

Critical Analysis Team Report

CAT Report #28

15 May 2002

The Critical Analysis Team (CAT) reviewed the Silos 1 and 2 Preliminary Design Package and, the week of May 13th, participated in a comment resolution meeting with Jacobs Engineering, Fluor Fernald, and DOE Fernald. This report outlines the CAT's 'high level' or most important comments resulting from this design review. The report also identifies the CAT's schedule commitments for future reviews of silos projects.

During the comment resolution meeting, the CAT was pleased with the interaction with Fluor Fernald and Jacobs Engineering. This meeting approach worked well and allowed resolution of many of the CAT's comments. Those comments that were resolved in draft form will not be forwarded as final comments. Rather, the CAT will continue to track the incorporation of draft comment responses.

High-Level Comments on the Silos 1 and 2 Preliminary Design Package.

1. **The Silos 1 and 2 Project should be developing and maintaining an 'action item' list.** Project success will rely heavily upon Fluor Fernald's ability to identify, track and resolve significant project issues. For many of the important systems design development (carts, fill head, etc.) is still relatively immature and will be developed through utilization of design-build contracts. This will require a significant procurement and integration management effort on the part of Fluor Fernald. Fluor must not underestimate the magnitude or importance of this task. Deferring design work to a vendor places a greater emphasis on Fluor's procurement, review and approval processes. This becomes especially important since many of the design deliverables are in their infancy (e.g. 19 out of 88 data sheets are complete; 0 out of 125 construction specifications are complete; 179 out of 548 drawings are complete).
2. **The Silos 1 and 2 Project must adequately plan and staff for responding to vendor submittals.** The large number of procurements will result in Fluor receiving, reproducing, distributing, controlling, reviewing and approving vendor submittals. Fluor Fernald must ensure it has adequate resources to manage the vendor submittal process, including support for timely responses. Moreover, Fluor Fernald should ensure that required submittals are linked to clear Fluor project management needs—requiring unnecessary submittals could lead to delays, claims and loss of project control.
3. **The Silos 1 and 2 Project should develop Interface Control Documents.** The Silo 1 and 2 facilities will have key interfaces among vendors, packages and with other projects (e.g. D&D, AWR, AWWT). Interface Control Documents should be developed for each interface project/entity ensuring adequate project integration.

4. **The Performance Grading system does not appear to add value.** Fluor's Performance Grading system appears to be an academic exercise that provide little, if any, added value. The process is arbitrary, subjective, and is unlikely to decrease a project's programmatic, health and safety or environmental risks. The CAT recommends ceasing the utilization of the Performance Grading system on the Silos 1 and 2 project.
5. **The Silos 1 and 2 Project should develop a Process Control, Sampling and Analysis Plan.** The current design does not reflect a coherent, needs-based sampling and analysis program. Without a treatment formulation, such a plan is understandably difficult to produce. Currently, the design requires extensive, but relatively undefined, sampling and analysis capabilities such as:
- Analyzing slurry for lead content (System Design Description, page 2-3, lines 40-43).
 - Analyzing for radium 226 (Systems Design Description, page 2-9, lines 28-29).
 - Analyzing the slurry for radiation (Systems Design Description, page 2-9, lines 36-37).
 - Product samples taken from the mixer (Systems Design Description, page 2-12, lines 16-17).

The recent treatability test results provide the project with data to complete the necessary Process Control, Sampling and Analysis Plan and incorporate the appropriate control, sampling and analysis activities into the design.

6. **Decisions on alternate disposal paths should be made as soon as possible.** The Nevada Test Site is currently the baseline disposal facility for Silos 1 and 2 waste. Alterations in the disposal path have the potential to impact the facility design. Therefore, if the project wishes to consider alternatives, a plan identifying actions, responsibility and decision points needs to be developed and implemented to ensure the issue is resolved expeditiously.
7. **The integrated systems test should ensure realistic operational testing of the entire container handling, filling and lidding systems.** Due to the integration challenge presented by the large number of vendors involved in the project's planned "remote" actions and activities, the integrated systems test will be particularly important in demonstrating system integration and capability.
8. **Safety documentation should be comprehensive and detailed.** In determining the facility's safety parameters, it does not appear that Fluor and Jacobs have considered all reasonable maintenance and off-normal operational scenarios in the ALARA and safety evaluations to ensure adequate protection of worker health and safety. Normally, this activity is performed in parallel with facility design, with the PSAR being provided at the completion of preliminary design and the FSAR at the completion of construction. The CAT looks forward to the June issuance of the PDSA and hopes it will resolve many of these issues.
9. **The operations and maintenance of the facility should be subjected to RAM and FMEA analyses.** Many of the processing times outlined for the facility are overly optimistic and not all maintenance requirements (e.g. access and off-normal operations) have been considered. These should be confirmed through a

practical RAM, FMEA and to ensure the facility is operable, maintainable and safe.

10. **The Preliminary Design Package is not sufficiently mature.** Traditionally, Preliminary Design reflects 60% design completion. However, many of the Silos 1 and 2 key systems (e.g. HVAC, Container, Container Cart, and lidding system) are at a very early stage of development. Worse, several key systems are currently being bid while others remain undeveloped. Managing design/build contracts for key systems at early and varying stages of development produces extremely difficult project management and integration challenges for the Silos 1 and 2 project.
11. **Fluor Fernald and Jacobs internal reviews should be more rigorous.** The preliminary design package contains many inconsistencies and mistakes that should be identified and resolved during the internal squad check reviews. An example of this is not only the Silos 1 and 2 Preliminary Design, but the Clarifier RFP (for which the CAT provided comments separately).

Proposed Future CAT activities

- AWR Balance of Plant Squad check (June 17-June 28) on following items: P&ID's, System Design Description, Rad Zone Drawings and ALARA analysis.
- AWR Mechanical Package (Sept. 17- Sept. 30) review and comment.
- AWR Remedial Design Package 'for information' review (June).
- Silos 1 and 2 RFP review 'for information' and design review and comment on the following elements:
 - Clarifier system
 - Tank Agitators (issue RFP May 17)
 - Product Mixers (issue RFP May 31)
 - Material Handling (issue RFP June 13)
 - Lidding Station (issue RFP June 13)
 - Fill Station (issue RFP June 13)
 - Bridge Crane (TBD)
 - Grappler (TBD)
- Review 'for information' Silo 3 Equipment Sheets specification package (originally scheduled to be April 30, currently TBD).
- Review 'for information' Silo 3 Buildings specification package (originally scheduled for April 15, currently TBD).
- Review and comment Silo 3 Mechanical Package Squad Check (originally week of May 13, now scheduled for May 29-June 6).