

## Critical Analysis Team Report

### CAT Report #26

13 February 2002

The CAT was recently informed the Silos project will be pursuing a new approach to completion of design for Silos 1 and 2 and Silo 3 projects. This new approach is in part intended to support a new baseline for completing the silos project in calendar year 2006.

The new approach consists of completing design through a number of construction and procurement packages that will be bid and awarded as individual contracts. This approach, known as "fast-tracking," carries with it both the possibility of acceleration and, if not managed properly, the risk of failure, delay and cost growth.

Following are issues that must be addressed in order to ensure success of the fast-tracked approach to silos projects.

**1) Projects should not conduct design activities without an approved basis and requirements document.** Currently, the Silo 3 basis and requirements document is not approved, placing the project at risk for the following pitfalls leading to an undisciplined design approach:

- Verbal work direction.
- Unilateral changes.
- Undocumented changes.
- Scope, schedule, and cost creep.
- Unauthorized work direction.
- Impulsive work direction.
- Inadequately reviewed, evaluated, and approved work direction.

**2) Proceeding directly from conceptual design to final bid packages is risky.** This approach reduces both the opportunity for, and the detail of, design reviews. It places a great burden on the importance of writing detailed, solid specifications. Also, this approach may attempt to inappropriately shift project risk to vendors.

**3) To credibly complete the designs in the form of packages, the projects must...**

- ...prepare individual baseline documents including cost estimate, schedule with interim measurable milestones, and scope of work.
- ...ensure that the Piping and Instrumentation Diagrams are complete and approved to support bid package development, construction and operation.

- ...review and approval of bid packages includes all appropriate disciplines. Of most importance for this approach is the approval of operations and maintenance.
- ...establish the project scope, schedule and cost baseline through a roll-up of individual package documentation.
- ...identify the drawings and specifications that will part of the scope of work of each package.
- ...ensure the combined individual packages drawings and specifications equate to the total project drawings and specifications.
- ...prepare each bid package as an independent project that includes an independent cost estimate, list of qualified bidders, bid review and acceptance process, and bidder submittal requirements, etc.
- ...identify all project and package interfaces and assign each project and package interfaces to a responsible individual.
- ...assign a person responsible for each package's management and completion.

**4) The silos project will have to ensure management mechanisms are in place to avoid the pitfalls posed by fast tracking. Fast tracking...**

- ...increases the pressure on all project participants to perform and meet schedules.
- ...requires early, careful, complete life-cycle package planning.
- ...demands close coordination amongst all project participants, package managers, and packages.
- ...requires design 'block-outs' and the added burden of managing these to completion.
- ...identification of all interfaces and careful planning and management of these interfaces.
- ...careful construction planning to avoid package interferences in terms of access, equipment, personnel, support staff, permits, and utilities.
- ...in-depth planning of acceptance testing, startup planning and turnover planning—on both the project and package levels.

To ensure that the silos project can be managed to success, management must address the above items. Toward that end, the CAT offers the following recommendations.

**Recommendation 25-1:** Fluor Fernald should revise the Engineering Execution Plan and the Project Execution Plan to support the current project direction.

**Recommendation 25-2:** The Silo 3 Design Basis and Requirements document should be approved.

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**Recommendation 25-3:** The Silos project should assign an individual responsible for each bid package.

**Recommendation 25-4:** The Silos project should develop and implement management mechanisms to ensure design packag integration and interface management (e.g. Inteface Control Document, procedures, memorandums of understanding).