Best Practice #161

Title: Baseline Change Proposals and Contingency

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Brief description of Best Practice: To successfully manage project complexity and risk, the U.S. Department of Energy (DOE) and the National Nuclear Security Administration (NNSA) have developed processes and tools that, when used properly, will accurately baseline projects and adapt to changes during project execution. Two of these tools are: 1) Baseline change control, which is used to manage and implement changes during project execution; and 2) Contingency, which provides for managing risk and uncertainty. (Contingency is formed of two elements: DOE-held Contingency, and contractor-held Management Reserve [MR].) Baseline Change Proposals (BCPs) and Contingency/MR are applied inconsistently on DOE and NNSA projects. The Best Practice, and paper from which it was developed, communicates their concepts, requirements, best practices, and recommendations to improve project performance.

The overall recommendation is that DOE, NNSA, and the contracting community develop a common understanding and consistent use of the same processes. Joint training should be conducted (with DOE, NNSA, and contractors) to ensure a common understanding of requirements and application. DOE requirements, guidance, and definitions should be strengthened and clarified. For example, at some DOE sites (for projects executed by Management and Operations [M&O] contractors), overall Contingency is estimated as part of a risk-based process and MR is segmented and allocated to the control of the contractor, based on ownership of risks and/or other factors. At other sites, DOE either does not allow the use of MR or controls MR as it would DOE-held Contingency. Further, differences exist between the use and implementation of Contingency/MR and BCPs on projects executed under Federal Acquisition Regulation (FAR) Part 15 vs. those executed under M&O contracts. Projects executed under traditional FAR Part 15 contracts have different and more complex pricing and estimating requirements; thus, confusion exists due to differing expectations between DOE and the contractors. DOE, NNSA, and the contracting community need to follow consistent definitions and requirements throughout the DOE Complex.

Why the Best Practice was used: Although DOE provides detailed requirements and guidance on the development and implementation of BCPs and Contingency, inconsistent and confusing terminology, interpretation, and implementation of these tools can lead to confusion, which costs time and money, and threatens project success. BCPs take too long to develop, process, and approve. BCPs have the dual purpose of making adjustments that do not change the project baseline, as well as those that modify the baseline. This dual purpose and terminology can cause confusion in implementation. BCPs are often inefficient and fail to fulfill the fundamental function of establishing a cost and schedule baseline efficiently.

Similarly, Contingency and MR are often misapplied and misunderstood, leaving projects without an effective method of managing in-scope changes and risk. Lack of effective BCP and Contingency/MR implementation has a deleterious effect on DOE project performance; results in misalignment between project and contract baselines; leads to increased cost (and risk); and diminishes DOE's and contractors' credibility and ability to manage their project portfolios.

What are the benefits of the Best Practice: Best industry practices could be employed to shorten and streamline the BCP process. For example, at some sites, 20-30 different signatures and approvals are required to gain approval, which can take several months. By the time BCPs are approved, circumstances have often changed so much that the BCP is obsolete, and the process must start again. Frequently, work continues with no means to accurately measure performance. Streamlining and simplifying the BCP process would

minimize rework and reduce management cost and effort. Through improved communication, clear requirements and guidance, and joint training, the change management process can be improved, enabling the contractors and DOE and NNSA to better manage projects.

Similarly, a clear understanding of Contingency/MR and their appropriate usage will facilitate project management that is more consistent with industry practices.

What problems / issues were associated with the Best Practice: DOE Guide G 413.3-20 provides a thorough description of the baseline change control process, including the differences between M&O and traditional FAR Part 15 and non-M&O contracts. However, in many cases DOE is inconsistent in how they apply change control requirements, which has driven contractors to invent new processes to implement them. The following are examples of issues related to BCPs observed at many DOE / NNSA sites that ultimately lead to improper or inefficient execution:

- Development of BCPs: 1) BCPs are used to control in-project and within baseline changes, and also to incorporate out-of-scope changes. However, there is no differentiation between these two types of BCPs; 2) There is not a clear definition on the level of detail that needs to be in a BCP before it goes into the approval phase; 3) Methods used to develop BCPs are inefficient, in that input is usually gathered from project team members individually and then pieced together: 4) Confusion exists on the difference between budget [Budget at Completion (BAC) in the Performance Measurement Baseline (PMB)], and funding drives improper use of BCPs. For example, BCPs have been used to remove budget [Budgeted Cost of Work Scheduled (BCWS)] from an underrun control account because that action appeared to free up funding for additional work scope.
- Approval of BCPs: 1) BCPs are usually approved by officials "in series," creating multiple comment incorporation loops and thus creating needless delays; 2) Approval levels are frequently higher in practice than are required. BCPs for scope that is within the Contract Budget Base (CBB) and will be funded by MR (only requiring contractor PM approval); 3) Cycle-time expectations for BCP approval and implementation generally are not established by DOE or the contractor, so the process tends to drag out.
- Implementation of BCPs into Earned Value Management System (EVMS) software: Entering BCPs into software tools is technically difficult. BCPs "stack up," which further increases the difficulty. Approval cycles are not sensitive to the fact that often BCPs must be entered in the same sequence that they were developed.

