SESSION 3 - POSTERS

ID 20- MCNP Model for Research Reactor (TRR-1/M1) Fuel Storage Rack Criticality Analysis IAEA-CN-226-20

- Criticality safety for the storage rack of TRR-1/M1 depends on several parameters: pitch, burnup, water density and absorber rods.
- The burnup affects the multiplication factor (k_{eff}) of spent fuel storage rack less than the pitch, the water density and the number of absorber rods.
- Replacing some fuel elements in the storage rack by cadmium absorber rods can decrease the probability for supercriticality to acceptable level.
- To reduce the risk of criticality, the rack should design for minimum lattice pitch more than 6 cm for 20 wt.% fresh fuel or cadmium absorber rods should be used.
- The criticality safety analysis according to standard for TRIGA spent fuel storage is necessary. Existing power reactor standard are not applicable because of the specific TRIGA fuel physical properties. Specific research reactor standards, recommendation, guideline and procedures for TRIGA reactor spent fuel are required and necessary.

ID 31 - CRITICALITY SAFETY AND BURNUP CREDIT ANALYSIS FOR MOX FUEL

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MCNPX Monte Carlo Computer Code was used to design and simulate the burn up of MOX assembly in a typical operating conditions of PWR reactor. MOX assembly is loaded with three different types of Pu isotopes , low , medium and high Pu content. The fuel burnt up to 85 Gwd/T.

The results illustrate the change of assembly multiplication factor with burnup. The change of fissile and actinide isotopes for every zone is determined. The concentration of fission products across the assembly is calculated.

ID- 42: Major consideration in safety assessment for Interim Spent Fuel Storage Facility in Korea

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- Accident Scenario Development based on Fukushima accident
- Mass balance Analysis of spent fuel in Korea
- Major assumption for accident scenario development
- Major consideration for safety assessment
  - The nuclide leakage radius
  - The damage rate of spent fuel
  - The inventory of spent fuel

Potential of active neutron interrogation to control fissile materials in "closed" fuel cycle ID 121

All-Russian Research institute of Automatics (VNIIA)

V.F. Batyaev, S.V. Sklyarov

Motivation: "Closed" fuel cycle is to be characterized by low (<0,1%) amount of actinides in nuclear wastes. There is a need of instruments to control a tiny amount of actinides (fissile materials) in case of high γ-background of wastes.

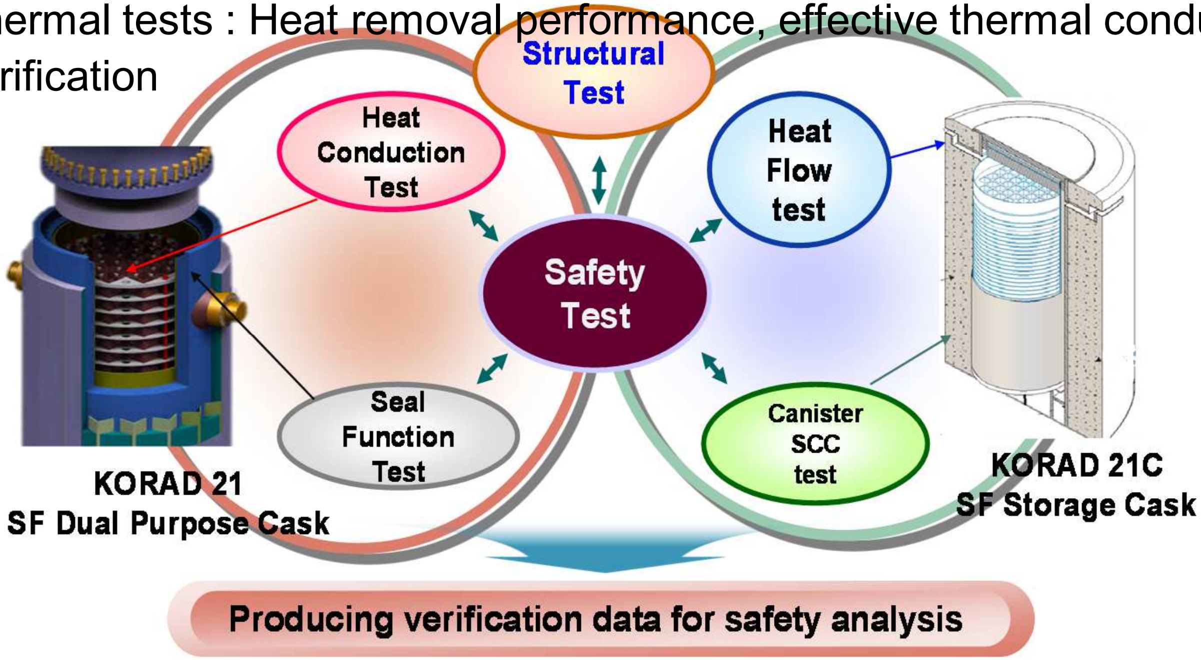
During 2001-2014 years at VNIIA had been carried out theoretical and experimental researches by differential die-away technique and realized the mobile active neutron assembly:

- chamber volume 160 liters
- ING-07T impulse neutron generator ($5 \cdot 10^8$ n/s, 400 Hz)
- minimal detectable fissile material (^{235}U) mass by 8 min measurement:
  - ✓ **0,6-1,2 mg** of unshielded ^{235}U in empty chamber
  - ✓ **10-20 mg** of ^{235}U in iron matrix
  - ✓ **50-100 mg** of ^{235}U in AT-400R boron container
- minimal amount detectable with relative error 10% fissile material (^{235}U) mass **10-20 mg**

Active neutron assembly

ID- 123: Safety tests of spent fuel storage systems in Korea

- SF transportation and storage casks under development for timely installation of interim storage facility in Korea
  - KORAD : Design and Analysis
  - KAERI : Safety test, research on spent fuel integrity
- The safety tests aims to demonstrate structural and thermal safety of the casks under development
  - Structural tests : seismic, tip-over, drop accidents
  - Thermal tests : Heat removal performance, effective thermal conductivity verification



ID- 149: Implementation of fundamentals of Guidance for an Integrated Transport and Storage Safety Case for Dual Purpose Casks for Spent Nuclear Fuel in Russian regulatory document

- Increase the amount and type of DPCs led to necessity of develop the standard approach related to DPS safety case.

- For this purpose the Federal Environmental, Industrial and Nuclear Supervision Service of Russia initiate development of safety guide in the field of nuclear energy, which had to contain recommendations to structure and content of DPS safety case reports.

- This safety guide based on IAEA Guidance for an Integrated Transport and Storage Safety Case for Dual Purpose Casks for Spent Nuclear Fuel.

- This poster contains short description of structure and content of developed safety guide.

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