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SAND2013-10179C

Sandia National Laboratories

DOE Gap Closure Activities to Date and Path Forward

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Charlotte, NC

December 3-5, 2013

SAND???C

U.S. DEPARTMENT OF ENERGY | NNSA National Nuclear Security Administration

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Goal of the Used Fuel Disposition Campaign Storage and Transportation Task

Close the Gaps in the Technical Basis for Extended Storage and Transportation of Used Nuclear Fuel:

- to demonstrate used fuel integrity for extended storage periods
- for fuel retrievability and transportation after long term storage
- for transportation of high burnup fuel.

IDENTIFIED TASKS

- **Review all work since 2010 that has been done to close the technical gaps**
- **Illustrate how the integration of current and past experimental, modeling, and programmatic work is closing the technical data gaps.**
- **Calibrate the prioritized gaps with today's environment (policy/needs/budget, etc.)**
- **Develop a revised multi-year program plan based this reassessment of priorities and programmatic drivers.**

DELIVERABLES BY:

ANL
INL
LANL
LLNL
ORNL
PNNL
SNL
SRNL

REVIEW DELIVERABLES

Year	Assess/ Collect Information	Plan	Experiment	Model
2010	6			
2011	9	3		2
2012	16	13	5	7
2013	16	10	12	18
2014 *	4	8	18	15

GAP-SPECIFIC DELIVERABLES UP TO 2013

Cross-Cutting Gaps	#	Labs
Thermal Profiles	5	PNNL, ORNL
Stress Profiles	14	SNL, PNNL, ORNL
Monitoring	8	LANL, PNNL, INL, ORNL
Fuel Transfer Options	3	INL, PNNL, SNL
Drying Issues	1	SRNL
Burnup Credit	5	ORNL
Moderator Exclusion	3	INL
Examination of the Fuel at the INL	3	INL

GAP-SPECIFIC DELIVERABLES UP TO 2013

Gap	#	Labs
Canister – Corrosion	7	SNL, ORNL
Cladding	18	ANL, INL, ORNL, PNNL, SNL
Neutron Poisons	1	LANL
Concrete Overpack (Monitoring and Aging Management)	6	ANL, LANL
Cask – Polymer Degradation	2	SRNL

JUST STARTING:

- **Summarize Progress on Closing Gaps**
  - Will compare progress in deliverables against the gap report and reassess needs

- **Prepare 5-year Plan for Research and Development**
  - Will build on previous plans
  - Will coordinate with the uncertainty quantification task
  - To include experiments (single effects, small scale, and engineering scale), modeling, and in-service inspections to further close gaps

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Back Up

REVIEW DELIVERABLES

Used Fuel Disposition (UFD)
Storage and Transportation – Relevant
Up to 9/30/2013

Total Lab Deliverables	**175**
Total in System	**124**
Technical Content	**100**

Also reviewing a few relevant NFST (Nuclear Fuels Storage and Transportation) Planning Project deliverables

2010 TO 2013 DELIVERABLES

- Cladding - 18
- Stress Profiles - 14
- Monitoring - 8
  - Canister Corrosion - 5
  - Concrete - 3
- Canister Corrosion – 7
- Testing Facilities - 7
- Thermal Profiles - 5
- Burnup Credit - 5
- Fuel Transfer Options - 3
- Moderator Exclusion - 3
- Examination of the Fuel at the INL - 3
- Cask Polymer Degradation - 2
- Drying Issues - 1
- Neutron Poisons -1

2014 DELIVERABLES

High Burnup Demonstration - 11
Cladding - 11
General - 6
Stress Profiles - 5
Thermal - 5
Canister Corrosion - 4
Fuel Transfer Options - 3
Monitoring – 2
Drying Issues - 1
Bolted Cask
- Embrittlement of Polymers - 1
- Degradation of Seals and Bolts - 1