

International Conference on Management of Spent Fuel from Nuclear Power Reactors: An Integrated Approach to the Back End of the Fuel Cycle



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The High Burnup Confirmatory Data Project

The United States (US) is interested in demonstrating the ability to safely store—for many decades—and then transport spent nuclear fuel (SNF). The potential need to store SNF for many decades will have a near-term and potentially significant impact on US nuclear plant licensing and operations. While dry storage of lower burnup SNF [less than 45 gigawatt days per metric ton uranium (GWD/MTU)] has occurred in the US since 1986, dry storage of high burnup SNF has been more recent. As of 2012, approximately 200 dry storage casks have been loaded with at least some high burnup SNF. Furthermore, almost all SNF being loaded in the US is now high burnup. While current knowledge indicates storage and transportation will not be a problem, high burnup SNF has different mechanical properties than lower burnup SNF, and industry needs additional data on high burnup SNF under typical conditions.

To assist in the collection of this data, the US federal government has initiated a High Burnup Confirmatory Data Project (CDP) project to develop and implement a plan to load an instrumented Transnuclear (TN)-32 bolted-lid cask with high burnup fuel and store the cask and fuel on an Independent Spent Fuel Storage Installation (ISFSI) for a period of ten years. The project is led by the Electric Power Research Institute (EPRI) and includes members from the US federal government, the US nuclear industry, and US national laboratories.

A Test Plan for the CDP has been developed to establish how data will be collected from a SNF dry storage system containing high burnup fuel. The high burnup fuel to be included in this project includes four different cladding types: standard Zircaloy-4, low-tin Zircaloy-4, Zirlo, and M5. The Test Plan outlines the data to be collected; the high burnup fuel to be included; and the storage system design, procedures, and licensing necessary to implement the Test Plan. The CDP will include temperature and gas sampling as well as pre-characterization of fuel rods similar to the ones being stored. The main goals of the project are to provide confirmatory data on the behavior of high burnup fuel under typical dry storage conditions that can be used for model validation and potential improvement, provide input to future SNF dry storage cask designs, support license renewals and new licenses for ISFSIs, and support transportation licensing for high burnup SNF.

Country/ int. organization

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