

SPENT NUCLEAR FUEL: Main Page Content

Fauske & Associates has supported the Hanford Spent Nuclear Fuel Program (SNFP) since its inception in 1994. The goal of the Hanford SNFP is to relocate approximately 2000 tons of metallic uranium spent nuclear fuel from its present storage location, under water in the K Basins adjacent to the Columbia River, to a dry storage location high in the central plateau of the Hanford site.

Fuel assemblies, many of which are damaged and therefore chemically reactive, will be packed into stainless steel cylinders known as MCOs (Multi-Canister Overpacks) and vacuum dried near the K basins. About 6 tons of fuel, comprising around 250 original fuel assemblies, will fit into each MCO, which is 2 feet in diameter and somewhat more than 13 feet tall.

About 400 MCOs will be stored in vault tubes at the Canister Storage Building (CSB) in the Hanford 200 area. Two MCOs will be stacked, one upon another, in each vault tube, and natural air circulation will cool the vault tubes array. Fuel movement will begin in November 2000. Fuel will be stored for 40 years at the CSB.

The Hanford SNFP is sponsored by the U.S. Department of Energy (DOE). Fluor Daniel Hanford directs the Hanford SNFP, under which FAI is a subcontractor. Support provided by the FAI Waste Technology group has included:

- Participation in management and technical review of the original concept with Westinghouse Hanford, the original contractor,
- Programmatic development and process scoping calculations for technology acquisition,
- Survey of chemical reaction and accident issues for the Environmental Impact Statement,
- Participation in the Technology Basis Validation management and technical review by Duke Engineering & Services Hanford, the successor contractor,
- Development of the HANSF computer program for simulation of fuel behavior in an MCO for all process steps,
- Key contributions to the sealed MCO storage strategy including:
 - Estimation of reactive surface area in an MCO,
 - Simulation of normal and off-normal conditions during vacuum drying, shipping, and storage,
 - Estimation of the inventory of corrosion product and non-fuel compounds in an MCO after vacuum drying,
 - Estimation of the water inventory in an MCO after vacuum drying, and
 - Prediction of chemical reactions, radiolysis, and pressurization during the 40 year dry storage period
- Technical basis development for uranium pyrophoricity evaluation,
- Expert evaluation of experimental data for fuel oxidation and corrosion product water release,

- Evaluation of fuel reaction issues in and outside the K basins,
- Methods development for analysis of SNF sludge (corrosion products remaining in the K basins), and
- Representation of SNFP positions to external reviewers, DOE, and the Defense Nuclear Facilities Safety Board (DNFSB) staff.

FAI continues to serve the present contractor, Fluor Daniel Hanford, providing technical basis evaluations and tools for the SNFP.