

Analysis of Recommendations from EM and PM Reviews Performed in 2016-2017



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Project Peer Reviews (PPR) of capital asset projects are implemented in accordance with DOE O 413.3B, *Program and Project Management for the Acquisition of Capital Assets*. As described in the Order's Project Management Principles, PPRs should be utilized throughout the lifecycle of a project to appropriately assess project status, and make any corrections to project direction as needed. These reviews can be a useful tool for the Federal Project Director, senior site management and senior DOE management to provide confidence that a project is proceeding in accordance with contract requirements from both a technical and a programmatic point of view. Conversely, projects that are experiencing issues can benefit from an independent review with documented recommendations for correcting deficiencies as determined by qualified subject matter experts in the various disciplines of project management.

The Office of Project Management (EM 5.22) performs a review of the trends/lessons learned from peer reviews performed during the year. The purpose of the review is to provide EM management with information on issues and trends identified during these reviews in the areas of Project Management, Technical, Acquisition, Cost, Schedule, & Risk, and ESH&QA at project critical decision phases. The results from the EM Project Reviews Analyses report are identified below.

Discussion:

Background

The Department's ultimate objective is to deliver every project at the Project Performance Baseline on schedule, within budget, and fully capable of meeting mission performance, safeguards and security, quality assurance, and environmental safety and health requirements. Consistent with this objective, the Department conducts Project Peer Reviews (PPRs) and Independent Project Reviews (IPRs) in accordance with DOE order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*, to evaluate and ensure that EM projects meet DOE requirements.

These reviews are essential to maintain confidence that projects are effectively managed to meet all the regulatory and DOE management defined requirements. Reviews also provide peers and subject matter expert opinions and feedback on the project readiness to proceed to the next stage in the project decision-making process.

Discussion

Eighteen (18) IPRs and PPRs were conducted during FY2016 through FY2017, and data was collected and analyzed to identify trends and issues. Eleven (11) reviews were conducted by the EM Office of Project Management and seven (7) reviews were conducted by the Office of Project Management Oversight & Assessment. These 18 reviews of 22 projects were conducted at 10 EM sites, including Idaho, Oak Ridge, ORP, Richland, Savannah River, Portsmouth, Carlsbad, LBNL, ETPP and West Valley sites.

This analysis identifies the most prevalent issues within each of the five principal functional areas.

Management:

- Key documents (PEP, AS, etc.) had not been updated to reflect the latest project changes; PEP needs to be finalized and approved; the PPEP was not ready for approval due to missing, incomplete, and inconsistent elements; key documents required development, revision and/or formal approval (e.g. Safeguards, AS, PPEP, IPT Charter, IPT staffing analysis, etc.); project documents (PPEP, PSDR, PAS) did not contain dates or necessary approval signatures.

- A Project specific staffing analysis has not been performed; staffing analysis and oversight plan had not in place for the follow on phases of the project; gap between the current federal staffing requirement and the staff in place; staffing constraints led to conflicting priorities.
- FPD were not certified at the right level; FPD of appropriate level was not formally appointed; FPD had multiple competing assignments.

Acquisition:

- Acquisition Strategy was not approved nor developed properly (such as using one Acquisition Strategy to cover multiple Capital Asset Projects; the Acquisition Strategy was not aligned with the A-E contract or not aligned with the latest PEP.
- Challenges and delays in working through contract changes and/or negotiating these changes.

Cost, Schedule, and Risk:

- Risk Management Plans were not executed/followed; risk register had not been updated and/or required significant updates; the federal risk management plan and risk register were dated, not fully reflect transition from construction to commissioning and startup.
- Negative float, missing relationships, excessive durations existed in the schedule; critical path was not valid due to high float and inadequate schedule network; the schedule had not been updated to reflect project changes; and the schedule lacked sufficient detail; the baseline schedule is no longer reflected the current work.
- Cost estimates had not been updated after design evolution since CD-1 conceptual design to reflect changes as the technology and design mature.

