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The Use of System Analysis and System Engineering to Inform the Implementation of an Integrated Waste Management System

The Nuclear Fuels Storage and Transportation Planning Project, under the US Department of Energy Office of Nuclear Energy Fuel Cycle Technologies program, is developing tools and techniques, gathering data and information, and conducting analyses to inform future decisions regarding the waste management system. Spent Nuclear Fuel (SNF) management system analysis, systems engineering, and decision analysis principles are being used to develop concepts for potential waste management system configurations and inform future decisions regarding integration. The application of these techniques to this complex and challenging problem have been recognized as being essential by the Blue Ribbon Commission for America's Nuclear Future and the US Nuclear Waste Technical Review Board. Flexibility, adaptability, phasing, and step-wise learning are key considerations in the overall waste management system evaluations.

These studies are informing alternatives for managing SNF generated by the current fleet of light water reactors operating in the US. The objectives of the effort are to:
• Provide quantitative information with respect to a broad range of SNF management alternatives and considerations
• Develop an integrated approach to evaluating storage, transportation, and disposal options, with emphasis on flexible implementation options.
• Evaluate impacts of storage choices on SNF storage, handling, and disposal options
• Identify alternative strategies and evaluate with respect to cost and flexibility
• Consider a broad range of factors including repository emplacement capability, thermal constraints, repackaging needs, storage and transportation alternatives, and impacts on utility operations.

Country/ int. organization

USA/Oak Ridge National Laboratory

Primary author: Mr HOWARD, robert (Oak Ridge National Laboratory)

Co-authors: Mr TRAIL, Casey (Argonne National Laboratory); Mr WHEELER, Jack (Department of Energy); Mr FORTNER, Jeff (Argonne National Laboratory); Dr JARRELL, Joshua (Oak Ridge National Laboratory); Mr NUTT, Mark (Argonne National Laboratory); Mr JOSEPH, Robby (Oak Ridge National Laboratory)

Presenter: Mr HOWARD, robert (Oak Ridge National Laboratory)