



U.S. DEPARTMENT OF
ENERGY

Nuclear Fuels Storage & Transportation Planning Project
Office of Fuel Cycle Technologies

Nuclear Energy

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

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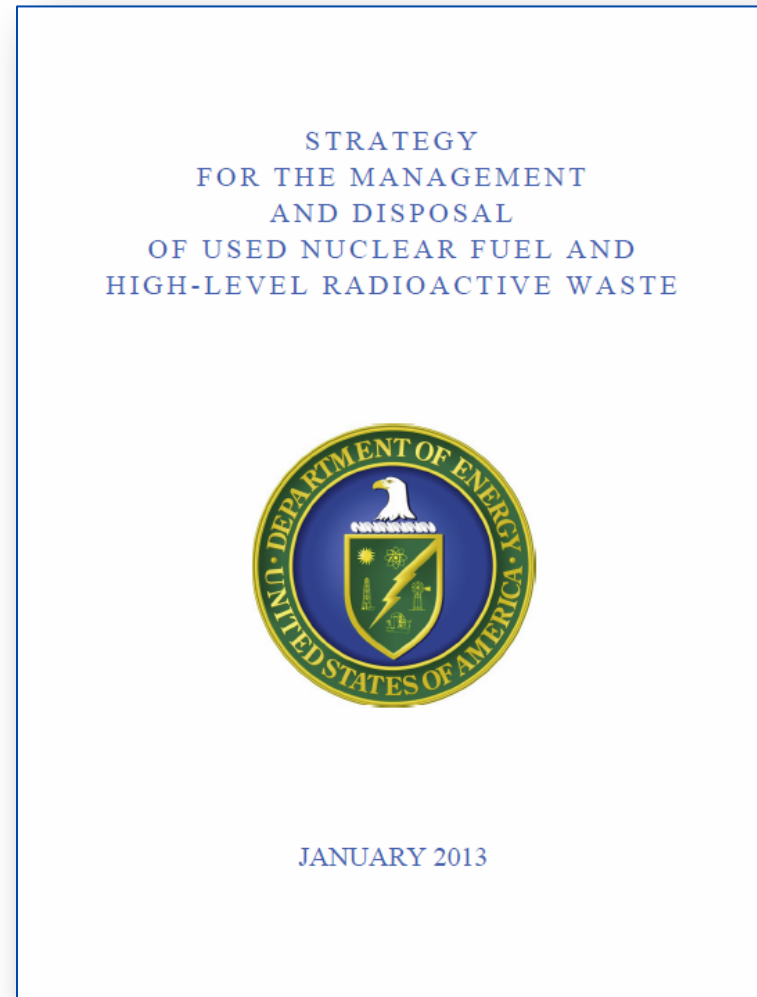
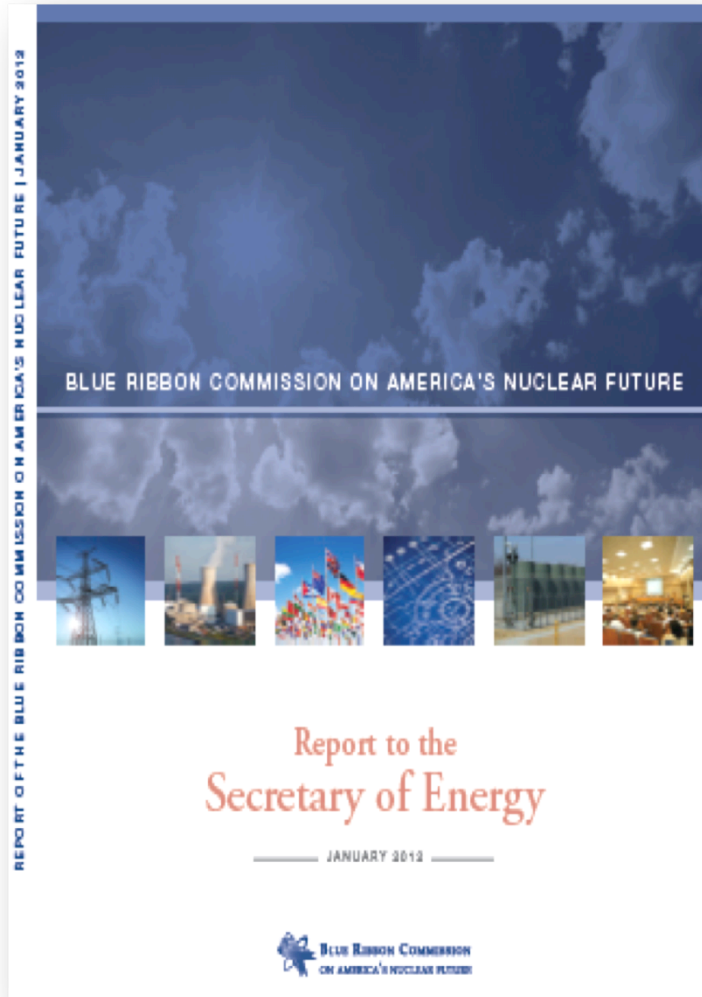




