

U.S. Department of Energy
Washington, D.C.

ORDER

DOE O 413.3C

Approved: 08-05-2026

**SUBJECT: PROGRAM AND PROJECT MANAGEMENT FOR THE ACQUISITION OF
CAPITAL ASSETS**

1. PURPOSE.

- a. To provide the United States (U.S.) Department of Energy (DOE) elements, including the National Nuclear Security Administration (NNSA), with risk-informed program and project management direction for the acquisition of capital assets with the goal of delivering projects within the original performance baseline (PB), cost and schedule, and fully capable of meeting mission performance, safeguards and security, and environmental, safety, and health requirements unless impacted by a directed change.
- b. To implement Office of Management and Budget (OMB) Circulars to include A-11, and its supplement, “Capital Programming Guide,” which prescribes new requirements and leading practices for project and acquisition management;
- c. A-123, “Management’s Responsibility for Enterprise Risk Management and Internal Control,” which defines management’s responsibility for internal control in federal agencies; and A-131, “Value Engineering,” which requires that all federal agencies use value engineering (VE) as a management tool.

2. CANCELLATION. This Order cancels DOE Order (O) 413.3B, Chg. 7, *Program and Project Management for the Acquisition of Capital Assets*, dated June 21, 2023. Cancellation of a directive does not, by itself, modify or otherwise affect any contractual or regulatory obligation to comply with the directive. Contractor Requirements Documents (CRDs) that have been incorporated into a contract remain in effect throughout the term of the contract unless and until the contract is modified to either eliminate requirements that are no longer applicable or substitute a new set of requirements.

3. APPLICABILITY.

a. Departmental Applicability.

The requirements identified in this Order are mandatory for all DOE elements (unless identified in paragraph 3.c., Equivalencies/Exemptions) for all capital asset projects having a total project cost (TPC) greater than the minor construction threshold or \$50 million (whichever is higher), except that during the project development phase, Under Secretaries may reduce the threshold for nuclear projects, complex first-of-a-kind projects, or other projects with specific program guidance.

Any reference to a Program Secretarial Officer (PSO) in this Order is also applicable to the Deputy Administrator/Associate Administrators for the NNSA.

The project management principles [see Appendix C, Paragraph 1], as set forth in this Order, apply using a tailored approach to all capital asset projects \$50 million and below inclusive of minor construction projects [also referred to as general plant projects (GPPs)].¹

All projects with a TPC greater than the minor construction threshold or \$50 million, whichever is higher, are required to report progress and provide documentation in the Project Assessment and Reporting System (PARS) at Critical Decision (CD)-0 and thereafter, in accordance with Appendix C. After CD-2 is approved, earned value reporting shall apply.

This Order does not apply to financial assistance awards (grants and cooperative agreements) covered under 2 Code of Federal Regulations (CFR) §§ 200, Office of Management and Budget Guidance, and 910, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, and 10 CFR § 600, Assistance Regulations (legacy awards), or to energy savings performance contracts (ESPCs) as referenced in 48 CFR § 23.205, Energy savings performance contracts.

The Administrator of NNSA will ensure that NNSA employees and contractors comply with their respective responsibilities under this Directive. Nothing in this Order will be construed to interfere with the NNSA Administrator's authority under Section 3212(d) of Public Law (P.L.) 106-65, National Defense Authorization Act for Fiscal Year 2000, to establish Administration-specific policies, unless disapproved by the Secretary.

b. DOE Contractors.

Except for the equivalencies/exemptions in paragraph 3.c., the CRD (Attachment 1) sets forth requirements of this Order that will apply to contracts that include the CRD.

The CRD must be included in all contracts that make the contractor responsible for planning, design, construction and execution of capital asset projects subject to this Order.

¹ The minor construction threshold stated in 50 U.S.C. § 2741(2) was \$30 million as of the release of DOE O 413.3B, Chg. 7. Also reference 50 U.S.C. § 2743(e).

- c. Equivalencies/Exemptions/Delegations. Equivalencies and exemptions to this Order are processed in accordance with DOE O 251.1, *Departmental Directives Program*, current version. Central Technical Authority (CTA) (or designee) concurrence is required for both exemptions and equivalencies to this Order for nuclear facilities. The Deputy Secretary must approve all equivalencies and exemptions to the requirements delineated in this Order except for those stipulated in Paragraphs 3.c.(3)–(5).
- (1) Equivalency. In accordance with the responsibilities and authorities assigned by Executive Order (EO) 12344, Naval Nuclear Propulsion Program, codified at 50 United States Code (U.S.C) § 2406, Deputy Administrator for Naval Reactors, and 10 U.S.C § 6102, Naval Nuclear Propulsion Program, and to ensure consistency through the joint Navy/DOE Naval Nuclear Propulsion Program, the Deputy Administrator for Naval Reactors (Director) will implement and oversee requirements and practices pertaining to this Directive for activities under the Director's cognizance, as deemed appropriate.
 - (2) Equivalency. Bonneville Power Administration in accordance with Secretarial Delegation Order 00-033.00B, dated July 20, 2009.
 - (3) Exemption—Specific Capital Asset Project. For PSOs that are not exempt as defined in paragraph 3.c.(4) of this Order, the Programs may present cases to the Project Management Risk Committee (PMRC) for a specific project to have an exemption from a specific Order requirement. If the consensus of the committee is to endorse the exemption request, approval of the exemption request will be made by the appropriate Under Secretary. However, if consensus cannot be attained, at the discretion of the Program, the exemption request may be forwarded to the Deputy Secretary as the Chief Executive for Project Management (CE) with formal review by the PMRC outlining the advantages and disadvantages of the proposed exemption. In this case, the exemption request will be entered into, and processed through, the Department's formal collaboration process.
 - (4) Exemption. PSOs that meet all of the following criteria may be excluded from specific requirements of this Order. The intent of this exemption is to shift CD authority to the PSO and place those activities normally carried out by the DOE Office of Project Management (PM) in the hands of the Project Management Support Office (PMSO). They must have:
 - An established PMSO with adequate project management requirements, processes and procedures defined to enable continued project success. This will be validated by PM and must be consistent with the Acquisition Management System delineated in the Order;
 - An ongoing set of active capital asset projects, post-CD-2, of over five projects at any time during the current fiscal year (FY); and

- Completed 90% of projects across a 3-year rolling average, not to exceed by more than 10% of the original cost and schedule baselines for the original approved scope at CD-2 for all capital asset projects with a TPC greater than the minor construction threshold or \$50 million, whichever is higher.

To allow determination of Departmental-wide metrics and to permit an independent validation of the PSO eligibility to exercise this exemption, all PSOs are still required to:

- Report all projects into PARS monthly, when applicable.
- Submit all CD or equivalent documents to PM.
- Submit Performance Baseline Change Proposal approvals to PM.

Independent Cost Reviews and/or Independent Cost Estimates will be performed as delineated in Appendix A, Tables 2 through 4.

For PSOs that are eligible for the exemption, the Deputy Secretary must take affirmative action and approve the exemption through an action memorandum from the PSO with concurrence from PM. The Deputy Secretary may specify exceptions (e.g., retain high profile projects).

Additionally, the nuclear safety-related requirements of the Order including DOE-Standard (STD)-1189-2016, *Integration of Safety into the Design Process*, shall not be exempted. Further, this exemption does not apply to defense nuclear facilities.

The Deputy Secretary shall rescind this exemption if the PSOs are unable to maintain the exemption requirements listed previously. The exemption may also be rescinded at any time at the discretion of the Deputy Secretary.

- (5) Delegation. For national laboratories, sites, or plants managed under Management and Operating (M&O) contracts, project authority can be delegated to the M&O contractor for capital asset projects with a TPC less than \$300 million. Delegated projects must follow sound project management principles. The M&O contractor shall provide the cognizant Program Office with the equivalent of a project execution plan (PEP), key performance parameters, and progress milestones based on the complexity and risk of the project. Based on relatively low risk and demonstration of sustained successful project execution, capital asset projects, including standard commercial construction, with a TPC greater than \$300 million may also be delegated to the M&O contractor with Project Management Executive (PME) approval.

The decision to delegate project authority should be made after consideration of the TPC, PEP (or equivalent), and the project complexity and risk level, and should be delegated in writing to the M&O contractor by the PME.

- (6) When a PSO is no longer exempt, the requirements of this Order must be implemented within 6 months. Specifically, projects reaching a particular CD or project closeout within 6 months of exemption rescission are not required to comply with this Order for approval of that CD. Those reaching a CD after 6 months of exemption rescission shall comply with this Order to gain approval of that particular CD or for project closeout.

4. REQUIREMENTS.

a. General.

- (7) Project management guiding principles and requirements are provided in Appendix A. Detailed requirements on capital asset projects are provided in this Order. All projects, with the exception of demolition projects performed by the Office of Environmental Management (EM), follow Appendices A, B and C. For demolition projects performed by EM, Appendix D replaces Appendix A and modifies applicable elements in Appendices B and C.
- (8) Guides are not requirements documents and are not to be construed as requirements in any audit or appraisal for compliance with the parent Policy, Order, Notice, or Manual. The Guides referenced in this Order are meant as suggestions or potential guidelines for content and purpose of documents. Guides relevant to topics in this Order are available on the DOE Directives website: <https://www.directives.doe.gov/guidance>.

Tailoring is necessary for the efficient delivery of projects and should be applied to all projects considering size, scope, complexity, cost, and risks. Tailoring does not imply the omission of requirements, and requirements must be addressed to the extent necessary and practical. Tailoring may involve consolidation or phasing of CDs, substituting equivalent documents, using a graded approach to document development and content, concurrency of processes, or creating a portfolio of projects to facilitate a single CD or acquisition strategy (AS) for the entire group of projects.

Tailoring may also include adjusting the scope of independent project reviews (IPRs) and external independent reviews (EIRs), delegation of acquisition authority, and other elements. Major tailored elements such as consolidating or phasing CDs or delegation of Project Management Executive (PME) duties must be specified in the PEP or the tailoring strategy and approved by the PME. For Hazard Category 1, 2, and 3 nuclear facilities, the tailoring strategy must include the approach to satisfying DOE-STD-1189-2016 safety document development. See Appendix C.

- b. Implementation. The requirements in this update must be implemented immediately upon issuance of this Order. Programs are not required to revisit previously achieved critical decisions.

5. RESPONSIBILITIES. Key roles and responsibilities of line managers are described in Appendix B.
6. INVOKED STANDARDS. The following DOE technical standards and industry standards are invoked as required methods in this Order in accordance with the applicability and conditions described within this Order. Any technical standard or industry standard that is mentioned in or referenced by this Order, but is not included in the list below, is not invoked by this Order. Note: DOE O 251.1, current version, Appendix J, provides a definition for “invoked technical standard.”
 - a. DOE-STD-1189-2016, *Integration of Safety into the Design Process*. This DOE technical standard is required to be used for development and integration of safety analysis and supporting design for new nuclear facilities and applicable modifications. See Appendix A and Attachment 1 for specific requirements.
 - b. DOE-STD-1073-2016, *Configuration Management*. This DOE technical standard is required to be used in the establishment of a configuration management process for new nuclear facilities and applicable modifications. See Attachment 1, Section 9 for specific requirements.
 - c. DOE-STD-1104-2016, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*. This DOE technical standard is invoked by DOE O 420.1, *Facility Safety*, current version, and therefore treated as a requirement in this Order for DOE review and approval of safety basis and safety design-basis documents for nuclear facilities.
7. DEFINITIONS. See Attachment 2. See Attachment 3 for acronyms.
8. REFERENCES. See Attachment 4.
9. CONTACT. Questions concerning this Order should be directed to PM, pmpolicy@hq.doe.gov.

BY ORDER OF THE SECRETARY OF ENERGY:



JAMES P. DANLY
Deputy Secretary

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APPENDIX A REQUIREMENTS

1. Objective.

The Department's ultimate objective is to deliver every project at the original performance baseline (PB), on schedule, within budget, and fully capable of meeting mission performance, safeguards and security, quality assurance (QA), sustainability, and environmental, safety, and health requirements. Consistent with this objective, a project shall be completed at Critical Decision (CD)-4 within the original approved performance baseline (CD-2), unless otherwise impacted by a directed change. The execution of these objectives will likely require tailoring depending on the characteristics of the respective project.

The authority and accountability for any project, including its costs, must be vested firmly in the hands of the Federal Project Director (FPD).

Some cost estimate, or cost range, should be provided at each CD gateway, but the degree of rigor and detail for a cost estimate should be carefully defined, depending on the degree of confidence in project scale and scope that is reasonable to expect at that stage. Whatever figure or range that is provided should explicitly note relevant caveats concerning uncertainties inherent in estimates at CD-0 and CD-1 stages.

A project owner should never be the sole cost estimator, at any stage (i.e., from CD-0 on), given the inherent conflict of interest.

The second cost estimator should come from outside of the line manager's chain of command, to avoid conflict of interest.

2. Department of Energy (DOE) Acquisition Management System.

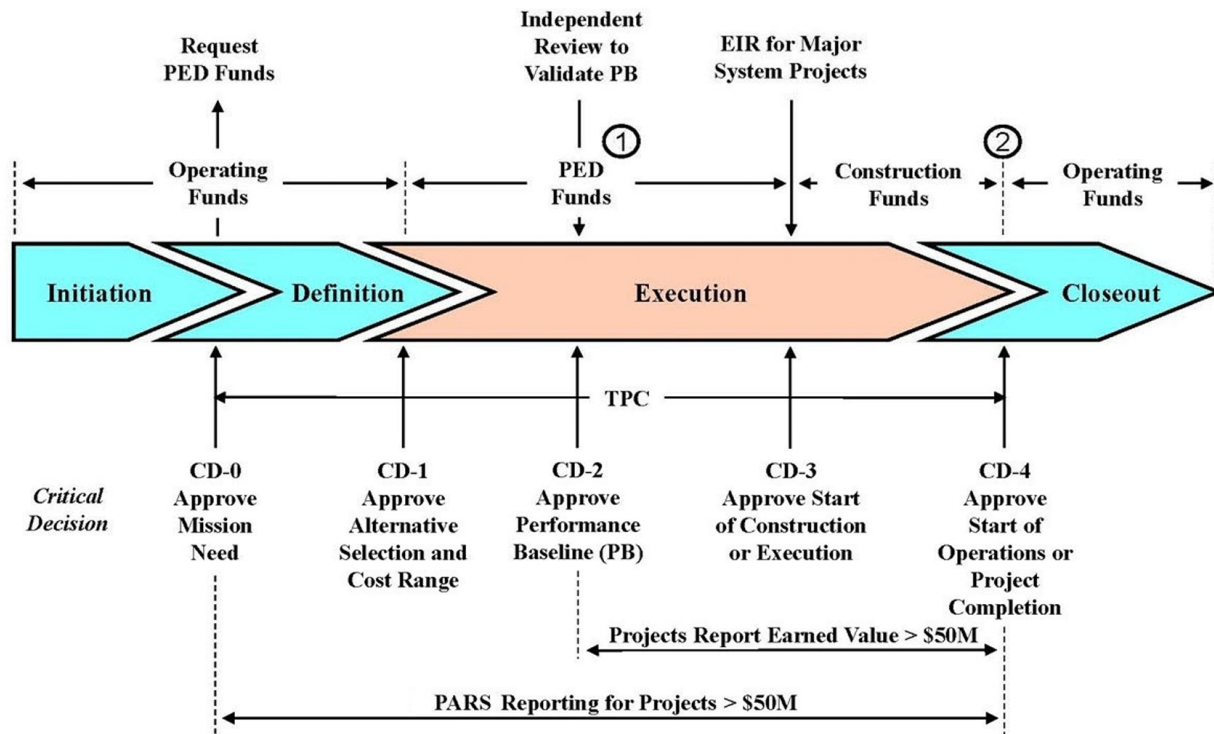
The DOE Acquisition Management System establishes principles and processes that translate user needs and technological opportunities into reliable and sustainable facilities, systems, and assets that provide a required mission capability. The system will be organized by project phases and CDs, progressing from broadly stated mission needs into well-defined requirements resulting in operationally effective, suitable, and affordable facilities, systems, and other products.

Within DOE, projects typically progress through five CDs, which serve as major milestones approved by the Chief Executive for Project Management (CE) or Project Management Executive (PME). Each CD marks an authorization to increase the commitment of resources by DOE and requires successful completion of the preceding phase or CD. The amount of time between decisions will vary. The CDs are:

- CD-0, Approve Mission Need. There is a need that cannot be met through other than material means.
- CD-1, Approve Alternative Selection and Cost Range. The selected alternative and approach is the optimum solution.

- CD-2, Approve Performance Baseline. Definitive scope, schedule, and cost baselines have been developed.
- CD-3, Approve Start of Construction/Execution. The project is ready for implementation.
- CD-4, Approve Start of Operations or Project Completion. The project is ready for turnover or transition to operations, if applicable.

Figure 1 illustrates the requirements for the typical implementation of the DOE Acquisition Management System for line-item capital asset projects. Figure 2 depicts the implementation for other capital asset projects such as major items of equipment (MIE) and operating expense (OE) projects. When project design scope meets maturity and risk acceptance thresholds, risk-informed permanent plant construction (CD-3X for work such as concrete placement, structural steel installation, etc.) is allowed prior to CD-3 approval with concurrence from the DOE Field/Site Office or PME.



NOTES:

1. PED funds can be used after CD-3 for design.
2. Operating Funds may be used prior to CD-4 for transition, startup, and training costs.

