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September 07, 2012

To: Ken Sorenson

From: Robert T. Jubin

Subject: Completion of the ORNL Fuel Cycle Research and Development (FCR&D) Level 4 Milestone – ST T&E Capability Development-ORNL FT-12OR080204, MS# M4FT-12OR0802043, “Mid-Year Status Report,” due 9/28/2012

This letter documents the completion of the FCR&D Level 4 milestone for the ST T&E Capability Development - ORNL work package (FT-12OR080204), “Mid-Year Status Report” (M4FT-12OR0802043), due September 28, 2012. A letter report describing the activities of ORNL personnel on the T&E Capability Development Team is attached to this memo.

If you have any questions, please contact me at (865) 574-4934, Rob Howard at (865) 241-5750 or John Wagner at (865) 241-3570.

cc: C. V. Bates (INL)
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Letter report of the ORNL FY12 activities supporting Storage and Transportation Testing and Evaluation Capabilities Development task within the DOE-NE Fuel Cycle Technologies' Used Fuel Disposition Campaign

The objectives of this task are to field near-term tests that support the development of the technical justification for extended storage and subsequent transportation. In order to expedite deployment of these tests, it is expected that collaboration with industry will be conducted to maximize efficiencies in obtaining material, storage and transportation components, and siting facilities for the field tests. The focus of this field testing assessment will be on testing that requires platforms outside a National Laboratory or hot cell.

Oak Ridge National Laboratory (ORNL) efforts were focused this year on supporting the regulatory analysis associated with fielding a storage platform at an existing commercial Independent Spent Fuel Storage Installation (ISFSI) site.

A review of the requirements set forth in 10CFR72.48 was performed. Specifically, this portion of the Code of Federal Regulations focuses on changes, tests and experiments involving spent fuel storage casks or fuel storage facilities. The review of this regulation identified a number of points that must be considered as part of the experimental design process. Ideally, the Final Safety Analysis Report (FSAR) for the systems being considered will be broad enough to allow any required modifications and planned testing to fall under § 72.48(c)(1); otherwise, a license amendment under the requirements of § 72.56 will be required. Before this can be determined, the specific tests and systems modification must be understood and the FSAR for the specific systems under consideration must be reviewed.

ORNL staff attended the Extended Storage Collaboration Project (ESCP) meeting at the Electric Power Research Institute (EPRI) offices in Charlotte, NC on December 6-8, 2011. The ESCP effort is being coordinated by EPRI. ESCP team consists of a group of organizations representing the nuclear industry, federal government, national laboratories, and suppliers of used fuel dry storage systems chartered with investigating aging effects and developing mitigation options for the extended storage and transportation of used/spent nuclear fuel and high level waste (HLW). The ESCP intent is to coordinate efforts in developing technical bases to ensure safe, extended used fuel storage (greater than 60 years) and future transportability. The primary focus of the December 2011 meeting was to review recently completed gap analyses conducted by EPRI, the Department of Energy, the US Nuclear Regulatory Commission, and the US Nuclear Waste Technical Review Board. It was noted that the DOE, EPRI, and NRC all identified gaps related to the condition of the welded canisters as a high priority. While DOE identified gaps related to the condition of the used fuel at the time of transport as a high priority, both EPRI and the NRC generally ranked these issues as a medium priority. In addition to reviewing the various gap analyses and research priorities, preliminary plans and approaches for coordinating efforts related to in situ inspection of storage canisters for signs of corrosion and data collection on marine environments was also discussed.

ORNL staff also served as a technical reviewer on the Level 2 Milestone report FCRD-USED-2012-000094, "Considerations for Assessing the Impact of Ambient Environmental Conditions on Steel Canister Corrosion at Dry Cask Storage Sites." A number of substantive comments were provided to the authors regarding the structure and purpose of the report. The final draft report issued on July 30 incorporated these comments along with those from EPRI into a much improved document.

ORNL staff attended the High Burn-up Used Fuel Demonstration Workshop hosted by the Idaho National Laboratory on August 22-23, 2012. The workshop brought together representatives from nuclear utilities, the Nuclear Energy Institute, EPRI, the Nuclear Regulatory Commission, dry storage system vendors, the national laboratories and the Department of Energy Office of Nuclear Energy to assist in the identification and resolution of issues that must be addressed in an integrated strategy for a used fuel demonstration program.

Finally, ORNL staff began investigating the possibility of obtaining small pieces of DOE-owned high burn-up commercial spent fuel for potential spent fuel bend testing in support of the Used Fuel Disposition Campaign. This effort will be continued in FY13.