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NFST – Laying the Groundwork for Implementing Interim Storage





Questions Related to Implementation of Interim Storage

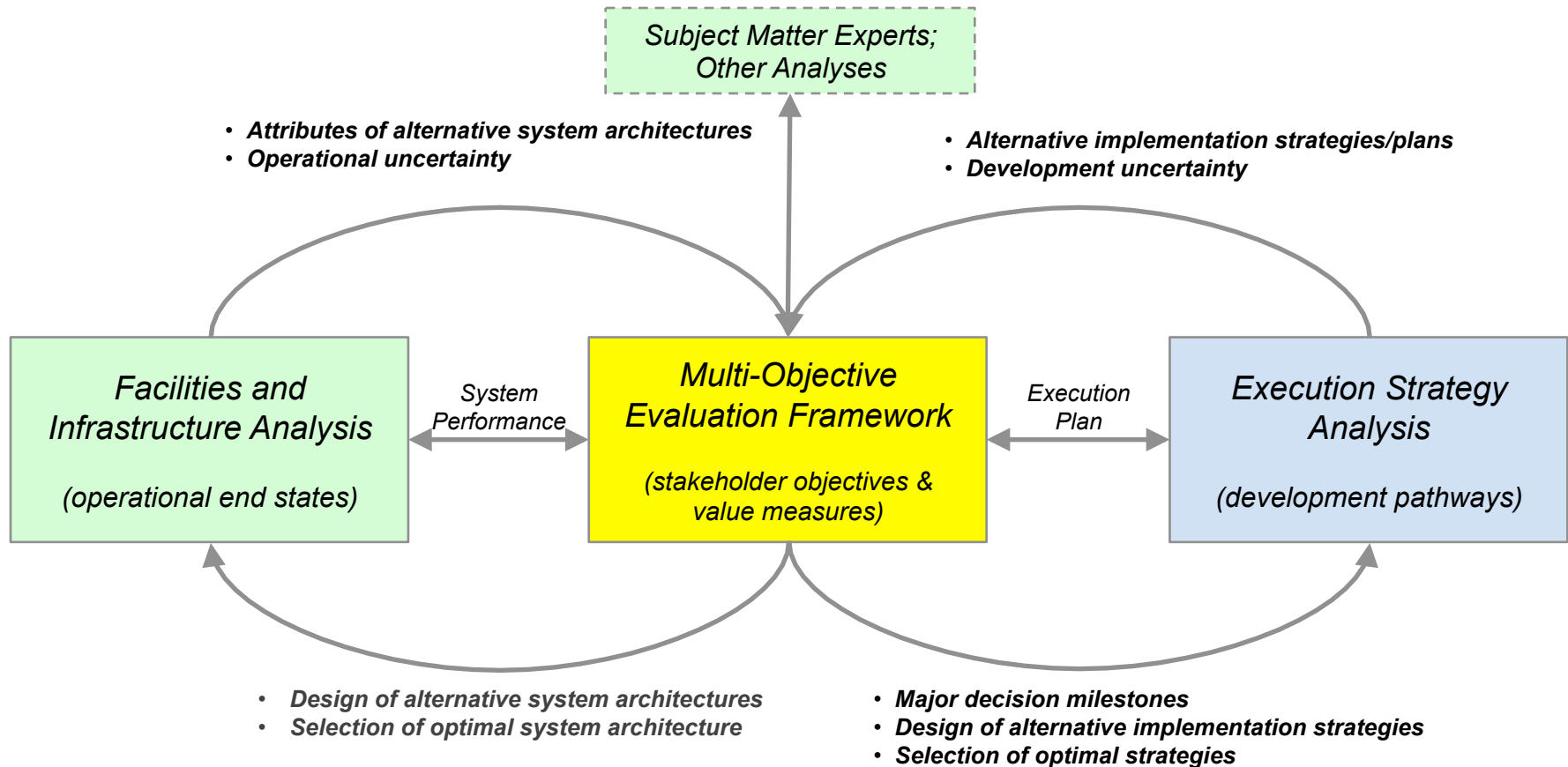
■ What are

- 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





