Recommendation #266
Enriched Uranium Disposition

Background:

The Enriched Uranium Disposition (EUD) Project has been a successful ongoing project for the past few years [1]. This project involves the processing in H-Canyon of Highly Enriched Uranium formerly known as Off-Specification Uranium (HEU normally consists of uranium with more than 20% U-235 [2]; off-specification HEU results from the presence of large amounts of U-236 which act as a poison) and blending the HEU uranium to low-enriched uranium for use in commercial power plants. In addition to the Off-Specification HEU provided as input to the EUD Project, the project also will process aluminum-clad spent nuclear fuel recovered from the national Spent Fuel Program [3]. The HEU in the Off-Specification blending process involves approximately 7.5 metric tons (MT) of HEU and the Spent Fuel Program involves approximately 13.5 MT of HEU. The former blending process extends to the 2011 timeframe and the latter portion commences in 2011 and extends to 2019.

The Spent Fuel Program also plans to exchange fuel with Idaho such that the Savannah River Site (SRS) will receive aluminum-clad fuel, which it can process in exchange for the spent fuel it sends to Idaho which it cannot process (such as zirconium-clad fuel). While all this is underway SRS will be receiving, on a continuing basis, domestic spent fuel from across the United States and foreign spent fuel from around the world that the Department of Energy (DOE) is committed to receive and disposition.

In addition to the blend-down activity of the uranium in H-Canyon, the process interfaces indirectly with the Plutonium (Pu) Disposition Program at the same time that certain quantities of low quality Pu will be processed through H-Canyon for disposition in DWPF Canisters. This interface is indirect since different parts of H-Canyon facilities are used for Plutonium processing.

Comments:

The entire processing effort seems fairly complex with the interfaces from the varying types of HEU input for blending, and the indirect interface with the Pu Disposition Program. The EUD Program has been approved for the use of H-Canyon through 2019.

There appear to be several complicating factors that may increase operational uncertainties such as the potential delay in the Pu Disposition Program, the first time shipments of spent fuel out of L-Reactor Basin, the need for certain upgrades to the H-Canyon facilities, and the need to swap spent nuclear fuel with Idaho.

Since the 2019 date seems to be a significant target date for cessation of HEU processing, it would be useful to the CAB for SRS to describe the items that SRS considers on the critical path and the manner in which SRS is dealing with H-Canyon's operational uncertainties.

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Recommendations:

The SRS CAB requests that DOE provide by January 2010:

1. A schedule of the activities necessary to complete processing the Highly Enriched Uranium (HEU) in H-Canyon by 2019 to include projected costs on a yearly basis for the project. Further, identify the critical path(s) to complete the project. Include in the schedule all of the major uncertainties affecting the schedule such as the receipt of spent fuel near the HEU processing-end date of 2019 and other complicating factors that could delay the program.
2. Specific sub-schedules and additional supporting information, within the constraints of the applicable security requirements and considerations, for each of the items noted below:
    a. Shipments of aluminum-clad spent fuel from Idaho National Laboratory and the planned processing schedules at SRS.
    b. Shipments of aluminum-clad spent fuel from domestic reactors to SRS and the processing schedules at SRS.
    c. Shipments of aluminum-clad spent fuel from foreign reactors and the processing schedules at SRS.
    d. Shipments of zirconium-clad and other forms of spent fuel from SRS that SRS cannot process.
    e. The dependency of Plutonium processing and disposition on any of the HEU activities.
    f. The plan for modifications and up-grades to H-Canyon facilities to accommodate each of the above activities.
    g. A review of the Research and Development necessary for each processing activity above along with key milestones and projected and actual costs, if budgeted separately from the processing activities.
3. Critical paths and interfaces with other processes for each of the sub-schedules requested above including the identification of any potential problems that may have a major impact on planned costs and schedules.

References:

1. DOE News (2006, May 4): SRS makes 200th shipment of low enriched uranium retrieved 8/19/09 from www.srs.gov/sro/nr_2006/sr0601.htm
2. DOE Draft Report, retrieved 8/19/09 from ftp.fas.org/sgp/othergov/doe/heu/execsum.pdf; see also DOE Report UCRL-TB-133506 "Implementing HEU transparency measures, retrieved 8/19/09 from www.nti.org/e_research/official_docs/doe/mega_to_mega.pdf
3. NAS (2003) Improving the Scientific Basis for Managing DOE's Excess Nuclear Materials and Spent Nuclear Fuel. Washington, DC: National Academy Press.

Agency Responses

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