Figure 1: Typical DOE Acquisition Management System for line-item capital asset projects

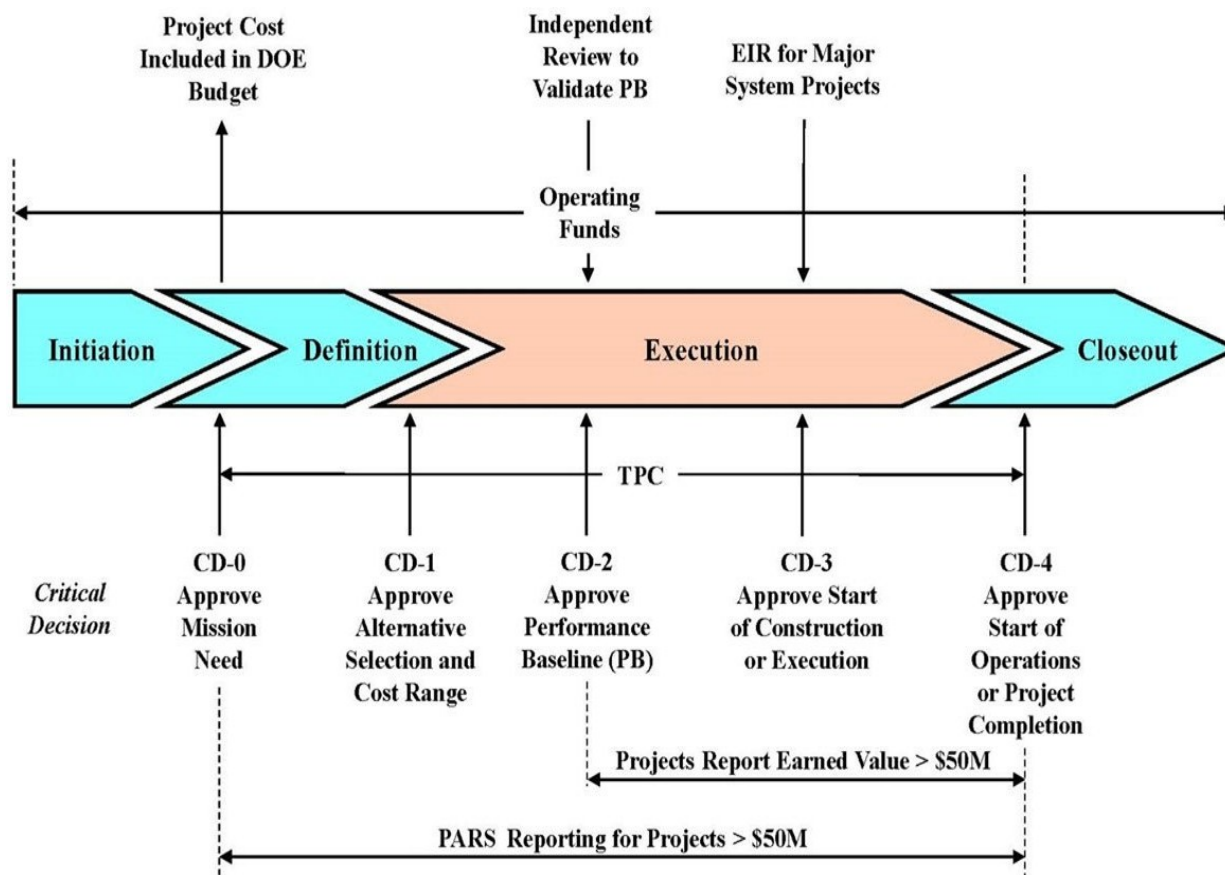


Figure 2: Typical DOE Acquisition Management System for other capital asset projects (i.e., major items of equipment and operating expense projects)

3. CD Approval Authority and Thresholds.

The Deputy Secretary serves as the Department's CE and promulgates Department-wide policy and direction. The CD authorities, thresholds and delegations are identified in Table 1.

- a. Major System Projects. Projects with a total project cost (TPC) greater than or equal to \$1 billion are major system projects. All major system project CDs must be proposed by the appropriate PSO and approved by the Deputy Secretary as DOE's designated CE before proceeding to the next project phase or CD.
- b. Non-Major System Projects. Projects with a TPC less than \$1 billion are non-major system projects. The designated PME must approve all non-major system project CDs, except for CD-0, which cannot be delegated below the PSO.

Table 1: CD Authority Thresholds

Critical Decision Authority	Total Project Cost Thresholds
Deputy Secretary	≥\$1 billion (or any project on an exception basis when designated by the Deputy Secretary) Further delegation is allowed.
Under Secretaries	≥\$300 million and <\$1 billion (or any project on an exception basis when designated by the Under Secretaries) Further delegation is allowed.
Program Secretarial Officer	>Minor Construction Threshold or \$50 million (whichever is higher) and <\$300 million Further delegation is allowed.

4. Requirements for Approval of Critical Decisions.

a. CD-0, Approve Mission Need.

The initiation phase begins with the identification of a mission-related need. A Program Office will identify a credible performance gap between its current capabilities and capacities and those required to achieve the goals articulated in its strategic plan. The mission need statement is the translation of this gap into functional requirements that cannot be met through other than material means. It should describe the general parameters of the solution and why it is critical to the overall accomplishment of the Department's mission, including the benefits to be realized. The mission need is independent of a particular solution, and should not be defined by equipment, facility, technological solution, or physical end-item. This approach allows the Program Office the flexibility to explore a variety of solutions and not limit potential solutions (refer to DOE Guide (G) 413.3-17, *Mission Need Statement*, current version). Table 2 lists the requirements needed to attain CD-0.

The cost range provided at CD-0 should be rough-order of magnitude (ROM) and is used to determine the PME authority designation. It does not represent the PB, which will be established at CD-2.

The project name defined at CD-0 approval, in consultation with program budget staff, will be used to establish the project record in PARS, and on all project documentation and project data sheet (PDS) submittals. The project name will remain the same for the life of the project unless Congressional action requires a name change.

Line-item construction projects are appropriated project funds at either the total estimated cost (TEC) or TPC level.

Table 2: CD-0 Requirements¹

Prior to CD-0	Approval Authority ²
Perform pre-conceptual planning activities that focus on the Program Offices' strategic goals and objectives, safety planning, design, development of capability gaps, high-level project parameters, a ROM cost range, and schedule estimates.	
Perform a mission validation independent review on all major system projects. (Refer to DOE G 413.3-9, current version.)	PSO
Approve a mission need statement document with recommendation from the Office of Project Management (PM) for projects with a TPC $\geq$ \$300 million. (Refer to DOE G 413.3-17, current version.)	PSO
For major system projects, or for projects as designated by the CE, PM will conduct an independent cost review (ICR).	
For major system projects, the Project Management Risk Committee (PMRC) will review and analyze the CD and make recommendations to the Energy Systems Acquisition Advisory Board (ESAAB), CE, or PME, as applicable, before approval.	CE $\geq$ \$1 billion
For NNSA only , prepare a program requirements document that defines the ultimate goals which the project must satisfy. (Refer to National Nuclear Security Administration [NNSA] Business and Operating Policy.)	PSO
For Hazard Category 1, 2, and 3 nuclear facilities , and to the specificity possible, document DOE expectations for safety-in-design. (Refer to DOE-STD-1189-2016.)	Safety Basis Approval Authority (SBAA)
Post-CD-0 Approval	
Submit all CD documents to PM.	
Develop a project data sheet (PDS) for line-item projects to request project engineering and design (PED) funds. Develop funding documents for MIE or OE projects for the design, and Office of Management and Budget A-11, Business Cases. (Refer to DOE Chief Financial Officer (CFO) budget call for PDS and business case template.)	
Initiate monthly PARS reporting (excluding earned value data). FPD, program manager, and PM will provide monthly assessments, as appropriate.	
Initiate quarterly project reviews (QPRs) with the PME or their designee.	
Conduct a project peer review of active projects when the top-end range is \$300 million or greater.	
Proceed with conceptual planning and design used to develop alternative concepts and functional requirements using operating funds.	
NOTES: - Documents and reports are not intended to be and may be combined. - Where no approval authorities are noted, authorities are established through other directives or the Program Offices (e.g., Functions and Requirements Assignment Matrix). - Title 10 CFR §830 does not apply to accelerators and their operations.	

- b. CD-1, Approve Alternative Selection and Cost Range. CD-1 approval marks the completion of the project definition phase and the conceptual design. This is an iterative process to define, analyze, and refine project concepts and alternatives. This process uses a systems engineering methodology that integrates requirements analysis, safety strategies, risk identification and analysis, acquisition strategies, and concept exploration in order to evolve a cost-effective, preferred solution to meet a mission need (refer to DOE G 413.3-1, current version, for more information). The recommended alternative should provide the essential functions and capabilities at an optimum life-cycle cost, consistent with required cost, scope, schedule, performance, and risk considerations. It should be reflected in the site's long-range planning documents as well. Approval of CD-1 provides the authorization to begin the project execution phase and allows PED funds to be used. Table 3 lists the requirements needed to attain CD-1.

For each project, the appropriate Under Secretary will designate a project owner. Each Under Secretary will also establish a clear line of functional responsibility that extends from the Under Secretary through the project owner and to the FPD. This shall be documented in the preliminary project execution plan at CD-1.

The cost range provided at CD-1 is the preliminary estimate for the selected alternative. As CD-1 progresses to CD-2, the TPC will be refined and the TPC established at CD-2 may be higher than the range defined at CD-1, in which case the PME must be notified. The CD-1 cost range is not the PB cost. The PB against which project success is measured will be established at CD-2. The only exception is when a construction budget request is submitted in advance of an approved CD-2. In this circumstance, refer to Appendix A, paragraph 4.c.(2).

If the top end of the original approved CD-1 cost range grows by more than 50% as the project proceeds toward CD-2, the program, in coordination with the PME, must reassess the alternative selection process. Upon completing the review, the PME must approve a revised CD-1 identifying the new or reaffirmed selected alternative and an updated CD-1 cost range. This revised CD-1 information, to include the new CD-1 cost range and CD-1 approval date, will be reflected within PARS and all subsequent PDS and similar project documentation. Lessons learned shall be captured by the Program in consultation with the FPD during this reassessment of a selected alternative and entered into the DOE lessons learned system of record, currently known as DOE OPEXShare, as described in DOE O 210.2, Corporate Operating Experience Program, current version.

Table 3: CD-1 Requirements¹

Prior to CD-1	Approval Authority ²
Approve an acquisition strategy (AS) with endorsement from PM for major system projects. (Refer to DOE G 413.3-13, current version.)	PSO
Approve a preliminary PEP. The tailoring strategy, if required, can be included in the PEP or placed in a separate document. (Refer to DOE G 413.3-15, current version.)	CE or PME
Approve appointment of the Federal Project Director considering the requirements in DOE O 361.1, current version.	CE or PME
Establish and charter an integrated project team to include a responsibility assignment matrix. The Charter may be included in the PEP. (Refer to DOE G 413.3-18, current version.)	PSO ≥\$1 billion FPD <\$1 billion
Develop a Risk Management Plan (RMP) and complete an initial risk assessment of a recommended alternative. This may be included in the PEP. For evaluating the safety-in-design strategy, prepare risk and opportunity assessments for input to the RMP. (Refer to DOE G 413.3-7, current version, and DOE-STD-1189-2016.)	
For projects with a TPC ≥\$300 million, PM will develop an independent cost estimate and/or conduct an independent cost review, as they deem appropriate.	
For projects with a TPC ≥\$300 million, the PMRC will review and analyze the CD and make recommendations to the ESAAB, CE, or PME, as applicable, before approval.	CE ≥\$1 billion PME <\$1 billion
Comply with the one-for-one replacement legislation (excess space/offset requirement) as mandated in House Report 109-86.	
For major system projects, develop a design management plan that establishes design maturity targets at critical milestones through final design.	
Complete a conceptual design.	
Conduct a design review of the conceptual design with reviewers external to the project.	
<i>For Hazard Category 1, 2, and 3 nuclear facilities, a code of record shall be initiated during the conceptual design.</i>	
Complete a conceptual design report. Refer to Appendix C, paragraph 8.	
Conduct an analysis of alternatives (AoA) that is independent of the contractor organization responsible for managing the construction or constructing the capital asset project, for projects with an estimated TPC greater than the minor construction threshold or \$50 million, whichever is higher. (Refer to Government Accountability Office [GAO]-16-22.) The AoA may require life-cycle cost estimates to distinguish between alternatives.	PME
For major system projects, or first-of-a-kind engineering endeavors, conduct a technology readiness assessment and develop a technology maturation plan, as appropriate. At this stage, each critical technology item or system shall achieve a Technology Readiness Level 4 (TRL-4). (Refer to DOE G 413.3-4, current version.)	PME
Prepare a Preliminary Hazard Analysis Report (PHAR) for facilities that are below the Hazard Category 3 nuclear facility threshold as defined in 10 CFR § 830, Subpart B.	Field Organization
Develop and implement an Integrated Safety Management Plan into management and work process planning at all levels per DOE G 450.4-1 (current version).	

Establish a Quality Assurance Program (QAP). (Refer to 10 CFR § 830, Subpart A, DOE O 414.1, <i>Quality Assurance</i> , current version, and DOE G 413.3-2, <i>Change Control Management Guide</i> , current version.) For nuclear facilities, the applicable national consensus standard shall be Nuclear Quality Assurance (NQA)-1-2008 (Edition) and NQA-1a-2009 (Addenda).	
Identify general Safeguards and Security requirements for the recommended alternative. (Refer to DOE O 470.4, <i>Safeguards and Security Programs</i> , current version and DOE G 413.3-3, <i>Safeguards and Security for Program and Project Management</i> , current version.)	
Complete a <i>National Environmental Policy Act</i> (NEPA) strategy by issuing a determination (e.g., environmental assessment), as required by DOE Policy (P) 451.1, <i>National Environmental Policy Act Compliance Program</i> , current version. Prepare an Environmental Compliance Strategy, to include a schedule for timely acquisition of required permits and licenses.	
Update (or prepare if not already available) project data sheet, or other funding documents for MIE and OE projects, and A-11 business case, if applicable. This must contain an estimate of the required amount of PED funds to execute the planning and design portion of a project (period from CD-1 to completion of the project's design). (Refer to DOE CFO budget call for PDS and business case template.)	
Conduct a preliminary security risk assessment, if necessary. (Refer to DOE O 470.4, current version, and DOE G 413.3-3, current version.)	
<i>For Hazard Category 1, 2, and 3 nuclear facilities, prepare a safety design strategy (SDS) to guide the development of the conceptual design, with the concurrence of the Chief of Nuclear Safety (CNS) or with written advice of the Chief of Defense Nuclear Safety (CDNS), as appropriate, for projects subject to DOE-STD-1189-2016.</i>	<i>SBAA and FPD</i>
<i>For Hazard Category 1, 2, and 3 nuclear facilities, conduct an independent project review (IPR) to ensure early integration of safety into the design process. (Refer to DOE G 413.3-9, current version and DOE-STD-1189-2016.)</i>	<i>PSO</i>
<i>Prepare a conceptual safety design report (CSDR)⁴ for Hazard Category 1, 2, and 3 nuclear facilities, including preliminary hazard analysis. For a project involving a major modification of an existing facility, the SDS must address the need for a CSDR, as well as the required preliminary documented safety analysis (PDSA). (Refer to DOE-STD-1189-2016.)</i>	<i>SBAA via the Safety Review Letter</i>
<i>Prepare a safety review letter, with concurrence from the FPD, on the DOE review of the CSDR for Hazard Category 1, 2, and 3 nuclear facilities. (Refer to DOE-STD-1189-2016 and DOE-STD-1104-2016.)</i>	<i>SBAA</i>
Post-CD-1 Approval	
Submit all CD documents to PM.	
Begin expenditure of PED, MIE, or OE funds for the project design.	
Develop an acquisition plan, if applicable.	
Continue monthly PARS reporting (excluding earned value). FPD, program manager, and PM will provide monthly assessments, as appropriate.	
Annually conduct project peer reviews of active projects when the top-end range is \$300 million or greater. Individuals leading project peer reviews, or other reviews intended to meet the project peer review requirements in this Order, shall elicit lessons learned with potential Department-wide implications and submit them into DOE lessons learned system of record, as described in DOE O 210.2, current version.	
Continue QPRs with the PME of their designee.	

<i>For nuclear facilities, develop a checkout, testing and commissioning plan in preparation for acceptance and turnover of the structures, systems, and components at CD-4. (Refer to DOE-STD-1189-2016.)</i>	
NOTES: 1. Documents and reports are not intended to be and may be combined. 2. Where no approval authorities are noted, authorities are established through other directives or the Program Offices (e.g., Functions and Requirements Assignment Matrix). 3. Title 10 CFR § 830 does not apply to accelerators and their operations. 4. Per 10 CFR § 830.206(b), a major modification of an existing Hazard Category 1, 2 or 3 nuclear facility requires DOE approval of the nuclear safety design criteria to be used in the PDSA, unless the contractor uses the design criteria in DOE O 420.1, current version. Content requirements and guidance for the SDS are specified in DOE-STD-1189-2016.	

c. **CD-2, Approve Performance Baseline.**

- (1) Completion of preliminary design is the first major milestone in the project execution phase. The design must be sufficiently mature (refer to Appendix C, paragraph 8) at the time of CD-2 approval to provide reasonable assurance that the design will be implementable within the approved PB. The document signed by the CE or PME approving CD-2 must clearly specify the project's approved PB, which includes the TPC, CD-4 date (month and year), scope and minimum key performance parameters (KPPs) that must be achieved at CD-4. Table 4 lists the requirements needed to attain CD-2.

Table 4: CD-2 Requirements¹

Prior to CD-2		Approval Authority²
Approve an updated acquisition strategy if there are any major changes to the acquisition approach. Obtain endorsement from PM for major system projects. (Refer to DOE G 413.3-13, current version.)		PSO
Establish a PB, reflective of identified and assessed risks and uncertainties, to include scope, TPC, CD-4 date, and minimum KPPs (if applicable). The key project milestones and completion dates shall be stated no less specific than month and year. The scope will be stated in quantity, size, and other parameters that give shape and form to the project. The funding assumptions upon which the PB is predicated will be clearly documented and approved. (Refer to DOE G 413.3-5, current version.)		FPD
Approve updated PEP. (Refer to DOE G 413.3-15, current version.)		CE or PME
• Prepare a funding profile to support the execution of the PB and reflect in the budget document. The funding profile may be included in the PEP.		CE or PME
• Approve long-lead item procurements, if necessary. Approval may be concurrent with (or prior to) CD-2 approval. (Long-lead item procurement approval will be designated as CD-3A.)⁵		CE or PME
Develop a project management plan, if applicable. (Refer to Attachment 1.)		