Execution Strategy Analysis (ESA) Complements Traditional Project Management Tools

- **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



Execution Strategy Analysis Approach – NFST Example

- 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



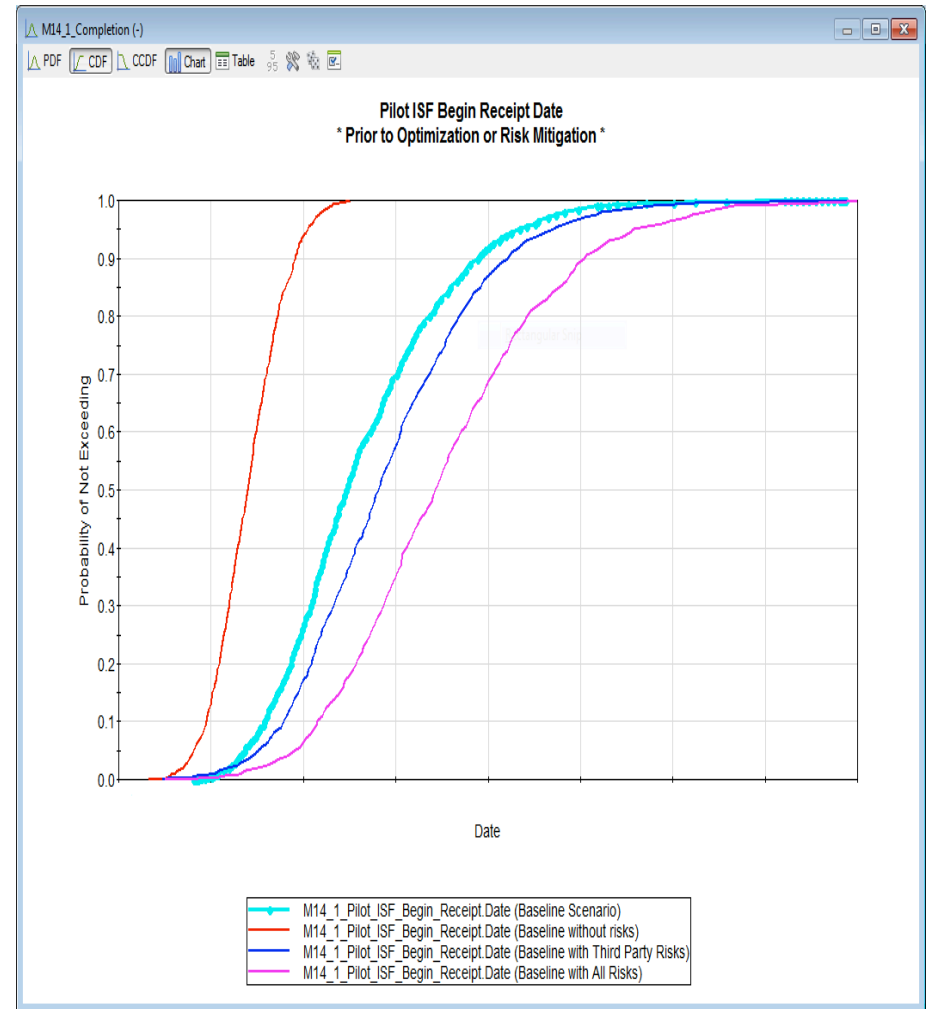
ESA – Performance Assessment of Alternate Implementation Strategies