ESH&QA:

- Staffing: IPT was missing functional areas, such as criticality safety, fire protection, and radiological protection and qualified personnel to support nuclear safety; offsite support in the safety and QA functional area needed to be identified; federal QA Division (QAD) functions are restricted by staffing shortfalls and lack of support contractors.
- Documented Safety Analysis (DSA): DSA did not address hazards associated with D&D activities or DSA did include discussion of the planned demolition activities in the next project phase.
- Safety Design Strategy (SDS): SDS was not revised in CD-2 before design activities substantively begun; or SDS needed to be revised to address potential upgrades to existing safety system components; SDS did not fully address seismic issues.

Additionally, the followings issues, were identified on at least one review; some of these are compliance issues.

- Formal QA oversight was not performed
- Requirements of DOE Order 425.1D, Readiness Reviews were not applied.
- Nuclear Material Control and Accountability (NMC&A) had not been identified.
- A formal Preliminary Documented Safety Analysis (PDSA) change control process was not developed.
- The Security Vulnerability Assessment was not revised to reflect changes as necessary
- New Protection Action Criteria (PAC) values were not reflected in the Hazards Analysis and the Emergency Planning Hazards Assessment (EPHA).
- QA oversight and procurement document review processes did not address major subcontractors.
- Procurement procedures did not include explicit requirements for the evaluation and approval of the vendor package prior to shipment; evaluation of the final item against final design verification; authorization or restrictions on subcontractors and suppliers performing commercial grade dedication.

Technical: Due to the uniqueness of the scope of each project, no common recommendations were identified among the different project reviews. However, the ones listed below did have significant impact on the projects.

- The design package was not revised to reflect detailed calculations, drawings, technical specifications, as well as Construction Quality Control comments.
- Key technical design basis documents (e.g. the System Functions and Requirements Document, Safety Design Strategy, etc.) had not been updated since early conceptual design flowsheet and operational strategy.
- The safety significant boundary in design were not well defined.
- Lack of configuration (coordination and integration) between designed systems.
- The Design Basis Document, Design Requirements Compliance Matrix, Interface Control Documents, and calculation documents had significant numbers of open items TBDs, unverified assumptions, etc.

Conclusion

The success of a project review depends on the value-added contribution it makes to improve project performance. It should be a collaborative process between the review team, the project team and EM senior management. EM Project reviews provide a second, unbiased assessment of EM project performance. Continuing on improving this important project management mechanism drives EM projects toward performance excellence.

Recommended Actions:

Lessons Learned:

Based on the above analyses, it is recommended that EM to take actions for improvements in the following major areas:

- **Staffing Analysis:** Perform staffing analysis to adequately address requirements throughout the project life cycle, especially for the Safety and Quality Assurance area. The data indicated that there often is a lack of resources to ensure adequate safety and QA oversight. Safety experts on a nuclear facility projects should include personnel in functional areas which relate to nuclear safety aspects of the facility. Disciplines within these functional areas can include: design disciplines (civil, structural, mechanical, electrical, instrumentation); health physics and radiological protection; safety, accident, hazard, or risk analysis; criticality safety; process chemistry; fire protection; configuration management; startup testing; conduct of operations; maintenance; operational readiness; commissioning; quality assurance.
- **Best Schedule Practice:** EM sites should conduct periodic training on project scheduling requirements, and follow the GAO Schedule Assessment guide. The project schedule provides not only a road map for systematic project execution but also the means by which to gauge progress, identify and resolve potential problems, and promote accountability at all levels of the project. Moreover, the schedule is an essential basis for managing tradeoffs between cost, schedule, and scope. Among other things, scheduling allows management to decide between possible sequences of activities, determine the flexibility of the schedule according to available resources, predict the consequences of managerial action or inaction in events, and allocate contingency plans to mitigate risk.
- **Risk Management:** Effective risk management strategies allow a project to identify project's strengths, weaknesses, opportunities and threats. Maintaining an up to date risk register enables the FPD to view and manage risk management progress and ensure that important risks are addressed and have mitigation approaches included. Additionally, the Risk Management Plan needs to be updated before each critical decision approval.

Critical Decision(s): CD-0 to CD-4

Facility Type(s): All

Work Function(s): Project/Program Management

Technical Discipline(s): All

References:

1. DOE Order 413.3B Change 5, *Program and Project Management for the Acquisition of Capital Assets*
2. EM Project Reviews Analyses, prepared by Project, Time & Cost for EM-5.22, Office of Project Management, dated August 30, 2017.