Prior to CD-2		Approval Authority ²
Perform a PB external independent review (EIR) or an IPR. PM will conduct EIRs to validate the PB for projects with a TPC $\geq$ \$300 million. PM must issue a PB validation letter to the PSO that describes the cost, schedule, and scope being validated. Project Management Support Office (PMSO) will conduct IPRs to validate the PB for projects with a TPC $<$ \$300 million. (Refer to DOE G 413.3-9, current version). For projects with a TPC $\geq$ \$100 million, PM will develop an independent cost estimate (ICE). The ICE will support validation of the PB.		PM $\geq$ \$300 million PMSO $<$ \$300 million
Complete a preliminary and/or final design. Hazard Category 1, 2, and 3 nuclear facilities shall achieve at least 90% design completion prior to CD-2 approval. Non-nuclear project designs shall be sufficiently mature to prepare a project baseline with 70–90% confidence prior to CD-2 approval. (See Appendix C, paragraph 7a for definition of 90% design complete.)		
Conduct a design review of the preliminary and final designs.		
For Hazard Category 1, 2, and 3 nuclear facilities, design reviews should include a focus on safety and security systems. Additionally, the Code of Record shall be placed under configuration control during preliminary design. It is controlled during final design and construction with a process for reviewing and evaluating new and revised requirements. New or modified requirements are implemented if technical evaluations determine that there is a substantial increase in the overall protection of the worker, public or environment, and that the direct and indirect costs of implementation are justified in view of this increased protection.		
Complete a preliminary design report.		
For projects with a TPC $\geq$ \$300 million, the PMRC will review and analyze the CD and make recommendations to the ESAAB, CE, or PME, as applicable, before approval.		CE $\geq$ \$1 billion PME $<$ \$1 billion
Conduct a project definition rating index analysis, as appropriate, for projects with a TPC $\geq$ \$300million. PM will review as part of the EIR. (Refer to DOE G 413.3-12, current version.)		FPD
For major system projects, or first-of-a-kind engineering endeavors, conduct a technology readiness assessment and develop a technology maturation plan, as appropriate. At this stage, each critical technology item or system shall achieve a TRL-7. (Refer to DOE G 413.3-4, current version.)		PME
Employ an Earned Value Management System compliant with EIA-748, current version, or as required by the contract. This is performed by the contractor. (Refer to DOE G 413.3-10, current version.)		
Prepare a hazard analysis report for facilities that are below the Hazard Category 3 nuclear facility threshold as defined in 10 CFR § 830, Subpart B, by updating the PHAR based on new hazards and design information.		Field Organization
Determine that the Quality Assurance Program is acceptable and continues to apply. (Refer to 10 CFR § 830, Subpart A, DOE O 414.1, current version, and DOE G 413.3-2, current version.)		

Prior to CD-2		Approval Authority ²
Issue the final environmental impact statement or environmental assessment and finding of no significant impact, as required by 10 CFR § 1021, National Environmental Policy Act Implementing Procedures. For an environmental impact statement, the appropriate authority shall issue the record of decision after CD-2 is granted, but prior to CD-3 approval. (Refer to DOE P 451.1, current version.)		
Update project data sheet, or other funding documents for MIE and OE projects, and A-11 business case, if applicable. (Refer to DOE CFO budget call for PDS and business case template.)		
For Hazard Category 1, 2, and 3 nuclear facilities , conduct a technical independent project review (TIPR). The TIPR is required at or near the completion of the preliminary design. The TIPR is not required for non-nuclear facilities. (Refer to DOE G 413.3-9, current version).		PSO
For Hazard Category 1, 2, and 3 nuclear facilities , update the safety design strategy, with the concurrence of CNS or with written advice from CDNS, as appropriate, for projects subject to DOE-STD-1189-2016.		SBAA and FPD
Prepare preliminary safety and design results ³ that update the CSDR for Hazard Category 1, 2, and 3 nuclear facilities based on updated hazard analysis and design information. These results complete the preliminary design phase and allow for DOE review prior to completing the final design phase. (Refer to DOE-STD-1189-2016.)		SBAA via the Safety Review Letter
Prepare a safety review letter, with concurrence from the FPD, based on a DOE review of the preliminary safety and design results for Hazard Category 1, 2, and 3 nuclear facilities. This DOE review should be scheduled as early as practicable, after contractor completion of the preliminary design, to minimize project risk. (Refer to DOE-STD-1189-2016 and DOE-STD-1104-2016.)		SBAA
Prepare the PDSA ⁴ for newly planned Hazard Category 1, 2, and 3 nuclear facilities based on updated hazard analysis and design information and, also, for major modifications of existing facilities. (Refer to 10 CFR § 830, Subpart B, and DOE-STD-1189-2016.)		SBAA via the SER
Prepare a safety evaluation report (SER), with concurrence from the FPD, based on review of the PDSA for Hazard Category 1, 2, and 3 nuclear facilities. (Refer to 10 CFR § 830, Subpart B, and DOE-STD-1104-2016.)		SBAA
Submit all CD documents, and if there are changes to the PB, submit baseline change proposal (BCP) documents to PM.		
For projects with a TPC ≥\$300 million, the PMRC will review and analyze the PB deviation disposition request and make recommendations to the ESAAB, CE, or PME, as applicable, before approval. The resulting BCP must also be presented to the PMRC before convening an ESAAB.		CE ≥\$1 billion PME <\$1 billion
Obtain PME endorsement on any changes to the approved funding profile that negatively impacts the project.		

Prior to CD-2		Approval Authority ²
Continue monthly PARS reporting (including earned value data). FPD, program manager, and PM will provide monthly assessments.		
Continue QPRs with the PME or their designee.		
Annually conduct project peer reviews for projects with a TPC >\$300 million. Individuals leading project peer reviews, or other reviews intended to meet the project peer review requirements in this Order shall elicit lessons learned with potential Department-wide implications and submit them into DOE lessons learned system of record, as described in DOE O 210.2 (current version).		
	NOTES: 1. Documents and reports are not intended to be and may be combined. 2. Where no approval authorities are noted, authorities are established through other directives or the Program Offices (e.g., Functions and Requirements Assignment Matrix). 3. Title 10 CFR § 830 does not apply to accelerators and their operations. 4. Per 10 CFR § 830.206(b), a major modification of an existing Hazard Category 1, 2 or 3 nuclear facility requires DOE approval of the nuclear safety design criteria to be used in the PDSA, unless the contractor uses the design criteria in DOE O § 420.1, current version. Content requirements and guidance for the SDS are specified in DOE-STD-1189-2016. 5. There are some statutory (appropriation and authorization) and/or regulatory provisions that implicate this Order. Solely for purpose of the application of appropriations and authorization laws and regulations and for any approvals under those laws and regulations, CD-3A (or CD-3X) will be treated as separate from and not within the scope of those laws and regulations as they pertain to CD-2 and CD-3. For all other purposes, from a project management perspective, CD-3A (or CD-3X) remains part of the project total scope and remains embedded in the project TPC.	

(2) Optional Budget Request Process for Construction Projects. Normally, funds for construction cannot be requested until CD-2 approval is obtained, or when CD-3A approval is obtained to support CD-3A scope of work. Upon PME approval, a construction project can submit a line-item budget request prior to CD-2 approval, provided the PME accepts the following conditions:

- Project will document the strategy to request funds (i.e., CD-3A) prior to CD-2 approval in the AS and preliminary PEP.
- Construction funds cannot be expensed until the approval of CD-2 and CD-3, with exception of CD-3A, approval for long-lead procurement, where applicable.
- CD-2 approval is obtained within 2 years following OMB budget submission to Congress. Typically, there are no exceptions and subsequent budget requests would not be allowed until CD-2 approval. Any significant delays in scheduling necessary meetings for ESAAB approval will result in cost and schedule impacts that will be incorporated in the final Performance Baseline.

- If CD-2 approval is not achieved within 2 years following budget submission, any future budget requests for construction must be approved by the CE through the ESAAB process.
 - A default original PB (or TPC) will be established equivalent to the top-end range at CD-1 with the initial budget submission. At that time, a funding profile will be established and included in the PDS to support this default cost baseline.
 - This original PB is refined with formal CD-2 approval and cannot exceed the top-end range established at CD-1. The project funding profile will be modified accordingly to align with the CD-2 cost baseline.
 - If long-lead procurement is needed upon budget submission, pursue CD-3A with the PME. (The default CD-2 PB [or TPC] is the upper limit of the CD-1 cost range.)
- (3) Execution typically comprises the longest and most costly phase of the project but is only a fraction of the total life-cycle cost of a project. Value management (VM) and VE techniques, as appropriate, should be used to ensure that the most effective life-cycle solutions are implemented. Refer to OMB Circular A-131.
- d. CD-3, Approve Start of Construction/Execution. CD-3 is a continuation of the execution phase. The project is ready to complete all construction, implementation, procurement, fabrication, acceptance and turnover activities. Table 5 lists the requirements needed to attain CD-3.

Table 5: CD-3 Requirements¹

Prior to CD-3	Approval Authority ²
Approve updated CD-2 project documentation that reflects major changes from final design, the PEP, PB, AS, and PDS/funding documents for MIE and OE funds.	CE or PME
Complete and review the final design for non-nuclear facilities and less than Hazard Category 3 nuclear facilities with sufficient maturity to baseline and approve start of construction.	
Employ a contractor self-certified Earned Value Management System compliant with EIA-748, current version, or as required by the contract. (Refer to DOE G 413.3-10, current version.)	
Perform an EIR by PM for construction or execution readiness on all major system projects. (Refer to DOE G 413.3-9, current version.) Perform an IPR by the appropriate PMSO for non-major system projects unless justification is provided and a waiver is granted by the PME. For projects with a TPC $\geq$ \$100 million, PM will develop an ICE.	PM $\geq$ \$1 billion PMSO $<$ \$1 billion
For projects with a TPC $\geq$ \$300 million, the PMRC will review and analyze the CD and make recommendations to the ESAAB, CE, or PME, as appropriate, before approval.	CE $\geq$ \$1 billion PME $<$ \$1 billion

For major system projects where a significant critical technology element modification occurs subsequent to CD-2, conduct a technology readiness assessment, as appropriate. (Refer to DOE G 413.3-4, current version.)	PSO
Update the hazard analysis report for facilities that are below the Hazard Category 3 nuclear facility threshold as defined in 10 CFR § 830, Subpart B, based on new hazards and design information.	Field Organization
Prior to start of construction, prepare a construction project safety and health plan ⁴ in accordance with 10 CFR § 851, Appendix A, section 1(d). This plan must be kept current during construction.	Field Organization
Update the Quality Assurance Program for construction, field design changes, and procurement activities. (Refer to 10 CFR § 830, Subpart A, DOE O 414.1, current version, and DOE G 413.3-2, current version.)	
Finalize the security risk assessment report, if necessary. (Refer to DOE O 470.4, current version and DOE G 413.3-3, current version.)	
Post-CD-3 Approval	
Submit all CD documents to PM.	
Commit all the resources necessary, within the funds provided and within the TPC, to execute the project.	
For projects with a TPC ≥\$300 million, the PMRC will review and analyze the PB deviation disposition request and make recommendations to the ESAAB, CE, or PME, as applicable, before approval. The resulting BCP must also be presented to the PMRC before convening an ESAAB.	CE ≥\$1 billion PME <\$1 billion
Within 90 days, submit lessons learned not previously recognized regarding up-front project planning and design into the DOE lessons learned system of record, as described in DOE O 210.2, current version, for projects with a TPC >\$300 million.	
Update PDS, or other funding documents for MIE and OE, and A-11 business case, if applicable. (Refer to DOE CFO budget call for PDS and business case template.) Update life-cycle cost estimate, as appropriate.	
Conduct an Earned Value Management System surveillance to ensure compliance with EIA-748, current version, or as defined in the contract.	
Continue monthly PARS reporting (including earned value data). FPD, program manager, and PM will provide monthly assessments.	
Continue QPRs with the PME or their designee.	
Continue annual project peer reviews for projects with a TPC >\$300 million. Individuals leading project peer reviews, or other reviews intended to meet the project peer review requirements in this Order, shall elicit lessons learned with potential Department-wide implications and submit them into the DOE lessons learned system of record, as described in DOE O 210.2, current version.	
NOTES: - Documents and reports are not intended to be and may be combined. - Where no approval authorities are noted, authorities are established through other directives or the Program Offices (e.g., Functions and Requirements Assignment Matrix). - Title 10 CFR § 830 does not apply to accelerators and their operations. - For Environmental Management (EM) cleanup projects, refer to 29 CFR § 1910.120.	

- e. CD-4, Approve Start of Operations or Project Completion. CD-4 is the achievement of the project completion criteria defined in the PEP, the approval of transition to operations, and it marks the completion of the execution phase. The approval of CD-4 is predicated on the readiness to operate and/or maintain the system, facility, or capability. Transition and turnover does not necessarily terminate all project activity. In some cases, it marks a point known as beneficial occupancy date (BOD) at which the operations organizations assume responsibility for starting operations and maintenance. The CE or PME approves CD-4 upon notification from the project team that all project completion criteria defined in the PEP have been met. The document signed by the CE or PME approving CD-4 must clearly specify the scope accomplished, the TPC, KPPs met, and the completion date (month and year) as it relates to the original CD-2 performance baseline and latest approved baseline change. The date the CE or PME signs the document represents the CD-4 completion date. Table 6 lists the requirements needed to attain CD-4.

Table 6: CD-4 Requirements¹

Prior to CD-4	Approval Authority ²
Verify that KPPs and project completion criteria have been met and that mission requirements have been achieved. The FPD will verify and document the scope accomplished, TPC, KPPs met, and the completion date as it relates to the original CD-2 performance baseline and the latest approved baseline change.	FPD
Issue a project transition to operations plan ³ that clearly defines the basis for attaining initial operating capability, full operating capability, or project closeout, as applicable. The plan will include documentation, training, interfaces, and draft schedules. (Refer to DOE G 413.3-16, current version.)	
For non-nuclear projects, conduct a formal assessment of the project's readiness to operate, as appropriate. Determine the basis for DOE acceptance of the asset and if the facility or area can be occupied from both a regulatory and a work function standpoint. Establish a beneficial occupancy/utilization date for the facility and/or equipment.	
Finalize the hazard analysis report for facilities that are below the Hazard Category 3 threshold as defined in 10 CFR § 830, Subpart B.	Field Organization
If applicable, complete and submit contractor evaluation documents to the PME, the appropriate PSO, Federal Procurement Office, and PM in accordance with Federal Acquisition Requirements (FAR) 42.15.	
For projects with a TPC ≥\$300 million, the PMRC will review and analyze the CD and make recommendations to the ESAAB, CE, or PME, as applicable, before approval.	CE ≥\$1 billion PME <\$1 billion
<i>Conduct an operational readiness review (ORR) or readiness assessment (RA) for Hazard Category 1, 2, and 3 nuclear facilities in accordance with DOE O 425.1, current version.</i>	
<i>Prepare the documented safety analysis³ with technical safety requirements for Hazard Category 1, 2, and 3 nuclear facilities. (Refer to 10 CFR § 830, Subpart B.)</i>	SBAA via the SER.
<i>Prepare a SER based on a review of the documented safety analysis and technical safety requirements for Hazard Category 1, 2, and 3 nuclear facilities. (Refer to 10 CFR § 830, Subpart B, and DOE-STD-1104-2016.)</i>	

<i>For nuclear facilities, the code of record must be included as part of the turnover documentation from a design and construction phase contractor to the operating phase contractor; from an operating phase contractor to the decommissioning phase contractor; and when a change in contractor occurs during any single life-cycle phase and is maintained under configuration control. (Refer to DOE-STD-1189-2016.)</i>	
Post-CD-4 Approval	
Submit all CD documents to PM.	
Finalize PARS reporting (including reporting earned value data through completion of the performance measurement baseline [PMB]).	
Within 90 days, submit lessons learned not previously recognized regarding project execution and facility startup into the DOE Lessons Learned System of record, as described in DOE O 210.2, current version.	
Within 90 days, submit an initial project closeout report.	
NOTES: 1. Documents and reports are not intended to be stand-alone and may be combined. 2. Where no approval authorities are noted, authorities are established through other directives or the Program Offices (e.g., Functions and Requirements Assignment Matrix). 3. Title 10 CFR §830 does not apply to accelerators and their operations. 4. For EM cleanup projects, refer to 29 CFR § 1910.120.	

- f. **Project Closeout.** After the project is complete, the next step is project closeout. Project closeout provides a determination of the overall closure status of the project, contracts, regulatory drivers, and fiscal condition. After CD-4 approval, the project is required to complete the activities listed in Table 7.

Table 7: Project Closeout Requirements¹

Prior to Project Closeout	Approval Authority²
Perform final administrative and financial closeout. Prepare the final project closeout report once all project costs are incurred and invoiced and all contracts are closed. The report includes final cost details as required to include claims and claims settlement strategy where appropriate. (Refer to DOE G 413.3-16, current version.)	
Establish and/or update the property record in the Facilities Information Management System (FIMS) for all construction of or modifications to real property. (Refer to DOE O 430.1, current version.)	
NOTES: 1. Documents and reports are not intended to be stand-alone and may be combined. 2. Where no approval authorities are noted, authorities are established through other directives or the Program Offices (e.g., Functions and Requirements Assignment Matrix). 3. Title 10 CFR § 830 does not apply to accelerators and their operations.	

5. Application of Requirements for Different Circumstances. Although most DOE projects will follow the requirements outlined in this Order, there are some differing project situations where customizing the process is beneficial:

- a. Environmental Management Cleanup Projects. When the Department, Congress or a regulatory agreement transfers or formally assigns cleanup responsibilities for a parcel of land or facilities to EM for cleanup, this will serve as the basis for a “mission need” in support of CD-0 approval by the PME. Characterization and analysis efforts are considered operational activities and will be conducted prior to selecting scope and performance parameters and establishing a PB. Any project costs that occur after CD-0 and prior to CD-4 approval are considered to be part of the project’s TPC. Normally, CD-1/2/3 will be accomplished simultaneously because project requirements (e.g., baseline development) and associated environmental documents (e.g., regulatory agreements) are finalized in unison. For demolition projects performed by EM, Appendix D replaces Appendix A and modifies applicable elements in Appendices B and C.
- b. Design-Build Projects. To address potential mission impacts, aggressive risk mitigation strategies are required for close-coupled or fast-tracked design-build projects. Risk management strategies must be outlined in the RMP and at a minimum must address:
 - All technical uncertainties;
 - The establishment of design margins to address the unique nature of the design; and
 - Increased technical oversight requirements.

