG)
  - Radiodiagnostic suitable for the monitoring of regional utilization of glucose using PET or PET/CT method as a tissue viability indicator. The active substance is transported into a cell by means of active transport mechanisms proportionally to glucose utilization.

- PET Centres
  - PET Center Prague in the Homolka Hospital in Prague
  - PET Center Brno in the Masaryk Institute of Oncology in Brno
  - PET Center Řež (completed in 2012 at Řež site)
**Technical Parameters**

- **Each set consists of five cells**
  - Four production cells
  - Dispense cell for the finalization of the radiopharmaceutical product

- **Lead shielding (100 mm) / shielding channel at the back of set (connection of cyclotron with production cells)**

- **Active ventilation system**

- **High requirements on inner/outer surfaces of cells**
Project Schedule / Milestones

- **February 2011**
  - Design activities / Planning
  - Supplier selection process (windows, lead shielding bricks, rod manipulators)

- **September 2011**
  - Finished semi-hot cell set no.1

- **November 2011**
  - Finished semi-hot cell set no.2

- **December 2011**
  - Electrical wiring / Other supply systems installation
  - Start of the test operation

- **April 2012**
  - End of the project
Construction phase (off-site)

- Supporting structure construction
Construction phase (off-site)

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- Supporting structure construction
Construction phase (off-site)

- Shielding walls/doors assembly and welding
Construction phase (off-site)

- Final off-site assembly
Construction phase

- Assembly at the PET Centre site
Construction phase

- Shielding assembly (top and bottom of the cells)
Construction phase

- Inner and outer SS layers installation
Construction phase

- Shielding windows installation (Pb glass, thickness 230 mm)
Construction phase

- Completed set of semi-hot cells
Construction phase

- Completed set of semi-hot cells
Experience - Recent projects

- Hot Cell for unloading of surveillance irradiation containers from Temelin NPP
- Hot Cell for repacking of SNF from LVR-15 research reactor
  - Proceedings from HOTLAB2010 (Samara, Dimitrovgrad)
Experience - Recent projects

- Refurbishment of five semi-hot cells at Rez (former radiochemistry facility)
  - Proceedings from HOTLAB2011 (Smolenice)
Summary

- Construction of two sets of semi-hot cells was carried out within the project schedule

**Facts**

- Cooperation with Czech suppliers only
  - Lead bricks – Triangl Hrob
  - Shielding windows – Brita, s.r.o.
  - Rod manipulators – JB Praha, s.r.o.
- 70 tons of lead bricks for the construction of the shielding
- Total weight of one semi-hot set is approx. 45 tons

**Upcoming projects in 2013**

- Refurbishment of two semi-hot cells (similar to the previous project)
- Improvements in 15 hot cells (exchange of manipulators, shielding windows and zinc bromide)
Thank you for your attention

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