Spent Fuel Storage and Transportation

Mary Jane Ross-Lee (MJR2@nrc.gov)

Spent Fuel Project Office

U.S. Nuclear Regulatory Commission

Use of Operation and Maintenance Experience in the NRC Licensing Process

- Dynamic Process
- Lessons Learned influence new guidance in Operation and Maintenance
- Experience leads to refinement

U.S. NRC Regulations for Spent Fuel Transport and Storage

- Title 10 Code of Federal Regulations, Part 71 contains regulations for transportation of spent fuel
- 10 CFR Part 72 contains regulations for interim storage of spent fuel

Guidance Documents

- Standard Review Plan for Dry Cask Storage Systems (NUREG-1536)
- Standard Review Plan for Transportation Packages for Spent Nuclear Fuel (NUREG-1617)
- Standard Review Plan for Spent Fuel Dry Storage Facilities (NUREG-1567)
- Interim Staff Guidance (ISG)

Standard Review Plan for Dry Cask Storage Systems

- 1. General Description
- 2. Principal Design Criteria
- 3. Structural Evaluation
- 4. Thermal Evaluation
- 5. Shielding Evaluation
- 6. Criticality Evaluation
- 7. Confinement Evaluation

Standard Review Plan for Dry Cask Storage Systems (cont'd)

- 8. Operating Procedures
- 9. Acceptance Tests and Maintenance
- 10. Radiation Protection
- 11. Accident Analysis
- 12. Conditions for Cask Use
- 13. Quality Assurance
- 14. Decommissioning

Standard Review Plan for Transportation Packages for Spent Nuclear Fuel

- 1. General Information Review
- 2. Structural Review
- 3. Thermal Review
- 4. Containment Review
- 5. Shielding Review
- 6. Criticality Review

Standard Review Plan for Transportation Packages for Spent Nuclear Fuel (cont'd)

- 7. Operating Procedures Reviews
- 8. Acceptance Tests and Maintenance Program Review

Acceptance Tests and Maintenance Program Review

- Acceptance tests may include
  - Visual inspections and measurements
  - Weld inspections
  - Structural and pressure tests
  - Leakage tests
  - Component tests
  - Shielding tests
  - Neutron absorber tests
  - Thermal tests

Acceptance Tests and Maintenance Program (cont'd)

- Maintenance program review includes
  - Inspection and Monitoring Systems
  - Periodic tests (leakage, thermal, structural, pressure) of cask components
  - Repair, replacement, and maintenance of cask components Leakage tests

Interim Staff Guidance (ISG)

- 1. Damaged Fuel
- 2. Fuel Retrievability
- 3. Post Accident Recovery
- 4. Cask Closure Weld Inspections
- 5. Confinement Evaluation
- 6. Minimum Initial Enrichment
- 7. Cask Heat Transfer in Transport Accident

Interim Staff Guidance (cont'd)

- 8. Limited Burnup Credit
- 9. Storage of PWR Fuel Assembly Components
- 10. ASME Code Exceptions
- 11. Burnup in Excess of 45 GWD/MTU
- 12. Buckling of Irradiated Fuel
- 13. Real Individual

Interim Staff Guidance (cont'd)

- 14. Supplemental Shielding
- 15. Materials Evaluation
- 16. Emergency Planning
- 17. Interim Storage of GTCC
- 18. Final Closure Welds as Confinement Boundary
- 19. Moderator Exclusion

In Conclusion

- NRC Guidance continues to evolve
- Experience improves our Licensing Process

Useful Web Address

http://www.nrc.gov/waste/spent-fuel-storage/regs-guides-comm.html

- Interim Staff Guidance (ISG)
- Dry Cask Storage Systems (NUREG 1536)
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- Transportation Packages for Spent Nuclear Fuel (NUREG 1617)