The PDS must be submitted for the budget year in which the Design-Build contract is to be awarded and must include the costs of design as part of the TPC. The PSO may budget for PED funds if there is a need to develop significant performance or technical specifications for the project. For design-build projects, PED funds may be used for the design of line-item projects and may be used to develop a statement of work or a request for proposal whereas operating funds are used for MIE or OE projects.

- c. Projects Requiring Long-Lead Procurement. It may be necessary to obtain CD-3 approval early, namely CD-3A, for long-lead item procurement. When exercising long-lead procurement, the FPD must consider design maturity and the associated project risk. If the long-lead item is nuclear safety-related or nuclear safety-related equipment, safety document maturity must also be considered. A budget document, such as a PDS, should be submitted within the budget process requesting construction funds to procure long-lead items or indicating the use of PED funds for long-lead procurement.

This is the only instance when a CD action may be taken out of sequence (i.e., CD-3A in advance of CD-2). Activities such as site preparation work, site characterization, limited access, safety, and security issues (i.e., fences) are often necessary prior to CD-3 and may be pursued as long as project documents such as a PDS requesting construction or PED funds to procure the long-lead items and funding approvals are in place. The default CD-2 performance baseline (or TPC) is the upper limit of the CD-1 cost range. This represents that project execution has started, but only for the procurement of specified long-lead items. For projects involving construction of new Hazard Category 1, 2, and 3 nuclear facilities, DOE-STD-1189-2016 provides requirements for contractor justification of long-lead procurement items. DOE-STD-1104-2016 establishes the required method for DOE review and approval of long-lead procurement items.

- d. Commissioning of Capital Asset Projects for Nuclear/Chemical Process Facilities. For projects involving nuclear/chemical processes, Program Offices shall define a capital asset project as completed (CD-4) in a PEP. The Program Office must determine if hot commissioning (i.e., introduction of radioactive material) is a condition of CD-4. Ultimately, the capital asset must have the capability to meet the end-state capacity requirements approved in the CD-2 decision by the respective PME, but not as a condition of CD-4.
- e. Alternative Financing. In some instances, Alternative Financing may be the most appropriate method to obtain use of capital assets. In these instances, it is required that CD-0 and CD-1 approval be attained so that a full evaluation of the mission need and the alternatives can be accomplished. If alternative financing is selected and approved, further compliance with this Order will not be required. At that time, other policies, laws and regulations will apply. For further details, refer to DOE Acquisition Guide, Subchapter 70.3270 and DOE G 430.1–7, current version.

6. Baseline Management.

- a. Performance Baseline Deviation. A performance baseline deviation occurs when the approved TPC, CD-4 completion date, or performance and scope parameters cannot be met. This includes any disaggregation of scope in an effort to establish a smaller discrete project (or projects) for the immediate or at a later date. The FPD must promptly notify management whenever project performance indicates the likelihood of a PB deviation. When a deviation occurs, the approving authority must make a specific determination whether to terminate the project or establish a new PB by requesting the FPD to submit a BCP.

Additionally, all PB deviation decisions must be reported to the CE and PM. New PBs to be established because of a deviation must be validated by PM for projects with a TPC greater than or equal to \$300 million and by the PMSO for projects with a TPC less than \$300 million. In circumstances where a PB deviation is beneficial to the project, such as a lower TPC, earlier completion date, or significant scope enhancements, a validation of the PB deviation or approval by the PSO is not required.

When the Integrated Project Team (IPT), Program Office or independent oversight offices determine the PB scope, schedule, or cost thresholds will be breached, the Program Office is required to conduct an independent and objective root cause analysis to determine the underlying contributing causes of cost overruns, schedule delays, and performance shortcomings. A formal corrective action plan shall be developed by the Program Office to address root causes resulting in a project performance baseline deviation. The corrective action plan shall be submitted to the PME for approval, and along with the root cause analysis, inform the PME's decision during the BCP approval process.

The root cause analysis and corrective action plan will be provided to the PME as part of the rebaselining process to inform the PME's decision of whether to terminate or proceed with the project. Corrective actions shall be identified and presented to the PME for action approval.

During the performance baseline change process, PM shall assess and validate, via an external independent review and/or independent cost review, as appropriate, the extent and effectiveness to which corrective actions have been taken to address and resolve the identified root causes.

Following approval of a project performance BCP, PM, as a review team participant or observer on project peer reviews when necessary, and as appropriate, shall independently assess the effectiveness of approved corrective actions taken to address and resolve the identified root causes.

- b. Performance Baseline Changes. A performance baseline change represents an irregular event which should be avoided to the maximum extent. Table 8 identifies when a deviation must be approved by the CE. The approval by the CE does not constitute approval of individual contract changes and modifications. If a contract change is necessary, the contracting officer has exclusive authority to issue changes and modify contracts, but only if the changes or modifications comply with regulatory and statutory requirements. It is critical that the FPD and the contracting officer ensure that changes to the contract are identified, issued, administered, and managed in a timely manner over the life of the project and contract. The performance baseline change process should not be used to circumvent proper change control management (refer to DOE G 413.3-20, current version) and contract management. The document signed by the CE approving the BCP must clearly specify the project's revised PB, which includes the TPC, CD-4 date (month and year), scope and minimum KPPs that must be achieved at CD-4.

Table 8: Performance Baseline Change Authority

Performance Baseline Changes Requiring CE Approval	
Major System and Non-Major System Projects	
Technical	Any change in scope and/or performance that affect the ability to satisfy the mission need or are not in conformance with the current approved PEP and PDS. Increase in excess of the lesser of \$250M or 50% (cumulative) of the original CD-2 cost baseline.
OR	
Cost	

In addition, the CE must endorse any reduction in funding that adversely affects the project's approved funding profile for all non-major system projects and previously approved CE BCP actions. PM shall be notified of these funding decrements. The CE and PM shall be notified of all:

- Schedule delays that breach the original PB by greater than 12 months; or
- Post-CD-2 projects that get terminated; or
- Capital asset projects, regardless of value, no longer able to meet the Department's objective (see Appendix A, Paragraph 1).

The Under Secretaries are the approval authorities for PB changes below CE approval level. These approval authorities may not be delegated below the PSOs. New PB or PMB approval thresholds and authorities should be documented in the PEP for project changes below the thresholds identified above. These approval levels must be incorporated into the change control process for each project. Decrements to approved PB funding profiles must be endorsed by the PME. In circumstances where a PB change is beneficial to the project, such as a lower TPC, earlier completion date, or significant scope enhancements, PB changes can be approved at lower levels as designated in the PEP.

- c. Directed Changes. Directed changes are caused by DOE policy directives (such as those that have the force and effect of law and regulation), regulatory, or statutory actions and are initiated by entities external to the Department, to include external funding reductions. Directed change decisions are reviewed and verified by PM and OMB and follow the appropriate baseline management process.
- d. Change Control. Change control, as defined in the PEP, ensures that project changes are identified, evaluated, coordinated, controlled, reviewed, approved/disapproved, and documented in a manner that best serves the project. One key goal of change control is to ensure that PB thresholds are not exceeded. Approval authority for changes depends upon the estimated impact(s) of the change and can range from the contractor to the CE, usually with the involvement and support of a Change Control Board (CCB). The CCB membership, authorities, thresholds, and procedures should be detailed or referenced within the PEP.
- e. Contract Modifications for New Performance Baseline, if Applicable. Prior to approval of a baseline change by the PME, the FPD shall coordinate with the contracting officer to identify the specific contract changes that may be required, develop an independent government cost estimate (refer to FAR 36.203, Government Estimate of Construction Costs, and FAR 15.406-1, Pre-negotiation Objectives), establish a schedule for receipt of a contractor's proposals, obtain audit support, and ensure the timely analysis, negotiation, and execution of contract modifications that comply with regulatory and statutory requirements.

- f. Cancellations of Projects. If a project is to be cancelled at any point after CD-0, the respective PME shall approve a cancellation decision and PARS will be updated to reflect the cancellation of the project. For all post-CD-2 cancellations, a formal written notification shall be issued to the Under Secretary and the Office of the CFO via PM. The formal written notification shall outline the reasons for the cancellation, how the mission need will be impacted, and a disclosure of all funds expended prior to the cancellation and the costs associated with the cancellation. The CE shall be similarly notified of all post-CD-2 cancellations.

7. Energy Systems Acquisition Advisory Board.

The purpose of the ESAAB is to support the DOE's strategic objective of achieving and maintaining excellence in project management. The ESAAB advises the Secretary, Chief Executive for Project Management, and Departmental Project Management Executives on enterprise-wide project management policy and issues and assists the CE on critical CD milestones for major system projects and PB deviation dispositions with a TPC of \$1 billion or greater. The ESAAB will be supported by the PMRC, which provides enterprise-wide project management risk assessment and expert advice.

The ESAAB will not be responsible for project implementation and execution, which remains with the CE, PME, project owner, and FPD. The authority for approving CDs for major system projects will continue to reside with the CE and for non-major system projects will continue to reside with the appropriate PME. The ESAAB's role is to provide recommendations to the CE at those CD milestones and to the CE and PME at any other times as needed.

The ESAAB will convene at least quarterly to review all capital asset projects with a TPC of \$300 million or greater, focusing in particular on projects at risk of not meeting their PBs; discuss project management and project execution across the Department; and, if applicable, provide recommendations to the CE on CD milestones for major system projects. The ESAAB shall meet as often as deemed necessary for the execution of the ESAAB's functions. A call for a special ESAAB can also be made when an unforeseen review of a capital asset project is required. During these quarterly meetings, the ESAAB will meet with the PMRC and be briefed by the Chair of the PMRC or others as designated by the Chair.

Based on analysis provided by the program and other project management organizations, and any additional input from the committee, the ESAAB will evaluate project scope, cost and schedule estimates, management oversight processes, technical readiness, and other issues (including organization and staffing) that may have a material bearing on a project's successful delivery. In addition to the PMRC, the ESAAB may also identify and advise on uncertainties and risk factors affecting successful project execution as well as on compliance with applicable project management policies and procedures. To support the ESAAB's efforts, the ESAAB will have access to all relevant project-related information and data, including any PMRC analyses.

The ESAAB shall advise the CE on decisions related to CD milestones, including baseline change proposals and other matters as appropriate. The ESAAB shall review major system projects before all CDs and baseline change proposals are presented to the CE using information and data provided by the program and other project management organizations, including the PMRC. The PMRC, the cognizant FPD, and/or others, as appropriate, will brief the ESAAB as part of each ESAAB's review of projects for CDs. The ESAAB may request additional information and analyses from other individuals and organizations with project responsibilities, including Departmental staff.

a. ESAAB Membership. The members are (including anyone acting in such capacity):

- (1) Deputy Secretary, Chair
- (2) Under Secretary of Energy
- (3) Under Secretary for Science
- (4) Under Secretary for Nuclear Security
- (5) General Counsel
- (6) Chief Financial Officer
- (7) Chief Information Officer
- (8) Senior Procurement Executive, as appropriate
- (9) Director, Energy Dominance Financing
- (10) Director, Office of Project Management (ESAAB Secretariat)
- (11) Chair of the Project Management Risk Committee
- (12) The Secretary or Deputy Secretary may designate other PSOs or functional staff as ESAAB members (temporary or permanent) as needed.

The Deputy Secretary will serve as the Chair. In the event that the Deputy Secretary position is vacant, the Secretary shall designate a Chair from among the members. If the Deputy Secretary is recused from a matter involving the ESAAB or is otherwise unable to attend an ESAAB meeting, the Deputy shall designate a Chair from among the members. The Chair may elect to choose a Chair *pro tempore*, from among the members, to convene an ESAAB meeting to review a CD and to transmit the recommendation of the ESAAB to the Chair.

In the case of all members of the ESAAB (except the Chair), if the individual is recused from matters involving the ESAAB or is otherwise unable to attend an ESAAB meeting, or if the position is vacant, their deputy (or if applicable, their principal deputy) shall serve as an ESAAB member.

A simple majority of the ESAAB shall constitute a quorum. The ESAAB may invite other federal Departmental officials or employees to participate in meetings or supply information.

The ESAAB will document its recommendations and provide analysis prepared in support of recommendations to the CE, PME, and other officials, as appropriate. The ESAAB members will vote on all recommendations to the CE, PME, and other officials. Recommendations by the ESAAB shall be made by majority vote and the votes will be recorded in the minutes of the ESAAB meetings.

- b. “Paper” ESAAB: Streamlined ESAAB Process. In circumstances where the acquisition action is of relatively low monetary value, low risk, and requires non-controversial decisions (i.e., baseline deviation and CD approvals) that need CE or PME approval, a streamlined ESAAB achieves the required staff coordination and approval without convening a formal meeting of all ESAAB members. This process should be considered, when the following parameters are met:
 - (1) A Program Office requests PM to consider a streamlined ESAAB in lieu of a formal ESAAB meeting;
 - (2) PM will determine: (1) if a streamlined ESAAB is appropriate; (2) level of inter-office coordination required; and
 - (3) At a minimum, all streamlined ESAABs will be coordinated with PM, CIO, CFO, and the Office of the General Counsel with the expectation of expeditious review. If issues cannot be resolved within 15 days of document submission to ESAAB members, PM will forward the issues to the Deputy Secretary for final decision.
- c. ESAAB Issue Resolution. To ensure timely decision making, if open issues cannot be resolved in 15 calendar days following an ESAAB, PM will forward the issues to the Deputy Secretary for final decision.
- d. ESAAB Secretariat. The ESAAB Secretariat resides in PM and provides administrative and analytical support and recommendations to the ESAAB. When performing the Executive Secretariat duties, the Director of PM is accountable to the Deputy Secretary. The Executive Secretariat will prepare and coordinate all briefing materials in collaboration with appropriate programs and record and maintain all minutes of the ESAAB meetings.
- e. Non-Major System Project Advisory Boards. The designated PME will appoint an Advisory Board to provide advice and recommendations on actions for projects

that are not designated as major system projects. The designated PME is the Chair of the Advisory Board. The Advisory Board replicates and conducts identical functions to those performed by the ESAAB. Members may be selected from within the PME's organization.

However, at least one member from an office not under the PME will be designated as a contributing representative. PM will not be a board member for projects with a TPC less than \$1 billion, but must be invited to attend the Advisory Board meetings. The implementing documentation (including CD and BCP approval memoranda) and composition of each Advisory Board, along with meeting agendas and minutes, will be provided to PM.

- f. Project Management Risk Committee. The purpose of the PMRC is to support the DOE's strategic objective of excellence in project management. The Committee will leverage existing capabilities to provide enterprise-wide project management risk assessment and expert advice to the Secretary, CE, PME and the ESAAB on cost, schedule and technical issues regarding capital asset projects with a TPC of \$300 million or greater. Upon request of the CE, PME, or ESAAB, the Committee will also address projects with a TPC less than \$300 million that are at risk of not meeting their PBs.

The Committee will not be responsible for project implementation and execution, which remains with the CE, PME, project owner, and FPD. The authority for approving CDs for major system projects will continue to reside with the CE and for non-major system projects will continue to reside with the appropriate PME. The Committee's role is to provide recommendations to the CE, PME and ESAAB at those CD points and at any other time as needed.

The Committee shall be an integral part of the ESAAB and shall advise the CE, PME and ESAAB on decisions related to CD milestones, BCPs, and other matters as appropriate. They will also provide ongoing monitoring and assessments of projects throughout the CD process. In addition, the Committee will review project management policies and procedures, including the implementation of this Order, for Department-wide application and provide the Secretary, CE, PME and ESAAB with expert advice. This includes assuring that clear, strong Departmental functional responsibility extends from the PME to the project owner to the FPD and ensuring that issues are appropriately flagged and elevated early so that they may be appropriately addressed. Finally, the committee will enable the sharing of best practices and lessons learned information on a routine basis. To support the Committee's efforts, access to all project-related information and data will be made available from project assessment and data collections frameworks.

To support the committee's efforts, access to all project-related information and data will be made available from project assessment and data collections frameworks.

Project Assessments. The committee will assess, on a periodic basis, reviews that have been conducted at the Under Secretarial level, and advise the CE, PME, ESAAB and other program officials on project performance. These assessments will complement, but not duplicate or replace, the ongoing peer review processes within the Under Secretaries' organizations. The committee shall conduct more frequent and detailed assessments of higher risk projects, and provide advice and assistance to the CE, PME and ESAAB on a regular basis.

The committee will utilize project analyses conducted by the programs and other project management organizations to assess projects and advise the senior leadership on appropriate actions to address and mitigate risks associated with project scope, cost and schedule estimates, management oversight processes, technical readiness, and other issues (including organization and staffing) that may have a material bearing on the project's successful implementation. The committee will also identify and advise on uncertainties and risk factors affecting successful project implementation as well as on compliance with applicable project management policies and procedures.

Assessment of CD proposals and Baseline Change Proposals. The committee will use information and data provided by the program and other project management organizations to review and analyze projects before all CDs and BCP are presented to the CE, PME, or ESAAB. As appropriate, the respective FPD or designated program representative (prior to CD-1) will brief the committee as part of the assessment process. The committee may request additional information and analyses from the CE, PME, and other individuals with project responsibilities, including both Departmental staff and contractor managers. The committee, the respective FPD, and/or others, as appropriate, will brief the ESAAB as part of the ESAAB's review process for CDs. The committee will perform its assessments to support the CD milestone schedule established by the project owners such that the committee does not unnecessarily delay CDs if there are no issues.

The assessments may address, but are not limited to:

- Alternatives analysis to ensure that all viable options are thoroughly considered and the best alternative is recommended (CD-1)
- Scope, schedule, cost, design maturity level, and TRL to ensure they are appropriate prior to establishing a project baseline (CD-2)
- Construction readiness to ensure the project is prepared to begin construction (CD-3)
- Operational readiness to make certain a project is ready to start operations (e.g., evaluating operational readiness reviews) (CD-4).

Strengthening Peer Reviews. To enhance the peer review process, each Under Secretary's Office of Project Assessments will provide sufficient notice to the committee regarding upcoming peer reviews. The committee will advise on planned peer reviews, as needed, to ensure review groups are focused on pressing issues, and recommend review team members, as appropriate. The committee will evaluate results of the reviews as well as related corrective actions.