With respect to Contingency, there is little written guidance describing how, when, and if the Contingency from a cost estimate is apportioned between MR and DOE-Held Contingency, following approval of the estimate, for projects acquired under M&O contracts—especially in instances where DOE does not allow the contractor to develop a risk-based MR. Inconsistencies in how MR and Contingency amounts are initially determined are a direct cause of improper approval of allocations to the PMB later in the process. Further guidance on the division of ownership risk (rather than just on dollar thresholds) would be helpful. For example, risks associated with design evolution within the scope of the CBB should be owned by the M&O contractor and have MR associated with them. Technical and Programmatic Risks (TPRA) should be owned by DOE and have an associated Contingency amount. This would be consistent with DOE G413.3-7a, Attachment 11; however, this practice has not been widely adopted.

The vast majority of difficulties with management of MR and Contingency appear to result from implementation of flawed processes on projects (which are inconsistent with required processes), rather than inadequate definition of the processes. There is a large gap between the processes and methodologies defined in DOE guidance and the processes that are actually in place on most projects. This misapplication of MR needlessly eliminates the M&O

contractor's ability to manage work within the CBB, and adds costly inefficiencies to project management. There are also numerous cases where there is no differentiation between MR and Contingency, resulting in improper utilization. For example, MR may be applied to new project scope, or Contingency may be used for in-scope events if there is no remaining MR.

How the success of the Best Practices was measured: BCP success and progress are primarily measured by cycle time from inception through approval and implementation such that the change is made expeditiously and approval times do not unnecessarily hinder the schedules of successor activities (e.g., engineering, construction, startup, etc.).

Success of Contingency and MR are primarily measured when DOE/NNSA and Contractor personnel interpretation and implementation are consistent with one another, and with DOE requirements. Further, success is measured when such interpretations survive changes in management personnel on projects.

Description of process experience using the Best Practice: A summary of the process for best BCP pratices are as follows:

- Reserve BCPs for events that change the Performance Baseline (PB), Total Project Cost (TPC), and/or other material aspect of the project.
- Develop separate categories and appropriate designations for various changes:
    - BCP – changes to the TPC requiring Congressional approval
    - CA – Contingency Allocation requiring DOE/NNSA approval, per the PEP
    - BCA – Budget Change Authorization for internal changes to control accounts including transfer of MR and UB to control accounts (contractor approval only)
- Implement training and engage senior leadership at each site (DOE/NNSA and contractor). Improve communication and come to agreement on the process.
- Determine consistent approval thresholds, terminology, and related amongst PEPs at each site.
- Consider utilizing other techniques such as: 1) A Pre-Change Control Board (CCB) Meeting to discuss and agree on basic BCP usage and content before formal request; 2) Blue Team Meeting – inform DOE of BCPs for next CCB; 3) Execution of Authorized Unpriced Work (AUW) – develop a mechanism to allow for execution of work that is required but not fully negotiated yet so that AUW can be tracked in the EVMS; 4) In the PEP, ensure that the minimum approval authorities are defined so that approval processes can be streamlined as much as possible.

For Contingency and MR, best practices are implemented through the following basic processes:

- Improve definitions and terminology. Although MR and Contingency are defined in the DOE documents, improvements and better coordination between various documents are recommended. to better and more precisely communicate on topics that are often confusing, and where acronyms and terminology are used interchangeably but have different meanings.

- Improve guidance on Development of MR and DOE-Held Contingency. There is little written guidance describing how, when, and if the Contingency from a cost estimate is apportioned between MR and DOE-Held Contingency, following approval of the estimate, for projects acquired under M&O contracts. Guidance documents should be revised to better define and improve consistency. Inconsistencies in how MR and Contingency amounts are initially determined are a direct cause of improper approval of allocations to the PMB later in the process. Further guidance on the division of ownership risk (rather than just on dollar thresholds) would be helpful. For example, risks associated with design evolution within the scope of the CBB should be owned by the M&O contractor and have MR associated with them. Technical and Programmatic Risks (TPRA) should be owned by DOE and have an associated Contingency amount. This would be consistent

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- Utilize Industry Guidance and Best Practices, such as those from the American Association of Const Engineering, International and the American Society of Professional Estimators.
- Improve communication and implement joint DOE/Contractor training.