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

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Questions Related to Implementation of Interim Storage

What are

- Implementation approaches for meeting the *Strategy’s* goals?
- The critical path milestones and activities?
- The interdependencies across program elements?
- Key program risks and potential mitigation strategies?
- Impacts of various policies and potential legislation?
- The long lead time activities?
- Near term activities that provide schedule benefit and reduce risks?

Cannot answer one without thinking about all – “integrated thinking is key”
ESA – A Key Part of NFST Integrated Waste Management System Analysis

- **Multi-Objective Evaluation Framework**
  - Stakeholder objectives & value measures
  - Attributes of alternative system architectures
  - Operational uncertainty

- **Facilities and Infrastructure Analysis**
  - Operational end states
  - Design of alternative system architectures
  - Selection of optimal system architecture

- **Execution Strategy Analysis**
  - Development pathways
  - Major decision milestones
  - Design of alternative implementation strategies
  - Selection of optimal strategies

**Execution Plan**

**Subject Matter Experts; Other Analyses**

- Alternative implementation strategies/plans
- Development uncertainty
The ESA approach builds on traditional project management tools (i.e., Gantt Charts, WBS) and provides additional insight

- Integrates all key project elements
- Explicitly models uncertainty and its impacts
  - Traditionally cost and schedule – other important metrics can be included (i.e., jobs)
- Explicitly models risks and opportunities
  - Technical and non-technical
  - Associated uncertainties
- Allows for the assessment of alternative scenarios to provide information on potential impacts and benefits of alternative implementation strategies
- Identified all milestones and activities required to start a Pilot ISF (and expansion to a Larger ISF)
- Sequenced them, identifying all interdependencies
- Quantified duration and cost; and uncertainty
- Identified and quantified risks
  - Technical and programmatic
  - “Controllable” and “non-controllable” risks
- Implemented into a dynamic probabilistic simulation tool to evaluate different scenarios and strategies
- Analyzed results to gain insight

Subject matter experts used during all steps
Explicitly model and assess impacts

- Uncertainties
  - Activity duration/cost
  - Funding
- Constraints
  - Policy (i.e., need for legislation)
  - Legislation
  - Regulatory
- Risks (strategy/cost/schedule)
  - Technical and non-technical
  - Policy
  - Regulatory change

Identify and evaluate alternative strategies and approaches

- Mitigation
- Optimization
Sensitivity Analysis: Milestone Completion Date

Annual Expenditure Rate

Statistics

- 10% 90%
- Mean
Analysis of the Likelihood a Milestone is on the Critical Path

<table>
<thead>
<tr>
<th>Programmatic</th>
<th>Licensing, NEPA, Permitting for Pilot ISF</th>
<th>Siting and Coordination</th>
<th>Reactor Infrastructure for Transport</th>
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