Independent Assessments. The committee may recommend to the CE, PME or ESAAB that an independent assessment of a project be conducted.

Advising Senior Leadership. The Committee will meet at least quarterly with the ESAAB to review all capital asset projects with a TPC of \$300 million or greater with a focus on projects at risk of not meeting their performance baselines, to discuss project management across the Department, and, if applicable, to provide recommendations to the ESAAB on CD milestones for projects under the Committee's purview. The Chair of the Committee or others as designated by the Chair will brief the ESAAB at the quarterly meetings. The Committee may also recommend to the Secretary, CE or ESAAB that the ESAAB review and advise on matters brought to its attention by the Committee.

Membership. The Secretary shall appoint the members of the committee. All committee members shall be federal employees who are experts in their representative fields or senior leaders with significant decision-making authorities. Standing members shall include:

- (1) Associate Deputy Secretary (or other senior advisor designated by the Secretary)
- (2) Director, Office of Project Management (Executive Secretariat)
- (3) Director, Office of Project Management, Office of Environmental Management.
- (4) Deputy Assistant Secretary for Acquisition and Project Management,
- (5) Office of Environmental Management
- (6) Director, Office of Project Assessment, Office of Science
- (7) Associate Deputy Director for Operations, Office of Science
- (8) Director, Office of Project Assessment, Office of the Under Secretary for Nuclear Security
- (9) Associate Administrator for Infrastructure, Office of the Under Secretary for Nuclear Security
- (10) Chief Operating Officer, Energy Dominance Financing or Director of Technical and Project Management, Energy Dominance Financing.

The Secretary will appoint a Chair from among the members. The Chair may designate a Vice Chair. The Director of PM will serve as the Executive Secretariat of the PMRC. When performing those duties, the Secretariat will be accountable to the Deputy Secretary. The Executive Secretariat will prepare and coordinate all briefing materials in collaboration with appropriate programs and will record and maintain all minutes of the committee meetings.

In the case of all members of the Committee (except the Chair), if the individual is recused from matters involving the Committee or is otherwise unable to attend a Committee meeting, or if the position is vacant, their deputy (or if applicable, their principal deputy) shall serve as a Committee member.

A simple majority shall constitute a quorum. The committee may invite other Departmental federal officials or employees to participate in meetings or supply information.

To the extent reasonable and practicable, recommendations by the Committee shall be made by consensus, although they may also be made by majority vote or, in the event there are less than three sitting members, by unanimous vote. Any dissenting votes will be noted in the minutes of the meetings. The Committee will document its recommendations and provide analysis prepared in support of its recommendations to the CE, PME, and ESAAB, as appropriate.

APPENDIX B RESPONSIBILITIES

Three objectives regarding roles and responsibilities that are necessary to achieve defined project objectives as well as the objectives of this Order are:

- Strengthening line management accountability for successful project management results;
- Clearly defining the roles, responsibilities, authority, and accountability of the Federal Project Management Team relative to the contractor Project Management Team; and
- Developing effective Integrated Project Teams (IPTs) to assist the Federal Project Director (FPD) in planning, programming, budgeting, and successfully acquiring capital assets.

Line managers are responsible for successfully developing, executing, and managing projects within the approved performance baseline (PB). Delegation of authority from one line manager to a lower-level line manager must be documented and consistent with Department of Energy (DOE) delegation authorities and the qualifications of the lower-level line manager. Although the authority and responsibility for decision making may be delegated to a lower-level manager, the senior manager remains accountable for the decisions made by subordinate managers.

Clear roles, responsibilities and accountabilities among the project's owner, line management organizational elements, and support staff organizations shall be documented in the preliminary project execution plan at Critical Decision (CD)-1 and updated during subsequent changes to the project execution plan (PEP).

Key roles and responsibilities of line managers are described in the following sections:

1. Deputy Secretary (Chief Executive for Project Management). Serve as the Chief Executive (CE) responsible and accountable for all project acquisitions.
 - a. Exercise decision-making authority, including CDs for all major system projects.
 - b. Ensure that the FPDs appointed for major system projects are qualified, experienced, and have appropriate communication skills and leadership characteristics prior to designation.
 - c. Identify special interest projects and ensure senior executive-level quarterly reviews are provided for those projects.
 - d. Approve disposition of projects and PB changes at the CE approval level upon PB deviations.
 - e. Serve as Chair for the Energy Systems Acquisition Advisory Board (ESAAB).

- f. Approve site selection for facilities at new sites to include real estate purchases outside of the current DOE footprint.
 - g. Conduct quarterly project reviews for major system projects, which may be delegated to the Under Secretaries.
 - h. Approve exemptions as defined in paragraph 3.c.(3) and (4).
- 2. Under Secretaries.
 - a. Receive Project Management Executive (PME) authority from the CE, as appropriate.
 - b. Designate a project owner before CD-1.
 - c. Ensure that the FPDs appointed to non-major system projects are qualified and have appropriate communication skills and leadership characteristics prior to designation.
 - d. Delegate PME authority, as appropriate (refer to Appendix A, Table 1).
 - e. Exercise decision-making authority, including CDs, functioning as the PME.
 - f. Hold line accountability for applicable program and capital asset project execution and implementation of policy.
 - g. Hold accountability for project-related site environment, safety and health, and safeguards and security.
 - h. Serve as Chair and appoint members for Acquisition Advisory Boards.
 - i. Approve disposition of projects and PB changes below CE approval level upon PB deviations (may not be delegated below Program Secretarial Officers).
 - j. Maintain a list of special interest projects and ensure that senior executive-level quarterly reviews are provided for those projects.
 - k. Establish Project Management Support Office (PMSO) or delegate this responsibility to the Program Secretarial Officer.
 - l. Address and resolve issues on projects which report to them.
 - m. Conduct quarterly project reviews when serving as the PME. These reviews may be delegated to the Program Secretarial Officer.
- 3. Program Secretarial Officers and Deputy Administrators/Associate Administrators for the NNSA.
 - a. Hold line accountability for applicable capital asset project execution and implementation of policy.

- b. Hold accountability for project-related site environment, safety and health, and safeguards and security.
 - c. Approve mission need statement (MNS) documents and acquisition strategy (AS) documents for all capital asset projects (cannot be delegated).
 - d. Approve disposition of projects and PB changes below the CE approval level following PB deviations. If delegated, this authority cannot be further delegated.
 - e. Exercise decision-making authority, including CDs, when functioning as PME.
 - f. Ensure that the FPDs appointed to non-major system projects are qualified and have the appropriate communication skills and leadership characteristics prior to designation.
 - g. Delegate PME functions, as appropriate (refer to Appendix A, Table 1).
 - h. Nominate FPDs, when the PME is above the Program Secretarial Officer, no later than CD-1 (can be delegated). The FPD appointment is subject to the approval of the PME.
 - i. Approve the IPT charter for major system projects.
 - j. Serve as Chair and appoint members for Acquisition Advisory Boards.
 - k. Establish PMSO when responsibility is delegated or directed by the Under Secretaries.
 - l. Explicitly address integration of safety into design and construction for Hazard Category 1, 2, and 3 nuclear facilities as a key consideration in approval of project documentation and when functioning as PME.
 - m. Appoint a Safety Basis Approval Authority (SBAA) no later than CD-0 for projects including the design and construction of Hazard Category 1, 2, and 3 nuclear facilities or for projects including major modifications thereto.
 - n. Ensure lessons learned are captured and entered into the DOE Lessons Learned System of record, as described in DOE Order (O) 210.2 (current version).
4. Project Owner.
- a. Ensure the identification of requirements and request the necessary budget to support the mission need.
 - b. Visit the project site and review the progress against key milestones that were approved as part of the performance baseline.

5. Project Management Support Offices (when established).

- a. Provide independent oversight and report directly to the Under Secretaries, or Program Secretarial Officer, as appropriate.
- b. Serve as the Secretariat for the Program Secretarial Officer/National Nuclear Security Administration (NNSA)-level Advisory Board functions.
- c. Coordinate quarterly project reports.
- d. Perform IPRs, technical independent project reviews (TIPRs), and project peer reviews as requested by the PME or Program Offices.
- e. Develop Program-specific guidance, policies, and procedures.
- f. Collect, analyze and disseminate lessons learned and “best practices” into the DOE Lessons Learned System of record, as described in DOE O 210.2, current version.
- g. Coordinate with other DOE organizations and offices, including the Office of Project Management (PM), to ensure the effective and consistent implementation of project management policies and directives.
- h. Provide assistance and oversight to line project management organizations.
- i. Analyze project management execution issues.
- j. Actively assist senior management on issues related to project management performance, including implementation of corrective actions.
- k. Provide support to the FPDs.
- l. Validate the PB for capital asset projects with a TPC less than \$300 million.

6. Program Managers and Heads of Field Organizations.

- a. Direct initial project planning and execution roles for projects assigned by the PME.
- b. Initiate definition of mission need based on input from sites, laboratories and Program Offices.
- c. Establish the initial IPT in advance of the designation of a FPD.
- d. Oversee development of project definition, technical scope and budget to support mission need.
- e. Initiate development of the AS before CD-1 (during the period preceding designation of the FPD).

- f. Perform functions as a PME when so delegated.
 - g. Develop project performance measures and monitor and evaluate project performance throughout the project.
 - h. Allocate resources throughout the program.
 - i. Oversee the project line management organization and ensure the line project teams have the necessary experience, expertise, and training in design engineering, safety and security analysis, construction, and testing.
 - j. Serve as the FPD until the FPD is appointed.
 - k. Ensure that performance measures, resource allocations, and project oversight, as applicable, address integration of safety into design and construction for Hazard Category 1, 2, and 3 nuclear facilities.
 - l. Review prerequisite documents (as listed in Appendix A, Tables 2–5) before each CD submission.
 - m. Identify which contracts should incorporate the CRD and notify the contracting officer to include the CRD in the contract.
7. Project Management Executives. The following roles and responsibilities are for illustrative purposes and each designated PME is guided by the specific limits of their delegated authority (see DOE/NNSA Senior Procurement Executive for contract award and modification execution authority). There can only be one designated PME per project.
- a. Approve CDs for capital asset projects including CD-2, performance baseline approval and its associated funding profile.
 - b. Appoint and chair Acquisition Advisory Boards to provide advice and recommendations on key project decisions.
 - c. Approve the appointment of the FPD. Ensure that the FPD has the appropriate qualifications, competencies, and communication and leadership skills prior to designation by interviewing the proposed FPD for each project. When the FPD is not a designated career federal civil servant (i.e., contracted project manager) or is under an Intergovernmental Personnel Act (IPA) Agreement, the CE must endorse the FPD's appointment.
 - d. For nuclear facilities, designate the Design Authority at CD-1.
 - e. Monitor the effectiveness of FPDs and their support staff.
 - f. Approve project changes in compliance with change control levels identified in PEPs, to include all baseline change proposals and funding profile changes that impact the PB.

- g. Conduct quarterly project reviews.
 - h. Explicitly address integration of safety into design and construction for Hazard Category 1, 2, and 3 nuclear facilities as a key consideration in Quarterly Project Reviews and approval of project CDs.
 - i. Direct IPRs be conducted.
 - j. Ensure the FPD has a contracting, construction and design organization(s) that is prepared to execute the project planned.
 - k. Ensure the contractor has a competent manager supported by a qualified project team.
 - l. Ensure there is adequate skilled staff for federal oversight of the contractor.
 - m. Visit the project site and review the progress against key milestones that were approved as part of the performance baseline.
8. Federal Project Director. Successful performance of DOE projects depends on professional and effective project management by the FPD. The FPD is accountable to the PME, Program Secretarial Officer or delegated authority, as appropriate, for the successful execution of the project within a PB.

The FPD's assigned project must meet cost, schedule and performance targets unless circumstances beyond the control of the project directly result in cost overruns and/or delays. FPDs must demonstrate initiative in incorporating and managing an appropriate level of risk to ensure best value for the government. In cases where significant cost overruns and/or delays may occur, the FPD must alert senior management in a timely manner and take appropriate steps to mitigate them.

Roles and responsibilities of the FPD's team must be clearly defined relative to the contractor management team. DOE Guides provide further information. These roles and responsibilities include:

- a. Attain and maintain certification in concert with the requirements outlined in DOE O 361.1C, *Acquisition Career Management Program*, before they are delegated the authority to serve as FPD and/or within 1 year of appointment, achieve the appropriate level of certification.
- b. Serve as the single point of contact between federal and contractor staff for all matters relating to a project and its performance.
- c. Prepare and maintain the IPT Charter and operating guidance with IPT support and ensure that the IPT is properly staffed. Define and oversee the roles and responsibilities of each IPT member.
- d. Appointed as the contracting officer's representative, as delegated by the contracting officer.

- e. Lead the IPT and provide broad project guidance. Delegate appropriate decision-making authority to the IPT members.
- f. Approve the IPT charter for non-major system projects.
- g. Ensure the development and implementation of key project documentation (e.g., the PEP).
- h. Review and recommend approval of project cost, schedule, performance, and scope baselines.
- i. Ensure that design, construction, environmental, sustainability, safety, security, health and quality efforts performed comply with the contract, public law, regulations and Executive Orders.
- j. Coordinate collaboration between site management and project teams to partner with local utilities, communities, Tribal, local, and state governments; DOE offices such as the Office of Sustainability and Asset Management within the Office of Management; the Office of Sustainable Environmental Stewardship, within DOE's Office of Environment, Health, Safety and Security; DOE's Building Technologies Office; and the Federal Energy Management Program, as appropriate, to achieve project requirements.
- k. Ensure timely, reliable and accurate integration of contractor performance data into the project's scheduling, accounting, and performance measurement systems, to include Project Assessment and Reporting System (PARS).
- l. Evaluate and verify reported progress; make projections of progress and identify trends for early awareness and corrective action.
- m. Approve (in coordination with the contracting officer) changes in compliance with the approved change control process documented or referenced in the PEP.
- n. Ensure that safety is fully integrated into design and construction for Hazard Category 1, 2, and 3 nuclear facilities.
- o. Ensure early warning systems (triggered by thresholds) and communication channels are in place, so senior leadership is informed of potential project issues in time to make productive changes.
- p. Ensure all phases of the project are aligned with the budget request. All project documentation should be updated after the budget formulation process to ensure that information in the project management documentation is aligned with corresponding data in the budget documentation
- q. Develop and maintain the life-cycle cost estimate for the project, as appropriate.
- r. Identify, capture, and enter lessons learned into the DOE Lessons Learned System of record, as described in DOE O 210.2 (current version).

9. Departmental Staff and Support Offices. Departmental Staff and Support Offices develop policy and related implementing guidance, perform review functions, and provide advice and recommendations to Department leadership. Key roles and responsibilities of these offices regarding the acquisition of capital assets follow.
10. DOE/NNSA Senior Procurement Executives. The Senior Procurement Executive (SPE) will:
 - a. Execute the procurement functions and responsibilities in accordance with the Office of Federal Procurement Policy and Executive Order 12931, Federal Procurement Reform.
 - b. Serve as the principal procurement advisor to the CE, PME and the Chief Acquisition Officer.
 - c. Execute certain decisional authorities reserved for the SPE.
 - d. Exercise general procurement authority.
 - e. Delegate procurement authority to the Heads of Contracting Activity and contracting officers.
11. Contracting Officer. The contracting officer is the only member of the IPT delegated authority to enter into, administer, modify, change, and/or terminate contracts. Significant responsibilities are:
 - a. Serve as the principal procurement advisor to the FPD.
 - b. Participate in the formulation of the DOE and NNSA AS and Acquisition Plan.
 - c. Work with the IPT to develop solicitations and evaluate and award mission-oriented contracts.
 - d. Serve as a standing member of the Change Control Board (CCB) with sole authority to modify the contract.
 - e. Work with the IPT to ensure alignment between the PEP and the Contract Management Plan.
 - f. Assist in the development of contract cost, schedule and performance incentives.
 - g. Incorporate the applicable clauses, and terms and conditions in the solicitation and the contract. Ensure that the prime contractor complies with the requirements to include subcontractor flow-down requirements of this Order, Federal Acquisition Regulations (FAR) clauses and Earned Value Management System (EVMS)-related terms and conditions as identified by the FPD.

12. Office of Environment, Health, Safety and Security.
 - a. Advise the Deputy Secretary in his/her role as the CE on environmental, safety, and security matters related to all CD approvals.
 - b. Serve as a member of the IPR Team at the request of the CE, PSO, Program Manager, Operations/Field Office Manager or FPD.
 - c. Participate on EIRs, as an observer, at the request of PM.
 - d. Participate in safety and security documentation and QA reviews for acquisition projects at the request of PM and/or the PME when considered appropriate.
 - e. Participate in operational readiness reviews (ORRs) or readiness assessments (RAs) at the request of the line organizations.
 - f. Support the Central Technical Authorities (CTAs) as requested.
13. Office of Enterprise Assessments. Perform targeted reviews of technical processes and products associated with the design and construction of nuclear facilities.
14. Office of Project Management.
 - a. Serve as DOE's principal point of contact and advisor relating to project management.
 - b. Develop policy, requirements and guidance for the planning and management of capital asset projects.
 - c. Assist in the planning, programming, budgeting and execution process for the acquisition of capital assets in coordination with the Program Secretarial Officer and PMSO.
 - d. Support the Office of the Secretary, Deputy Secretary, Under Secretaries and Program Secretarial Officer in the CD process; and oversee the acquisition management process.
 - e. Serve as a member and Executive Secretariat for the ESAAB and the Project Management Risk Committee. When performing the Executive Secretariat duties, the Director of PM-1 is accountable to the Deputy Secretary.
 - f. Manage the PMCDP.
 - g. Establish, maintain and execute the EVMS Certification and Surveillance Review processes in accordance with established levels to ensure full compliance with applicable FAR and OMB requirements.

