Recommendation #256
Infrastructure Investment in System Planning

Background

The Department of Energy's (DOE) projects are often first-of-a-kind projects that require extraordinary effort and the use of best practices and skills to manage risks. Such is the case of the projects and facilities associated with the Liquid Waste System. Viewed as an entire system, these operations include the H and F Tank Farms, the Interim Salt Disposition Project (ISDP)[1], the Salt Waste Processing Facility (SWPF), Saltstone, the Defense Waste Processing Facility (DWPF), and the Effluent Treatment Facility (ETF). The current Site Treatment Plan (STP) identifies the Liquid Waste System mission as safely treating and removing 36 million gallons of radioactive liquid waste and closure of the 49 underground storage tanks in which the waste now resides by 2028 (Ref. 1).

The Liquid Waste System planning process evaluates short range, mid range, and long range consequences and includes project risk assessments. This assessment looks at identified risks and risk handling strategies (Ref. 2). Risk planning is a disciplined approach and includes plant infrastructure. This planning process relies on mature process planning and risk management to avoid program impacts. Major risk management is investigated including tank space, equipment failures, technology, process performance, project integration, external coordination, and collection and registration of emergent risks.

Risk management is a process of well-defined steps, which, when taken in sequence, supports better decisions by contributing to a greater insight into risks and their impacts on operational management. As it relates to infrastructure, risk management helps classify the criticality of equipment; the most likely modes of failure; the impacts of these failures in terms of cost and schedule; and what critical spares will be required in the event of a failure. If we can identify, manage and contain risks, we can substantially reduce the impact to the overall system. However, balancing the likelihood of equipment failure against the liability of the overall system operation can be difficult.

Comment

In ideal risk management, a prioritization process is followed whereby the risks for operations and milestones with the greatest impact and the greatest probability of occurring are handled first, and risks with lower probability of occurrence and lower loss are handled in descending order. In practice, the process of assigning priorities between risks with a high probability of occurrence but lower impact versus a risk with a high impact but lower probability of occurrence can often be difficult.

[1] (ISDP includes the Deliquification, Dissolution & Adjustment Process - DDA, Actnide Removal Process - ARP and Modular Cesium Removal Unit - MCU)

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In addition, ideal risk management minimizes spending while maximizing the reduction of risk. Risk management is simply a practice of systematically selecting cost effective approaches that minimize risk to the operating system. Some risks can never be fully avoided or mitigated simply because of financial and practical limitations. Therefore, the Savannah River Site (SRS) Citizens Advisory Board (CAB) understands that all organizations have to accept some level of residual risk for management.

However, the SRS CAB has concerns about the close interconnections of the major facilities associated with the Liquid Waste System. In a previous recommendation, the SRS CAB requested that SRS incorporate a risk-based approach to the Liquid Waste System using a quantitative analysis whenever possible (Ref. 3). The emphasis was on how impacts to any single system or facility affect the functional ability of the entire system to perform its mission and to meet its milestones. In similar fashion, other recommendations requested an integrated management approach (Ref. 4) or systems-approach (Ref. 5) when evaluating the overall Liquid Waste System. The SRS CAB is always interested in accelerating existing closure dates and reducing the overall life cycle costs of the Liquid Waste System. Increased investments in infrastructure may be a way to accomplish both objectives.

Recommendation

The SRS CAB recommends that DOE by September 23, 2008:

1. Provide an overview of how infrastructure risks on operations, closures, and regulatory milestones are evaluated over the entire Liquid Waste System.

2. Provide assurances that the planned operating capacity of the Liquid Waste System is adequate to meet the planned liquid waste mission by 2028 and that all efforts have been made to identify any major existing equipment failures and risks that could potentially jeopardize this end date.

3. Identify, quantify and communicate any existing limiting equipment, process or facilities from Recommendation #2 above. For this equipment, the SRS CAB is interested in the operational criticality of equipment; the most likely modes of failure; the effects these failures might have on other equipment and operational commitments; and what critical spares will be required in the event of a failure. The emphasis should be on how impacts to equipment or facility failure affect the functional ability of the entire Liquid Waste System to perform its mission and to meet regulatory milestones.

4. Identify any new (or larger size) equipment or facilities that could be installed to actually increase the capacity of the Liquid Waste System to accelerate the 2028 mission and note the infrastructure investments required to achieve this increase in capacity.

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References

1. Clean-up Progress – Clearing the Way for the Future, presentation by Terrel J. Spears – DOE-SR, June 24, 2008.
2. Infrastructure Review, presentation to the Waste Management Committee by Wyatt Clark – WSRC, June 24, 2008.
3. Citizens Advisory Board Recommendation No. 230 (adopted March 28, 2006), "SWPF Decision – HLW Disposition Program Systems".
4. Citizens Advisory Board Recommendation No. 231 (adopted May 23, 2006), " Integrated Management Approach".
5. Citizens Advisory Board Recommendation No. 245 (adopted March 27, 2007), "Liquid Waste System Approach".

Agency Responses

Department of Energy-SR