

# 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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## Development of an Execution Strategy Analysis (ESA) Capability and Tool for Storage of Used Nuclear Fuel (UNF)

The Nuclear Fuel Storage and Transportation Planning Project (NFST), under the U.S. Department of Energy, Office of Nuclear Energy, Office of Fuel Cycle Technology, is developing foundational capabilities to support the application of system engineering and decision analysis principles to inform future decisions regarding the deployment of a consolidated interim storage facility (ISF) for managing used nuclear fuel (UNF) and High Level Waste (HLW). The development of an Execution Strategy Analysis (ESA) capability and tool is a key part of evaluating alternative strategies for future deployment of a consolidated ISF using a consent-based siting process per the Administration's Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste (Strategy). The ESA tool allows for on-going performance assessment of the evolving project plan/strategy that takes into account significant assumptions, risks, and uncertainties throughout the project lifecycle.

Deploying a consolidated ISF will be a complex social and technical endeavor. There will be uncertainties regarding many aspects associated with meeting key milestones for full implementation; and also both programmatic and technical risks associated with these milestones.

The formal ESA approach being applied by the NFST goes beyond traditional project analysis tools. NFST developed a dynamic simulation tool that explicitly models and assesses the impacts of uncertainties (activity durations and costs), constraints (policy, legislation, regulatory), risks (technical, non-technical), and opportunities.

The ESA process has provided a single coherent framework that describes key milestones that must be achieved and the activities that must be completed to deploy a consolidated ISF. The process has also developed a comprehensive registry of risks and opportunities associated with deployment. In total, these provide a common understanding of the overall effort required.

In addition, the ESA process and the results of the dynamic, probabilistic simulation model can be used to support the development of plans, budgets, and alternative strategies for meeting the goals in the Administration's Strategy.

The paper will describe the process by which the ESA capability and tool are developed and address the value of such a process in developing and implementing a long-term strategy for managing UNF and HLW.

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