- h. May perform EVMS Certification and Surveillance Reviews of contractors with projects that have a TPC of \$300 million or greater and, on an exception basis, or at the request of the PMSO, of contractors with projects that have a TPC greater than the minor construction threshold or \$50 million, whichever is higher and \$300 million.
 - i. Review MNS documents for projects with a TPC of \$300 million or greater.
 - j. Review the AS for major system projects.
 - k. Maintain a corporate project reporting capability.
 - l. Establish, maintain and execute a corporate EIR capability to provide an independent assessment and analysis of project planning, execution and performance.
 - m. Validate the PB for all capital asset projects with a TPC greater than or equal to \$300 million to permit inclusion in the DOE annual budget.
 - n. For major system projects, conduct an independent cost review (ICR) prior to CD-0. For projects with a TPC of \$300 million or greater, develop an independent cost estimate (ICE) and/or conduct an ICR prior to CD-1, develop an ICE prior to CD-2 and CD-3.
 - o. Identify lessons learned with Department-wide implications and, in collaboration with those that submitted the lessons learned, propose risk-informed policy changes so future projects benefit from those lessons.
 - p. Elicit lessons learned with potential Department-wide implications and submit them into the lessons learned repository in the DOE Lessons Learned System of record, as described in DOE O 210.2, current version.
15. Integrated Project Team.
- a. Support the FPD.
 - b. Work with the contracting officer to develop a project AS and acquisition plan, as applicable.
 - c. Ensure that project interfaces are identified, defined and managed to completion.
 - d. Identify, define and manage to completion the project environmental, sustainability, safety, health, security, risk and QA requirements.
 - e. Identify and define appropriate and adequate project technical scope, schedule and cost parameters.

- f. Perform periodic reviews and assessments of project performance and status against established performance parameters, baselines, milestones and deliverables.
 - g. Plan and participate in project reviews, audits, and appraisals as necessary.
 - h. Review all CD packages and recommend approval/disapproval.
 - i. Review and comment on project deliverables (e.g., drawings, specifications, procurement, and construction packages).
 - j. Review change requests, as appropriate, and support CCBs as requested.
 - k. Participate, as required, in ORRs or RAs.
 - l. Support preparation, review and approval of project completion and closeout documentation.
 - m. Ensure safety is effectively integrated into design and construction as applicable to each team member's respective functional area for design and construction of Hazard Category 1, 2, and 3 nuclear facilities.
16. Central Technical Authorities. The CTAs are responsible for maintaining operational awareness, especially with respect to complex, high-hazard nuclear operations and ensuring that the Department's nuclear safety policies and requirements are implemented adequately and properly (see DOE O 410.1, *Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements*, current version, for further discussion). In this context, it is important to recognize that the CTAs have responsibilities related to nuclear safety directives that apply to projects. The overall roles and responsibilities of the CTAs include:
- a. Concur with the determination of the applicability of DOE directives involving nuclear safety included in contracts pursuant to 48 CFR § 970.5204-2(b).
 - b. Concur with nuclear safety requirements included in contracts pursuant to 48 CFR § 970.5204-2.
 - c. Concur with all exemptions to nuclear safety requirements in contracts that were added to the contract pursuant to 48 CFR § 970.5204-2.
 - d. Recommend to the Director, Office of Environment, Health, Safety and Security, issues and proposed resolutions concerning DOE safety requirements, concur in the adoption or revision of nuclear safety requirements (including supplemental requirements) and provide expectations and guidance for implementing nuclear safety requirements for use by DOE employees and contractors.
 - e. For DOE nuclear facilities, CTA concurrence is required on the directives included in requests for proposals for new prime contracts prior to its release and in revisions to existing prime contracts as per DOE O 410.1 (current version).

17. Chief of Defense Nuclear Safety and Chief of Nuclear Safety. The Chiefs (and staff) are responsible for evaluating nuclear safety issues and providing expert advice to the CTAs and other senior officials (see DOE O 410.1, current version, for further discussion). For Hazard Category 1, 2, and 3 nuclear facilities that are not regulated by the Nuclear Regulatory Commission (NRC), or as requested by the CTA or other senior officials for facilities regulated by the NRC, the Chief shall:
 - a. Provide support to both the CTA and PME regarding the effectiveness of efforts to integrate safety into design at each of the CDs and as requested during other project reviews.
 - b. Ensure that TIPRs and IPRs, as appropriate, evaluate: (1) the qualifications of IPT members having nuclear safety-related responsibilities, and (2) the effective implementation of DOE-STD-1189-2016 as applicable for design and construction of nuclear facilities.
 - c. For nuclear facilities, concur on the nuclear safety scope and breadth of TIPRs and IPRs. Ensure that TIPRs and IPRs evaluate the status of project planning to achieve operational readiness.
 - d. Advise Safety Basis Approval Authorities and concur with (Chief of Nuclear Safety) or provide written advice (Chief of Defense Nuclear Safety) prior to the approval of safety design strategies and revisions thereto.
18. Project Management Governance Board. The governance board (and staff) is responsible for evaluating project management issues and providing resolutions to PMSOs and program managers. The responsibilities will be an additional duty to the existing PMCDP certification review board whose primary function is to certify FPDs.
 - a. Responsibilities:
 - (1) Identify issues through PM as the Secretariat.
 - (2) Provide interpretation or clarification of Order requirements and resolve 413-series Guide issues.
 - (3) Evaluate the effectiveness of changes to department directives based on lessons learned with Department-wide implications from capital asset projects with a total project cost of \$750 million or more. The evaluation will use the results of the Department's project management success metrics from three or more major system capital asset projects that followed the version of this Order, or other departmental orders, that incorporated the corrective actions from lessons learned. To make these assessments possible and compelling, a project must follow the version of this Order in place when the project attained CD-2, Approve Performance Baseline, or was re-baselined until completion.

b. Membership:

- (1) PM Director and NNSA Associate Administrator for Infrastructure, or designees, co-chair the board.
- (2) One senior representative from each of the PMSOs to include Office of Environmental Management, NNSA, and Office of Science.
- (3) PM Deputy Director for Project Management.
- (4) PM serves as Secretariat.

APPENDIX C TOPICAL AREAS

1. Project Management Principles. This is the Department's framework for successful project execution:
 - a. Assurance that only value-added processes and procedures are utilized and continuously evaluated on the value of project management approaches to ensure project leadership focus on urgent and successful execution that exceeds mission delivery expectations.
 - b. Adoption and enforcement of a disciplined planning and execution culture modeled after commercial industry best practices, where applicable, for acquiring capital assets.
 - c. Urgency in operations to deliver cost-effective, timely results that support mission success by applying agile methodologies throughout planning and execution and empowering decision making at the lowest appropriate level.
 - d. Line management accountability.
 - e. Sound, disciplined, up-front project planning.
 - f. Well-defined and documented project requirements.
 - g. Development and implementation of sound acquisition strategies that incorporate effective risk handling mechanisms.
 - h. Well-defined and managed project scope and risk-based PBs and stable funding profiles that support original cost baseline execution.
 - i. Development of reliable and accurate cost estimates using appropriate cost methodologies and databases.
 - j. Properly resourced and appropriately skilled project staffs.
 - k. Effective implementation of all management systems supporting the project (e.g., quality assurance, integrated safety management, risk management, change control, performance management and contract management).
 - l. Early integration of safety into the design process.
 - m. Adoption of practical measures to incorporate clean energy sources, climate adaptation, resilience and sustainability early in the design.
 - n. Effective communication among all project stakeholders.

- o. Utilization of peer reviews throughout the life of a project to appropriately assess and make course corrections.
- p. A process to achieve operational readiness that is defined early in the project for Hazard Category 1, 2, and 3 nuclear facilities.

A project is a unique effort having defined start and end points; it is undertaken to create a product, facility, or system. Built on interdependent activities that are planned to meet a common objective, a project focuses on attaining or completing a deliverable within a predetermined cost, schedule and technical scope baseline.

All projects entail risk. Generally, the larger and more complex the project, the higher the probability that the performance baseline (PB) may be breached. By dividing larger projects into multiple smaller projects, the probability of success is generally increased as the duration, complexity, and attendant risks for each project have been reduced. Where appropriate, Program Offices in coordination with the Project Management Executive (PME) should consider breaking large projects into multiple, smaller, discrete usable projects (mindful of project interfaces) that collectively meet the mission need. However, the benefits of reduced risk exposure should be balanced with the potential for increased overhead costs.

Some things to consider when breaking larger projects into multiple smaller projects prior to establishing PBs (at Critical Decision [CD]-2):

- Time Horizon: Minimize the time horizon and risk to the maximum extent possible. Ideally, execution should take no more than 4 years starting from CD-3.
- Funding Profile: Develop each project's funding profile to support the optimum project schedule and deliver projects quickly.
- Segregate, by Building or Group, Similar Types of Facilities: Segregate nuclear from non-nuclear work; utility systems and buildings from general use facilities; fixed-price work from cost reimbursable work.
- Phase Projects: Execute well-defined, lower-risk, complete and usable projects first, allowing additional time to advance designs on more complex and/or technical projects. Project phases should not impede one another. Refer to Appendix C, paragraph 28.b.
- Span of Control: Ensure that the planned scope and pace of work is matched to the capacity and capabilities of the management team.
- Segregate Projects by Geographic Area: Occasionally, projects involve separate geographic locations with different site conditions, construction workforce environments, and regulatory and political pressures.
- Workforce Phasing: Phase construction and environmental remediation projects within the program to take advantage of "leap-frogging" trades (i.e., concrete workers moving from one project to the next).

A capital asset project can range from the construction of a simple facility, such as a warehouse, to a group of closely related projects managed in a coordinated way. This effort is known as program management.

Selection and designation of a program manager (see Appendix B, paragraph 6) is critical as they ensure that all their projects are properly phased and funded over time and that each project manager is meeting key milestones. Program managers are the advocate; they ensure proper resourcing and they facilitate the execution process. A program manager is responsible for managing programmatic risks and putting mitigation strategies in place to minimize risks to projects. Programmatic risks should be identified and quantified in terms of cost and/or schedule contingency and accounted for within one or more of the projects.

With multiple smaller projects, there may be a need for additional FPDs, perhaps at lower certification levels. However, each project, regardless of size, must be led by a certified Federal Project Director (FPD). Depending on the project size, an FPD can be assigned to direct one large project and/or multiple small projects. In addition, the project organizational structure, roles and responsibilities, and chain of command should be delineated in the project execution plan (PEP).

2. Acquisition Strategy (AS). An AS is a key activity formulated by the Integrated Project Team (IPT) leading up to CD-1. The AS is the overall plan for satisfying the mission need in the most effective, economical and timely manner. For more details, see Federal Acquisition Requirements (FAR) 34.004, Chapter 7, and Department of Energy (DOE) Guide (G) 413.3-13, current version.

Supporting the execution of the AS is the procurement strategy that must be documented in writing as prescribed by FAR 7.1 and for major systems acquisition, FAR 34.004.

While the AS represents a high-level plan which is approved through the CD review and approval process, the information and analysis required as part of an acquisition plan (AP), if applicable, provides greater focus on the analysis and strategies needed to appropriately execute procurements in accordance with sound business practices, statutory, regulatory and policy requirements. Typically, the AP will not be formulated until after the CD authority has selected the programmatic approach as part of CD-1. The review and approval of the AP resides within the contracting authority of the Senior Procurement Executive or their designee. Therefore, approval of the AS by the Program Secretarial Officer (PSO) cannot be presumed to constitute approval of the AP.

While the approval of the AS and the acquisition planning processes may be bifurcated, it is critical that the planning and formulation are aligned. The early formulation of an IPT (including the assignment of a contracting officer), the balance in its composition, and continuity in the membership is critical to the integration and alignment of the AS and acquisition planning processes.

If an AS includes the acquisition of real property, it must be reviewed by a certified Real Estate Specialist for regional land use impact and a real property alternative analysis must be conducted.

3. Analysis of Alternatives (AoA). The responsible program office is required to conduct an AoA that is independent of the contractor organization responsible for managing the construction or constructing the capital asset project. The AoA will be conducted for projects with an estimated TPC greater than the minor construction threshold or \$50 million (whichever is higher) prior to the approval of CD-1 and may also be conducted when a performance baseline deviation occurs or if new technologies or solutions become available. This determination will be made by the PME. The AoA will be consistent with published Government Accountability Office (GAO) best practices. Refer to GAO-16-22, DOE and NNSA Project Management: Analysis of Alternatives Could Be Improved by Incorporating Best Practices.
4. Baseline Clarity. There is only one original PB and it is documented at CD-2 approval. The PB represents the Department's commitment to Congress to deliver the project's defined scope by a particular date at a specific cost. Cost estimates in advance of CD-2 do not represent such commitments. Also, there should be clarity over the terms PB and performance measurement baseline (PMB) as they are different. The former is the project's baseline, and the latter is for use by the Earned Value Management System (EVMS). Refer to DOE G 413.3-10, current version, for further clarification.

FPDs, contracting officers, and program managers are accountable for ensuring contract and project documentation is complete, up-to-date, and auditable. Project baseline documentation must clearly define scope, key performance parameters, and the desired product, capability, and/or result. At project completion, there should be no question whether the objectives were achieved. Contracts and management and operations (M&O) work authorizations must clearly reflect project objectives and scope. Changes, especially to project objectives, need to be executed through a timely, disciplined change control process. Significant changes should be the exception, rather than the norm.

5. Cost Estimating. The authority and accountability for any project, including its costs, must be vested firmly in the hands of the FPD. Some cost estimate, or cost range, should be provided at each CD gateway, but the degree of rigor and detail for a cost estimate should be carefully defined, depending on the degree of confidence in project scale and scope that is reasonable to expect at that stage. Whatever figure or range that is provided should explicitly note relevant caveats concerning risks and uncertainties inherent in early estimates at CD-0 and CD-1 stages given the immature requirements definition at this juncture. A project owner should never be the sole cost estimator, at any stage (i.e., from CD-0 on), given the inherent conflict of interest. The second cost estimator should come from outside of the line manager's chain of command, to avoid conflict of interest.

Established methods and best practices will be used to develop, maintain, monitor, and communicate comprehensive, well-documented, accurate, credible, and defensible cost estimates. Cost estimates shall be developed, maintained, and documented in a manner consistent with methods and the best practices identified in DOE G 413.3-21 (current version), GAO-20-195G, *GAO Cost Estimating and Assessment Guide*, and, as applicable, with the FAR (e.g., FAR Subpart 15.4, Contract Pricing; FAR Subpart 17.6, Management and Operating Contracts), Office of Management and Budget Circular A-11, Preparation, Submission, and Execution of the Budget, and Department of Energy Acquisition Regulation (DEAR) Subpart 915-4, Contract Pricing.

6. Design Management.

- a. Design Management for Nuclear Facilities. Projects involving construction of new Hazard Category 1, 2, and 3 nuclear facilities intended to manage, store, process, or handle nuclear materials shall comply with DOE-STD-1189-2016 and shall achieve at least 90% design completion before CD-2.

The objective of this requirement is to ensure systems, structures, and components, the overall design, are sufficiently mature to meet project requirements and outcomes and thus fulfilling the mission need. Design maturity at 90% completion will ensure that a performance baseline is based on a credible cost estimate and achievable schedule for project completion.

As a minimum, 90% design complete includes:

- Complete final drawings and specifications that may be released for bid and/or construction
- A current and detailed cost estimate
- A current construction schedule
- Clearly defined testing requirements and acceptance criteria for the safety and functionality of all subsystems
- Independent technical, construction, operation and environmental reviews of the final drawings and specifications
- A quality control review that evaluates both technical accuracy and discipline coordination
- A final design that meets all the requirements stipulated in the code of record
- A final design review that should be a final validation of comment resolution from previous reviews and a review of any additional developments since the last review
- The checking and verification of any required waivers or exemptions.

The following design and safety basis documents would also need to be prepared prior to CD-2:

- Final design report
- Final design review report

- Preliminary documented safety analysis
 - Safety evaluation report.
- b. Design Management for Non-Nuclear Construction. Non-nuclear project designs shall be sufficiently mature to allow the PME to ensure achieving a complete, accurate project baseline with 70–90% confidence. At CD-1, a design plan shall establish anticipated levels of design maturity at each CD through final design. Independent project reviews should evaluate progress against the design plans established at CD-1.

In addition, for all capital asset projects greater than \$300 million, the Project Management Risk Committee (PMRC) will review all project design plans at CD-1 to ensure design maturity targets at critical milestones are reasonable based on numerous factors including technology readiness, complexity, total project cost, and any other relevant factor for the project. Ideally, at CD-2, the objective is to achieve a design maturity that would be used as a reliable indicator of a contractor's actual total costs at completion that would not exceed the original cost baseline.

- c. Design Management Plans for Major System Projects. To enhance fiscal insight and discipline for major system projects, an estimate of the required amount of project engineering and design (PED) funds to execute the planning and design portion of a project (period from CD-1 to completion of the project's design) shall be included in the CD-1 documentation.

As part of the development and approval process for CD-1 for major system projects, design management plans will be developed and included in the approval package. If at any time, through forecasting or actual costs, it becomes apparent the design cost target will be breached, then the PMRC shall be notified.

7. Design Maturity. All aspects of a project should be carefully studied to employ an economic and functional design that is closely tailored to the requirements. Particular attention shall be directed to advancing design maturity to a sufficient level prior to establishing the PB. The project design will be considered sufficiently mature when the project has developed a cost estimate and all relevant organizations have a high degree of confidence that it will endure to project completion. In determining the sufficiency of the design level, factors such as project size, duration and complexity will be considered.

In conducting external independent reviews (EIRs), the Office of Project Management (PM) will evaluate the sufficiency of the project's design maturity. This analysis will serve as a key evaluation factor in formulating its recommendation to validate a project's PB. In addition, when approving a CD, the PME should consider the sufficiency of the design maturity.

Project design is a process of preparing design and construction documents that result in fully integrated solutions. For a design to succeed, the entire project team must be involved in the process from project inception through delivery. The pre-conceptual design stage denotes the development and documentation of the functional parameters or capabilities that the potential project must meet. The development of criteria, which are complete and specifically related to the project requirements, allows for orderly development of the design. However, care shall be taken to avoid citing superfluous codes and standards; the primary purpose of functional criteria is to narrow the criteria to only those applicable to specific alternatives or options. These functional criteria are further developed, validated, and expanded during the conceptual design stage.