■ 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

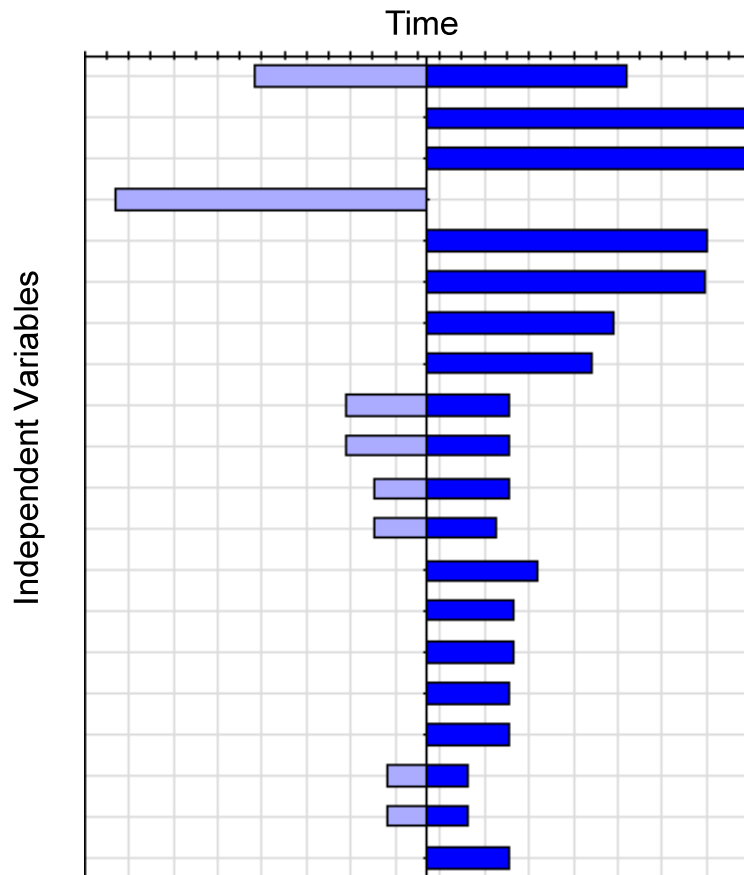
- **Mitigation**
- **Optimization**



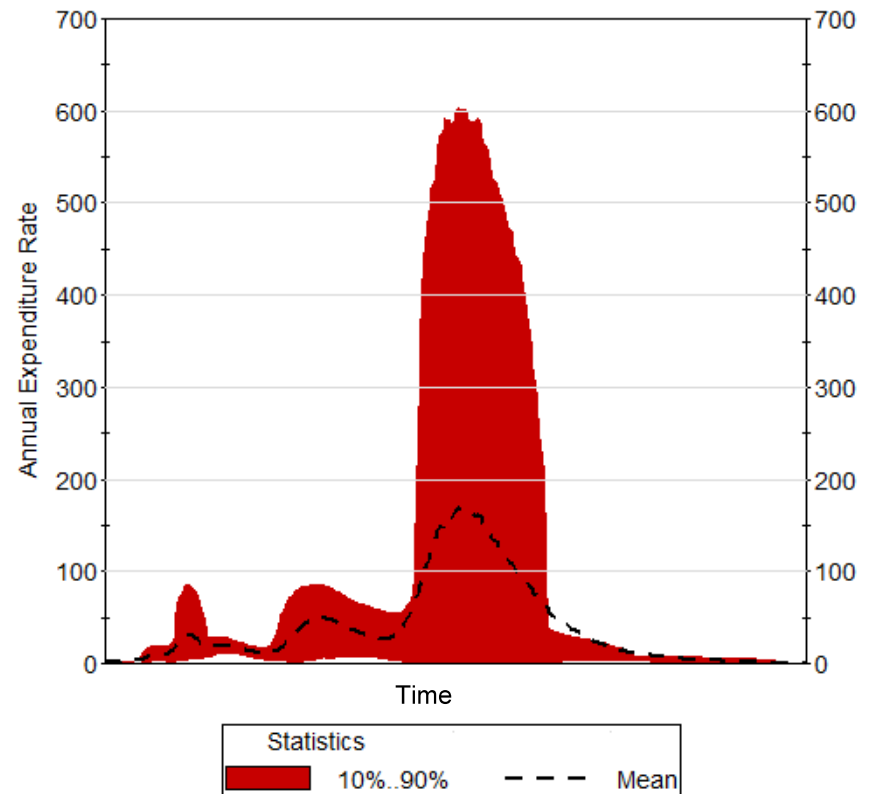


ESA - Key Outputs Support Analysis of Implementation Scenarios

