Summary of National Academies Committee Representatives' Observations on the FFRDC Working Meeting in Albuquerque, NM on October 16-17, 2018

A group of about ten FFRDC experts met in Albuquerque, NM, on October 16 and 17 to work on their analysis of alternatives for treatment of Supplemental Low-Activity Waste (SLAW) pursuant to the provisions of Section 3134 of the 2017 National Defense Authorization Act (NDAA). Three representatives of the National Academies' committee charged with reviewing the FFRDC's analysis were present to observe the meeting having no foreknowledge of the meeting content. The following summarizes the observations of the committee's representatives.

The purpose of the meeting was to focus on quantification of key attributes of the three main SLAW treatment alternatives and scenarios[1] within them based on elicitation of the views of the assembled FFRDC experts. However, the elicitation in this working meeting did not involve the Analytic Hierarchy Process (AHP) methodology, which was used during the May 1-3, 2018 expert elicitation, and the list of attributes being considered was considerably narrower than what was considered previously and documented in the FFRDC draft report and public meeting presentations in July 2018. The FFRDC team indicated they were using the results of the May 2018 expert elicitation as input to structuring the scenarios within the three alternatives (vitrification, grout, and steam reforming) prescribed in Section 3134 that were used in this meeting and will be compared in their forthcoming reports.

The team further stated that for this working meeting they focused on a subset of the 12 "variants" of the three primary alternatives described in their July 2018 report. The focus was on five "cases" (another term that they used): one for vitrification (disposal at the Integrated Disposal Facility (IDF) at Hanford), two for steam reforming (disposal at either IDF or Waste Control Specialists in Texas), and two for grout (disposal at either IDF or Waste Control Specialists). The important point is that the team is now apparently focusing on a handful of cases or variants for the purpose of developing a comparative analysis that could be useful for decision-makers.

Another important point is that the team expressly mentioned that it is not performing an exhaustive multi-branch event-tree analysis but instead is concentrating on potential major "causes" or adverse initiating events that could have significant effects on cost, schedule, and overall risk for each scenario considered.

A scenario is analyzed as follows:

1. The scenario is defined by a postulated adverse initiating event which may be common to all three alternatives and their cases/variants or be relevant to one of the alternatives; for example, Waste Treatment and Immobilization Plant (WTP) LAW treatment target throughput is not achieved in actual operation.
2. The FFRDC members were asked to rate the probability of occurrence using a five-step scale of VL (very low), L (low), M (medium), H (high), and VH (very high). The adopted rating was based on the consensus of the FFRDC members.
3. The FFRDC members then defined (a qualitative statement) one or more actions that might be taken to mitigate the cause and the probability that each mitigation measure would be successful on the five-step scale. The meeting began with a substantial list of scenarios and mitigation measures apparently based on the May 2018 meeting using the AHP methodology and unknown follow-up activities subsequent to this October 2018 meeting. But both were modified based on the discussions in this meeting.

[1] Team leadership openly acknowledged confusion concerning the nomenclature being used: alternatives, options, scenarios, variants, etc. and said they would be working to standardize the terminology.

4. The FFRDC members then defined separate qualitative statements of the mitigation measure consequences if the measure were successful and if the measure failed, and rated the cost of successful and unsuccessful mitigation on the five-step scale.
5. Associated with each step of the qualitative five-step scale are numerical ranges for cause probability (%), mitigation measure success probability (%), and cost consequences ($).
6. The probabilities and consequences are used to calculate the central estimate of cost risk ($) for the scenario.
7. Step 5 is then repeated to consider the effect of each consequence on schedule to yield a central estimate of schedule risk (years). The schedule risk seems to be designed to address the effect on milestones, and possibly the potential for degradation of equipment and facilities.
8. The team avoided double-counting for statistically dependent scenarios by defining conditional probability functions for those dependent scenarios' risk calculations.

The foregoing process was repeated for several pages of scenarios involving the three treatment alternatives, pre-treatment options, disposal options, causes external to SLAW, and regulatory and political impediments to populate what began as Excel spreadsheets that were mostly empty at the outset except as described in Step 3. There was no discussion of weighting or importance of the scenarios or causes, or how the results would be used to compare the alternatives and options. The committee does not have the completed spreadsheets containing the elicitation results, but hopes and expects the FFRDC team members will describe what they did and how it will be used in the November 29-30, 2018 public meeting.

It was understood that delays in the schedule necessarily result in substantial cost increases. In many cases the time when an obstacle arises has a significant effect on the length of the delay: if it arises during planning or construction it is likely to be less problematic than if it arises during production. In some cases the effect – or the likely mitigation measure – would be different if it arose soon after production began or some years later.

The Hanford tank waste treatment mission can progress at about half the desired rate without SLAW treatment. The treatment of the HLW defines the overall length of the mission; any scenario that affects HLW treatment can have a dramatic effect on the length of the mission—and consequently the costs.