The conceptual design process must ensure that a solution or alternatives are not only responsive to an approved need, but also technically achievable and affordable and will provide the best value to the Department. Research, development, testing and other efforts may be required to finalize a concept. The conceptual design process may also require negotiation with outside organizations, stakeholders, or other legal entities on functional, technical, operational, and performance requirements or standards. Value management (VM) is a key process that supports reaching the best cost and benefit life-cycle cost alternative. VM should be employed as early as possible so that recommendations can be included in the planning and implemented without delaying the project or causing significant rework of designs. VM conducted during the early phases of a project yield the greatest cost reductions. At a minimum, the conceptual design shall develop the following:

- Scope required to satisfy the program mission requirements;
- Project feasibility;
- Attainment of specified performance levels;
- Assessment of project risks and identification of appropriate risk handling strategies;
- Reliable cost and schedule range estimates for the alternatives considered;
- Project criteria and design parameters;
- Impact on the site sustainability plan; and
- Identification of requirements and features.

A conceptual design report (CDR) shall be developed that includes a clear and concise description of the alternatives analyzed, the basis for the alternative selected, how the alternative meets the approved mission need, the functions and requirements that define the alternative and demonstrate the capability for success and the facility performance requirements, planning standards, and life-cycle cost assumptions. The CDR should also clearly and concisely describe the key performance parameters (KPPs) that will form the basis of the PB at CD-2. When the purpose of the project is remediation, restoration, or demolition, other forms of documenting the requirements and alternatives may be used.

The following are requirements for projects authorized by an annual *National Defense Authorization Act*. These statutory requirements apply only to projects in support of a national security program of the Department.

- Before submitting a request for funds for the construction project, the Secretary shall submit a request for funds for a conceptual design for a project if the estimated cost of the conceptual design exceeds the threshold as stated in 10 United States Code (U.S.C) 6277(a)(1), except as provided in 10 U.S.C. § 6277(a)(3).
- The conceptual design for a project shall be completed before requesting funds for a construction project as stated in 10 U.S.C. § 6277(a)(2).
- If the total estimated cost (TEC) for construction design for a project exceeds the threshold as stated in 10 U.S.C. § 6277(b), funds for that design must be specifically authorized by law.
- Construction on a project may not be started if the current TEC of the project exceeds by more than 25% the amount shown in the most recent project data sheet (PDS) submitted to Congress as stated in 10 U.S.C. § 6275(a), except as provided in 10 U.S.C. § 6275(b).

The preliminary design stage initiates the process of converting concepts to a more detailed design whereby more detailed and reliable cost and schedule estimates are developed. This stage of the design is complete when it provides sufficient information to support development of the PB. The appropriate completion percentage is dependent upon the type of project. For basic facilities, such as administrative buildings, general purpose laboratories, and utilities, the design does not have to be as mature as for a complex chemical or nuclear processing facility (as depicted in Figure 1). The design is mature when a point estimate can be developed and is ready for an independent review.

The determination of a design completion percentage for reporting purposes will be made by the Architect-Engineer, as well as by subsystem designers contracted to do the work, and/or other IPT members.

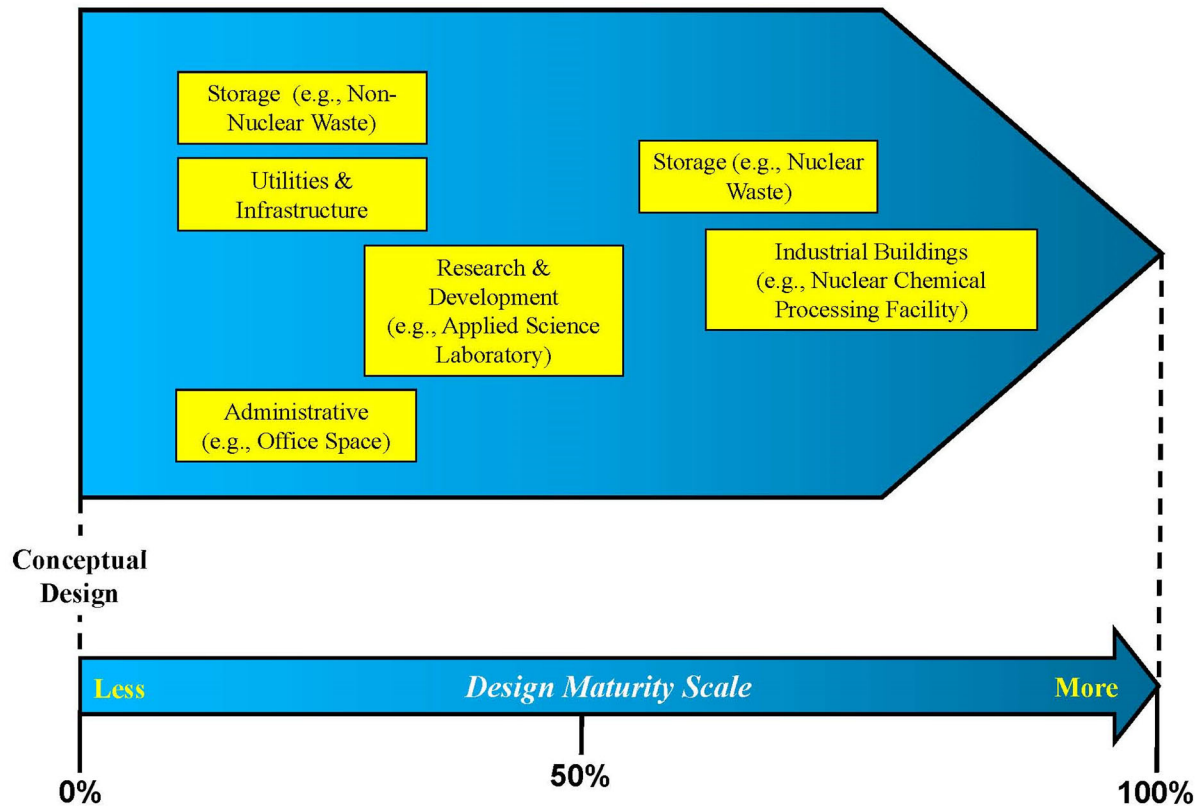


Figure 1: Facility Design Maturity General Guidelines for CD-2

Final design is the last stage of development prior to implementation. The purpose of the final design stage is to prepare final drawings, technical specifications and contract documents required to obtain bids and quotes for procurement and construction. The final design should include clear statements of testing requirements and acceptance criteria for the safety and functionality of all subsystems. The project scope should be finalized and changes (coordinated through a documented and approved change control process and Change Control Boards [CCBs]) should be permitted only for compelling reasons (i.e., substantial economies achieved through value engineering (VE), accommodation of changed conditions in construction, or reduction in funds or changes in requirements). In any case, construction should not be allowed to proceed until the design is sufficiently mature to minimize change orders.

Scientific systems, such as accelerators, detectors, and production and manufacturing facilities, may not follow a linear design process in which all subsystems reach the same maturity at the same time. Concurrency in these types of projects increases the risk because each subsystem design is dependent upon the design maturity of other subsystems. Projects that have several subsystems may have separate preliminary and final design stages. Consequently, final designs may be completed at various points in time in the system development process. Regardless, design reviews should be conducted for all projects and should involve a formalized, structured approach to ensure the reviews are comprehensive, objective, professional, and documented.

Design reviews (including constructability reviews, where appropriate) are a vital component of the entire process and should be explicitly included in the schedule for the design effort. Design reviews shall be conducted by reviewers external to the project to document the completion of conceptual design, preliminary design, and final design. The fundamental purpose of the design review is to ensure the following:

- Quality of the design.
- Meeting of operational and functional objectives.
- Maintenance of costs within the budget.
- Design sufficiency for the stage of the project; e.g., for final design, the design is biddable, constructible, and cost-effective.
- Interface compatibility.
- Compliance of final contract documents with the design criteria.
- A detailed, unbiased, analytical approach to all of the above items.

Complete design submittals are required at completion of established design stages; design and technical reviews shall then be performed. There shall also be a back-check review at design completion to verify that all comments made during the final design review stage have been addressed.

8. Earned Value Management System. An EVMS is required for all projects with a TPC greater than the minor construction threshold or \$50 million, whichever is higher. In accordance with FAR Subpart 52.234-4, a contractor's EVMS will be reviewed for compliance with EIA-748, current version, or as required by the contract. See Attachment 1. For firm-fixed-price contracts, a contractor EVMS is not required. If an EVMS compliant with EIA-748, current version, is not used, an alternative project control method must be approved by the PMSO. The alternate system requirement must be described in the PEP and provided to the contracting officer to be included as a contract requirement.

Alternative project control methods to be used must include at a minimum a work breakdown structure, integrated master schedule showing critical path, schedule of values, account of planned versus actual work and cost, and estimate at completion.

Only the facility construction and facility improvement activities of high-performance computing (HPC) projects will be subject to the earned value management (EVM) requirements of this Order. "Non-construction activities," which are programmatic elements of HPC activities including research and development, leases, and software development, will be subjected to the following components:

- EVM Compliance. Non-construction activities will be tracked with level of effort activities and milestone achievement and EVM compliance should be eliminated.

- Project Assessment and Reporting System (PARS) Reporting. Non-construction activities will be entered with narrative information only.

Project control information will be provided monthly to the FPD for entry into the Department's PARS system, including the baseline and status schedules, and data from the schedule of values and planned versus actual work and cost accounts.

For projects using EVMS and reporting EVMS data, the contracting officer, or the contracting officers' representative (COR), normally the FPD, will ensure that contractors provide required project performance data to the control account level in a contractually specified format.

- a. EVMS Certification. This is the initial determination that a contractor's EVMS is in full compliance with EIA-748, current version, or as required by the contract, on all applicable projects. Documentation of the certification shall be provided to the contracting officer and the PMSO. The contracting officer must provide copies of transmittal memoranda or related documents to PM. All relevant documentation shall be maintained in PARS.
- b. EVMS Surveillance. This is meant to ensure that a contractor's certified EVMS remains in full compliance with EIA-748, current version, or as required by the contract, on all applicable projects. A surveillance review may include an assessment against some or all of the EIA-748, current version, requirements. The extent of the surveillance review will be tailored based on current conditions.

For contractors where there are applicable projects having a TPC of \$300 million or greater, PM may conduct a risk-based, data-driven surveillance as requested by the FPD, the Program, or the PME. Documentation of the surveillance will be provided to the contracting officer documenting the compliance status of the contractor's EVMS with EIA-748, current version, or as required by the contract.

9. Environment, Safety and Health Documentation Development.

- a. For projects involving Hazard Category 1, 2, or 3 nuclear facilities as defined in 10 CFR § 830, Subpart B:
 - (1) Prior to CD-1, a conceptual safety design report (CSDR) is developed to:
 - Document and establish a preliminary inventory of hazardous materials, including radioactive materials and chemicals;
 - Document and establish the preliminary hazard categorization of the facility;
 - Identify and analyze primary facility hazards and facility design-basis accidents;

- Provide an initial determination, based on preliminary hazard analysis, of safety class and safety significant structures, systems, and components;
 - Include a preliminary assessment of the appropriate seismic design category for the facility itself as well as safety significant structures, systems, and components;
 - Evaluate the security hazards that can impact the facility safety basis (if applicable); and
 - Include a commitment to the nuclear safety design criteria of DOE O 420.1, current version (or proposed alternative criteria).
- (2) At completion of the preliminary design phase, preliminary safety and design results are developed to reflect more refined analyses based on the evolving design and safety integration activities during preliminary design. The preliminary safety and design results should include the results of process hazards analyses and confirm or adjust, as appropriate, the items included in the CSDR.
- (3) Prior to CD-2, a preliminary documented safety analysis (PDSA) is prepared that updates and expands the safety information in the preliminary safety and design results and identifies and justifies any changes from the design approach described in the preliminary safety and design results. A plan to achieve operational readiness is prepared using the core requirements of DOE O 425.1 (current version).
- (4) Prior to CD-4, a documented safety analysis is developed based on information from the PDSA and the safety evaluation report. Technical safety requirements are developed to document and establish specific parameters and requisite actions for safe facility operation.
- (5) An ORR or RA will be conducted in accordance with DOE O 425.1, current version.
- b. For projects involving facilities that are below the Hazard Category 3 threshold as defined in 10 CFR § 830, Subpart B:
- (1) Prior to CD-1, prepare a preliminary hazard analysis report (PHAR) to identify and evaluate all potential hazards and establish a preliminary set of safety controls. Hazardous chemicals are analyzed in accordance with Integrated Safety Management requirements in DOE Policy (P) 450.4, current version, 29 CFR § 1910.119, and 40 CFR § 68.

- (2) Prior to CD-2, a hazard analysis report is developed by updating the PHAR to include any new or revised information on facility hazards and safety design. If the hazard characterization is below Hazard Category 3 by analysis, the Safety Basis Approval Authority (SBAA) should approve this analysis before CD-2.
 - (3) Prior to CD-3 and CD-4, hazard analysis and controls are updated in the hazard analysis report.
 - (4) The PSO will determine what level of readiness review will be conducted.
 - c. All projects must comply with environmental protection requirements including *National Environmental Policy Act* documentation, anticipated permitting requirements and cost-effective environmental stewardship, advance regional and local integrated planning goals and sustainable sites, and high performance and sustainable building principles.
 - d. A construction project safety and health plan is prepared prior to construction activities as required under 10 CFR § 851, Appendix A, section 1(d), unless a variance has been approved.
10. Integrated Project Team. The FPD shall organize and lead the IPT. The IPT is an essential element in DOE's acquisition process and is involved in all phases of a project. This team consists of professionals representing diverse disciplines with the specific knowledge, skills, and abilities to support the FPD in successfully executing a project. The team size and membership may change as a project progresses from CD-0 to CD-4 to ensure that the necessary skills are always represented to meet project needs. Team membership may be full- or part-time, depending upon the scope and complexity of a project and the activities underway. However, the identified personnel must be available to dedicate an amount of time sufficient to contribute to the IPT's success. Refer to DOE G 413.3-18, current version, for further clarification.

Qualified staff (including contractors) must be available in sufficient numbers to accomplish all contract and project management functions. Project staffing requirements should be based on a variety of factors, including project size and complexity, as well as the management experience and expertise of the project staff. Programs must use a methodology to determine the appropriate project team size and required skill sets. One such algorithm is detailed in DOE G 413.3-19, current version. Regardless of the methodology used, once the appropriate staff size has been determined, programs should plan and budget accordingly.

The FPD and the team will prepare and maintain an IPT Charter that describes:

- Membership (must include the contracting officer);
- Responsibilities and authority;
- Leads (as appropriate);

- Meetings;
- Reporting; and
- Operating guidance.

Nuclear safety experts on a nuclear facility project 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; and QA. This does not preclude personnel from other disciplines providing that they have relevant and appropriate nuclear safety experience for the functional area for which they are responsible.

11. Integrated Safety Management System (ISMS). An ISMS must be in place to ensure that potential hazards are identified and appropriately addressed throughout the project (refer to DOE P 450.4, current version). It will be used to systematically integrate safety into management and work processes at all levels. The project management team will implement the following seven guiding principles:
 - a. Line management responsibility for safety;
 - b. Clear roles and responsibilities;
 - c. Competence commensurate with responsibilities;
 - d. Balanced priorities;
 - e. For Hazard Category 1, 2, and 3 nuclear facilities, the CSDR must identify safety standards and requirements to include preliminary seismic design category for the facility itself as well as safety class and significant structures, systems, and components;
 - f. Engineered controls tailored to the functions being designed or performed; and
 - g. Tailoring should be applied to a project's ISMS to enable tasks to be managed at the appropriate levels that enable those closest to the task plan to assume responsibility for planning and performance. Refer to DOE P 470.1, current version, for more information.

12. Key Performance Parameters. A KPP is defined by CD-2 and is a characteristic, function, requirement, or design basis that, if changed, would have a major impact on the system or facility performance, schedule, cost, and/or risk. In some cases, a minimum KPP or threshold value should be highlighted for CD-4 (project completion) realizing in many instances full operational capabilities may take years to achieve. The minimum KPPs and facility mission must stay intact for the duration of the project since they represent a foundational element within the original PB. For NNSA projects, KPPs are also identified in the program requirements document. Additional details concerning the application of KPPs are provided in DOE G 413.3-5 (current version).
13. Lessons Learned Process. DOE O 210.2, *DOE Corporate Operating Experience Program*, current version, contains the requirements for the systematic review, identification, collection, screening, evaluation and dissemination of operating experience. This includes the requirement for submitting and sharing of lessons learned by PSOs, Heads of Field Elements, and DOE contractors. As such, lesson learned and best practices are to be captured throughout the continuum of a project. Lessons learned reporting allows the exchange of information among DOE users in the context of project management.

Individuals leading project peer reviews, or other reviews intended to meet the project peer review requirements in this Order (e.g., external independent review [EIR] or independent project review [IPR] in preparation for a CD action performed in lieu of the annual project peer review), will elicit lessons learned with potential Department-wide implications (e.g., those which may impact similar projects, or which may result in an update to an Order or Guide). Thereafter, they will enter elicited lessons learned into the lessons learned repository in the DOE lessons learned system of record, as described in DOE O 210.2, current version, prior to completing their review reports.

Within 90 days of CD-3 approval, the lessons learned during up-front project planning and design not previously recognized shall be submitted by FPDs to the DOE Lessons Learned System of record, as described in DOE O 210.2, current version. FPDs will submit to the DOE Lessons Learned System of record, as described in DOE O 210.2, current version, additional lessons learned (e.g., project execution and facility startup lessons learned) recognized since the last project peer review within 90 days of their projects attaining Critical Decision (CD)-4, Approve Start of Operations or Project Completion.

14. Nuclear Facilities: Safety Design Strategy (SDS) and Code of Record. Early in the conceptual design phase, an SDS should be developed for Hazard Category 1, 2, and 3 nuclear projects. The SDS provides preliminary information on the scope of anticipated significant hazards and the general strategy for addressing those hazards. The SDS is updated throughout subsequent project phases and should contain enough detail to guide design on overarching design criteria; establish major safety structures, systems, and components; and identify significant project risks associated with the proposed facility relative to safety.

Consistent with this Order, DOE O 420.1 (current version), and DOE-STD-1189-2016 for nuclear facilities, adequate resources shall be provided to develop an SDS and a code of record early in the design phase. The code of record shall be maintained throughout the CD process and for the remainder of the nuclear facility's life cycle. The code of record shall serve as the management tool and source for the set of requirements that are used to design, construct, operate, and decommission nuclear facilities over their lifespans.

