

PBMR Fuel Irradiation Program

July 18, 2001

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PBMR Fuel Irradiation Program

- Purpose of presentation
 - Define the purpose of the PBMR fuel irradiation program
 - Describe the program plan and schedule
 - Describe the irradiation measurements to be taken
 - Describe the PBMR proposed joint international irradiation program

Purpose of PBMR Fuel Irradiation Program

- To confirm that the PBMR fuel, manufactured at the Pelindaba plant with modern processes and equipment to German specifications and quality control standards, will perform within the envelope of German measured irradiation data.
- To provide irradiation data for the steady state and transient operating conditions, as closely as possible, to those expected in the Demonstration Plant.

PBMR Irradiation Program

- Test Program in the RSA Safari Reactor
- Test Program in Russian IVV-2M Reactor

Fuel Baseline Program

Proprietary information not shown

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Proprietary information not shown

Proposed Test Program in the Safari Reactor

- Phase I

Proprietary information not shown

Proposed Test Program in the Safari Reactor, Cont'd

- Phase II

Proprietary information not shown

Proposed Test Program in Russian IVV-2M Reactor

- Test Process

Proprietary information not shown

- Coated Fuel Particle Tests

Proprietary information not shown

Proposed Test Program in Russian IVV-2M Reactor, Cont'd

- Fuel Element Tests

Proprietary information not shown

Proposed Test Program in Russian IVV-2M Reactor, Cont'd

Proprietary information not shown

Proposed Joint International Irradiation Program

Proposal

Irradiate PBMR fuel prior to completing the Pelindaba plant, using fuel from current manufacturing plants in different countries in the US. Advanced Test Reactor (ATR) in Idaho.

Advantages

USNRC will more easily participate in the Irradiation program.
Will establish further confidence in modern HTR fuel elements.
Develop in the US capability for HTR fuel irradiation testing.
Extend HTR database by irradiating fuel from different manufacturers
Provide additional data for model development.
Provide opportunity for RSA and USA scientists collaboration.

Program

Three spherical and one cylindrical fuel element irradiated from each manufacturer. RSA would add 12 elements when Pelindaba was complete. Target burnups of 80-90,000 MWD/Mtu. Tests will include pre and post characterizations, PIE examinations and heating tests for measurement of fission product release.

Conclusion

RSA Safari and Russian IVV-2M tests will confirm that fuel manufactured at Pelindaba will perform as successfully as previously tested German fuel under PBMR reactor conditions.