Sensitivity Analysis: Milestone Completion Date

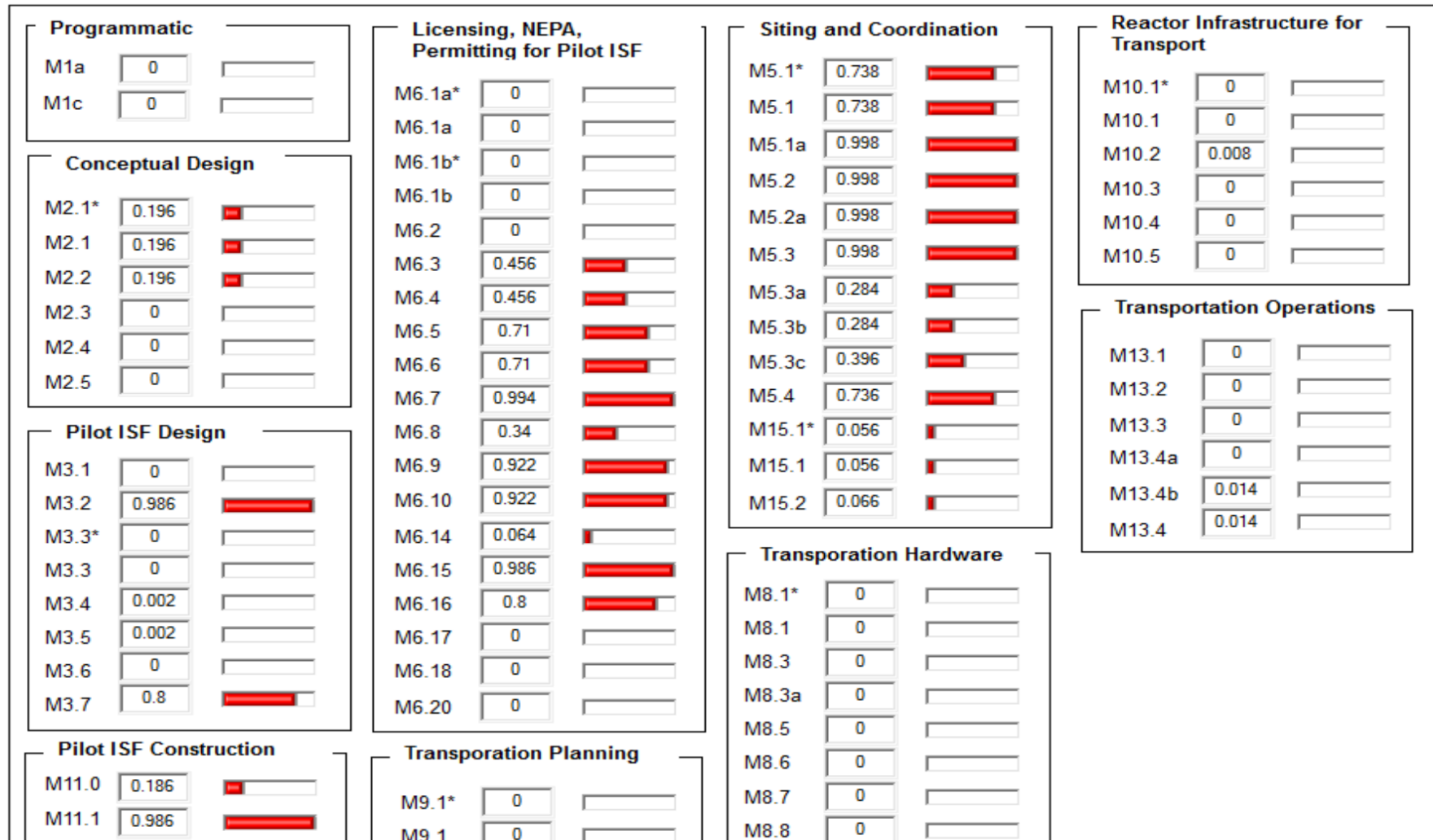


Annual Expenditure Rate





Analysis of the Likelihood a Milestone is on the Critical Path





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