15. Performance Baseline. The PB, as established in the PEP, defines the TPC, CD-4 completion date, performance, and scope commitment to which the Department must execute a project and is based on an approved funding profile. The PB includes the entire project budget (total cost of the project that includes contingency) and represents DOE's commitment to Congress and the OMB. The approved PB must be controlled, tracked and reported from the beginning to the end of a project to ensure consistency between the PEP, the PDS, and the business case (a requirement of OMB Circular A-11).
16. Planning and Scheduling. Projects shall develop and maintain an integrated master schedule (IMS). The IMS shall be developed, maintained, and documented in a manner consistent with methods and the best practices identified in the *Planning and Scheduling Excellence Guide*, published by the National Defense Industrial Association, and the GAO-16-89G, Schedule Assessment Guide.
17. Project Definition Rating Index (PDRI). The project team will perform comprehensive front-end project planning to an appropriate level before establishing a PB at CD-2. The PDRI model assists the IPT in identifying key engineering and design elements critical to project scope definition. PDRI is to be implemented and used for projects with a TPC of \$300 million or greater, as appropriate. This will be accomplished by the FPD. While not mandated, it is strongly encouraged for use by Programs for projects with a TPC less than \$300 million. See DOE G 413.3-12, current version, for additional information.
18. Project Execution Plan. The PEP is the core document for the management of a project. The FPD is responsible for the preparation of this document. It establishes the policies and procedures to be followed to manage and control project planning, initiation, definition, execution, and transition/closeout and uses the outcomes and outputs from all project planning processes, integrating them into a formally approved document. It includes an accurate reflection of how the project is to be accomplished, the minimum KPPs for CD-4, resource requirements, technical considerations, risk management, configuration management, and roles and responsibilities. A preliminary PEP is required to support CD-1. This document continues to be refined throughout the duration of a project and revisions are documented through the configuration management process. Key elements of a PEP are provided in DOE G 413.3-15, current version.
19. Project Funding.
 - a. Incremental Funding. Project budget requests should consider mitigating risks such as continuing resolutions (particularly for new starts), higher than anticipated project burn rate and affordability within the program's capital and operations budget portfolio.

- b. Funding Profiles. In approving the funding profile for completing the project, PME's must determine that the proposed funding stream is affordable and executable within the program's capital and operations budget portfolio. Any changes to the approved funding profile that negatively impact the project after CD-2 must be endorsed by the project's PME, who may not be the Program Budget Officer. Prior to endorsement by the PME, the CFO and PM will be notified of any proposed project funding profile changes so that the CFO can verify that the funding profile is covered within the President's budget.
- c. Funding Documents. All projects, except for major items of equipment, will provide to the CFO and the PM a project funding document (inclusive of the PDS for line-item projects) that clearly delineates the budget year funding request, prior years' budget requests and appropriations, and future planned budget requests. Consistent with current budget submission requirements, the PDS for line-item projects will be included in the Department's Congressional budget submission.

The project funding document (similar to PDS) for operating expense projects will be considered internal information for the CFO, PM, and appropriate senior leaders during the budget preparation process to document that project funds are being requested consistent with the funding profile established at CD-2, or the latest BCP that was approved.

- d. Project Engineering and Design Funds. To enhance fiscal insight and discipline for major system projects, an estimate of the required amount of PED funds to execute the planning and design portion of a project (period from CD-1 to completion of the project's design) shall be included in the CD-1 documentation.

For projects where the top-end range is less than \$100 million, the use of PED funds shall be limited to a 2-year duration, unless approved by the PME. The PMRC shall be notified of granted time extensions or waivers. The estimate will be subject to applicable independent reviews.

- e. Align Priorities to Program Appropriations. Each program office shall develop an integrated capital asset project priority list as a corporate tool to enable DOE leadership to optimize limited budget resources. The priority list shall be updated at least annually and should rank mission needs that are achieved by each capital asset project and identify project drivers, internal and external factors for ranking the projects. The prioritization should be reflected in the annual fiscal guidance.

20. Project Reporting, Assessments, and Progress Reviews.

- a. Project Reporting. PARS is the central repository for key Departmental-level project information. PARS enables receipt of cost and schedule data in the format specified in the contract to ensure consistency across the federal government and deploy improved cost and schedule analysis tools in support of PARS updates, the contractor will provide the FPD with relevant performance reporting information at the control account level.

The Program Offices and FPDs will ensure that project data is uploaded monthly into PARS. Approval of CD-0 initiates a requirement for project status reporting. This reporting continues through completion of the PMB for all projects with a TPC greater than the minor construction threshold or \$50 million, whichever is higher. The PSO will submit key project documentation such as CD and BCP approval memoranda to PM within 5 business days of document approval.

At CD-2 and continuing through completion of the PMB, projects with a TPC greater than the minor construction threshold or \$50 million (whichever is higher) must report project performance in PARS no later than the last workday of every month. The data must be current as of the closing of the previous month's accounting period.

The information in PARS must accurately reflect current project status and provide acceptable forecasts to facilitate project management and decision-making processes. Accordingly:

- The FPD must assure project cost and schedule performance reflect reality. Early warning indicators are essential. Monthly estimates at completion (EACs) are a must, including a separate EAC, or forecasted TPC, provided by the FPD.
- The contractor must be held accountable for providing timely, accurate, reliable and actionable project and contractor cost, schedule, performance, risk, and forecast data, reports, and information. The IPT must be accountable for its oversight and validation of the data.
- Contracts should be structured so as to minimize cost overrun exposure. When significant PB cost BCPs occur that generate a new TPC, the FPD and contracting officer shall work together to consider a revised cost share proposition moving forward. In addition, the FPD and contracting officer shall work together to ensure the contracts include appropriate requirements for complete, accurate and timely reporting with appropriate requirements analysis to support the contractor's monthly estimates of project completion cost and schedule.

- b. Project Assessments. The FPDs have until the third business day of the month following receipt of the contractor's monthly report to accomplish their upload of performance data and assessment. The program managers have until the sixth business day and PM until the ninth business day to provide their assessment and to compile the monthly project status report. PM will coordinate the report with the programs and on the twenty-fifth business day, forward the report to the Deputy Secretary.

Project performance assessments shall be determined through quantitative and qualitative methods. Elements to be reviewed include, but are not limited to EVMS data; contractor's monthly reports; acquisition management practices; risk management status; EIRs, IPRs, TIPRs, and project peer reviews; site visits; staffing assessments; and budget submittals, as well as discussions with the IPT members.

PM will provide project assessments for all capital asset projects in its monthly reports to the Deputy Secretary. Ratings shall be assessed against the current approved PB:

- Green. Project is expected to meet its current PB.
- Yellow. Project is potentially at risk of not meeting an element of the current PB.
- Red. Project is highly at risk of requiring a change to the PB by the PME or is not being executed within the AS and PEP.

- c. Project Progress Reviews. Quarterly Project Reviews (QPRs) must be conducted with the applicable PME or their designee. Participation by the PME is strongly encouraged at all QPRs. However, when it is not possible, the PME can delegate the review. In no case should it be delegated beyond two consecutive quarters for projects post-CD-2. The CE may delegate QPRs for major system projects to the Under Secretaries. PMSO must be provided all QPR reports and invited to participate in QPRs for all projects with a TPC greater than or equal to \$300 million. Also, PMSO will serve as Secretariat for CE QPRs.
21. Project Scope. Capital asset project scope determinations shall adhere to federal statutes, regulations, policy, and guidance. Specifically, determinations shall comply with the OMB's Circular A-11 and associated Capital Programming Guide. Capital asset project decisions shall be made based on clearly defined scope and the nature and type of work to be completed and shall include all the project-specific work scope needed to achieve a complete and usable asset and accomplish the defined mission need using proper project segmentation or project phasing. The cost of operational activities that occur solely to support accomplishment of the capital asset project between CD-0 and CD-4 are to be included in the project's TPC. Refer to DOE *Work Breakdown Structure Handbook*.
22. Quality Assurance. QA begins at project inception and continues through all phases of the project. The FPD is responsible for a Quality Assurance Program (QAP) for the project and all applicable QA requirements must be addressed. Apply American Society of Mechanical Engineers Nuclear Quality Assurance (NQA)-1-2008 (edition) and NQA-1a-2009 (addenda) for Hazard Category 1, 2, or 3 nuclear facilities. The key elements of a QAP are provided in DOE O 414.1, current version, and 10 CFR § 830, Subpart A. (See also DOE G 413.3-2, current version.)

23. Reviews. Reviews are an important project activity and must be planned as an integral part of the project and tailored appropriately to project risk, complexity, duration and CD or phase. Refer to DOE G 413.3-9, current version, for more information. The following is a summary of key reviews organized by CD.

a. Prior to CD-0.

- (1) Mission Validation Independent Review. A Mission Validation Independent Review, performed by the PSO, is a limited review prior to CD-0 for major system projects. It validates the mission need and the rough-order-of-magnitude (ROM) cost range that is provided, in part, to properly designate the appropriate PME. A value study may also be conducted, as appropriate, to assist in CD-0. Refer to DOE G 413.3-17, current version.
- (2) Mission Need Statement Document Review. PM will review the MNS document and provide a recommendation to the PSO for projects with a TPC greater than or equal to \$300 million. The review shall be completed within 10 days after the submission for non-major system projects and within 25 days for major system projects.
- (3) Independent Cost Review. For major system projects, or for projects as designated by the CE, PM will conduct an ICR. This review validates the basis of the ROM cost range and provides an assessment of whether the range reasonably bounds the alternatives to be analyzed in the next project phase. It also determines the PME authority designation.

b. Prior to CD-1.

- (1) Acquisition Strategy Review. ASs for major system projects must be sent to the ESAAB Secretariat for review by PM prior to scheduling CD-1 decisional briefings. The FPD and CO must concur with the AS prior to the PM review. Within 10 days upon receipt, PM will provide a recommendation to the appropriate PSO who holds approval authority. Approval of the AS does not constitute approval of the AP. The AP must be submitted for review and approval in accordance with established procurement procedures including DOE Acquisition Guide, Chapter 7.1.

- (2) Independent Project Review. For Hazard Category 1, 2, and 3 nuclear facilities, the PSO will conduct an IPR to ensure early integration of safety into the design process. The review must: (a) ensure that safety documentation is complete, accurate and reliable for entry into the next phase of the project; (b) evaluate whether the preferred alternative process and facility design, and corresponding safety analyses, are sufficiently detailed to identify any safety controls that, because of cost, maintainability, complexity or other limiting characteristics, could significantly impact the decision to select the preferred alternative; and (c) validate that the IPT charter has identified appropriate functions, roles, and responsibilities for members needed to support nuclear safety, and that the IPT members supporting nuclear safety are appropriately qualified and have the availability to meet their responsibilities. The PSO approval of IPRs, specified in Appendix A, Table 2 means that the Program Office and FPD jointly request the review, establish the review scope and schedule, and select a team leader.

CNS or CDNS concurrence, as appropriate, is required for reviews of projects that must implement DOE-STD-1189-2016. The team leader is the approval authority for the review plan (including the criteria and review approach documents) and for the final review report.

- (3) Conceptual Design Review. Conceptual design review must be conducted for all projects and involve reviewers external to the project using a formalized, structured approach to ensure that the reviews are comprehensive, objective, and documented.
- (4) Technology Readiness Assessment (TRA). For major system projects or first-of-a-kind engineering endeavors, the IPT shall complete a TRA and technology maturation plan, as appropriate. These assessments are also encouraged for lower cost projects where new technologies may exist.
- (5) Independent Cost Estimate and/or Independent Cost Review. For projects with a TPC greater than or equal to \$300 million, PM will develop an ICE and/or conduct an ICR, as they deem appropriate. This review validates the basis of the preliminary cost range for reasonableness and executability. It also includes a full accounting of life-cycle costs to support the alternative selection process and budgetary decisions.

c. Prior to CD-2.

- (1) DOE Review of Preliminary Safety and Design Results. For Hazard Category 1, 2, and 3 nuclear facilities, DOE conducts an independent review of the preliminary design and safety results to determine whether final design should proceed. The review may consist of a single review or a series of reviews, based on when the preliminary design of the facility (or of defined segments of the design) is complete and ready to enter final design. This review is conducted by a DOE-selected team of experts and its results provided to the FPD for review and action as necessary. The size and composition of the team reflects the size and complexity of the project. More than one review may be conducted at the discretion of the FPD; the SDS should define segments when more than one review is planned. Independent reviews should be scheduled as early as practicable, after completion of preliminary design, to minimize project risk. This review may be handled by the TIPR as long as the appropriate experts are part of the review team. Refer to DOE-STD-1104-2016 for the required method for DOE personnel to review and approve the preliminary design and safety results.
- (2) Technical Independent Project Review. For Hazard Category 1, 2, and 3 nuclear facilities, a TIPR will be performed to ensure that safety is effectively integrated into design and construction. The TIPR must:
(a) ensure that safety documentation is complete, accurate and reliable for entry into the next phase of the project and (b) evaluate the IPT to ensure that appropriate team member functions to support nuclear safety during final design have been established, and appropriately qualified team members have been selected and have needed availability to address nuclear safety-related matters during final design.

Completion of the TIPR is required at or near the completion of preliminary design, and prior to the start of any subsequent reviews (including EIRs) and is required prior to CD-2 approval. The PSO approval of TIPRs, specified in Appendix A, Table 3 means that the Program Office and FPD jointly request the review, establish the review scope and schedule, and select a team leader.

CNS or CDNS concurrence in CD-2 approval is required for reviews of projects that must implement DOE-STD-1189-2016. The team leader is the approval authority for the review plan (including the criteria and review approach documents) and for the final review report.

- (3) Performance Baseline Validation Review. A performance baseline validation review is required to provide reasonable assurance that the project can be successfully executed. IPRs are required to validate the PB for projects with a TPC less than \$300 million. The PME may request an EIR in lieu of an IPR through PM and shall do so if the PME has no PMSO to perform the review. For all projects with a TPC greater than or equal to \$300 million, PM will conduct an EIR and develop an ICE in support of the PB validation. Findings resulting from project reviews must be addressed by the IPT in their corrective action plan and expeditiously resolved. Follow-up reviews to validate finding resolution may be required at the discretion of the reviewing entity.
 - (4) Project Definition Rating Index Analysis. For projects with a TPC greater than \$300 million, the FPD shall conduct a PDRI analysis. Such analyses are also encouraged for projects with a TPC less than \$300 million.
 - (5) Technology Readiness Assessment. For major system projects or first-of-a-kind engineering endeavors, the IPT shall complete a TRA and technology maturation plan, as appropriate. These assessments are also encouraged for lower cost projects where new technologies may exist.
 - (6) Preliminary Design Review. Preliminary design review must be conducted for all projects and involve reviewers external to the project using a formalized, structured approach to ensure that the reviews are comprehensive, objective, and documented.
 - (7) Final Design Review. Final design review must be conducted for all Hazard Category 1, 2, and 3 nuclear facilities and involve reviewers external to the project using a formalized, structured approach to ensure that the reviews are comprehensive, objective, and documented.
- d. Prior to CD-3.
- (1) Construction or Execution Readiness Review. An EIR must be performed by PM on major system projects to verify construction or execution readiness.
 - (2) Independent Cost Estimate. For projects with a TPC greater than or equal to \$100 million, PM will develop an ICE.
 - (3) EVMS Certification Review. For contracts where there are applicable projects with a TPC greater than \$300 million, PM may conduct the certification review.
 - (4) Technology Readiness Assessment. For major system projects where a significant critical technology element modification occurs subsequent to CD-2, a TRA will be conducted, as appropriate.

- (5) Final Design Review. Final design review must be conducted for all non-nuclear facilities and less than Hazard Category 3 nuclear facilities and involve reviewers external to the project using a formalized, structured approach to ensure that the reviews are comprehensive, objective, and documented.
 - e. Prior to CD-4.
 - (1) Operational Readiness Review or Readiness Assessment. Conduct an ORR or RA for Hazard Category 1, 2, and 3 nuclear facilities in accordance with DOE O 425.1 (current version).
 - (2) Readiness to Operate Assessment. For non-nuclear projects, conduct a formal assessment of the project's readiness to operate, as appropriate. Determine the basis for DOE acceptance of the asset and if the facility or area can be occupied from both a regulatory and work function standpoint. Establish a beneficial occupancy and utilization date for the facility and/or equipment.
24. Project Peer Reviews. These focused, in-depth reviews are conducted by non-advocates (federal and M&O or other contractor experts) and support the design and development of a project. The frequency of reviews is based on project complexity and project performance. For projects \$300 million or greater (or lower as deemed appropriate by the Under Secretaries), Project Assessment Offices that have direct line of responsibility to the appropriate Under Secretary shall conduct a project peer review between CD-0 and CD-1, annually between CD-1 and CD-2, at least annually between CD-2 and CD-4 and more frequently for the most complex projects or those experiencing performance challenges. The reviews should be performed by peers (with relevant experience and expertise) independent of the project, to evaluate technical, managerial, cost, scope and other aspects of the project, as appropriate. Each Under Secretary shall ensure that the peer reviews have independence from line management and, to the greatest extent possible, use experts who are familiar with the projects to ensure continuity for future reviews.

The review teams will be established with the Department's most talented project, contract and technical staff from across the complex. This includes both federal and contractor personnel from within and across Program Offices, which will benefit from this cross-fertilization by learning from each other. Individuals leading project peer reviews or other reviews intended to meet the project peer review requirements in this Order will elicit lessons learned with potential Department-wide implications and enter them into the DOE Lessons Learned System of record, as described in DOE O 210.2, current version, prior to completing their review reports.

There should be no contractual or budgetary impediments to accomplishing these reviews, which are fundamental to the professional development of each and every member of both the project team and the review team. The knowledge and lessons learned that our project management professional's gain with each review is invaluable. Project management professional development and departmental knowledge management is the ultimate result; enhancements to project execution performance over time are the by-product. Indirect accounts at the contributing sites should cover these allowable costs.

25. Risk Management. Risk management is an essential element of every project and must be analytical, forward looking, structured, and continuous. Risk assessments are started as early in the project life cycle as possible and should identify critical technical, performance, schedule, and cost risks. Once risks are identified and prioritized, sound risk mitigation strategies and actions are developed and documented in the risk register. Post-CD-1, the risk register (including new risks) should be evaluated at least quarterly.

Risks and their associated confidence levels are dependent on multiple factors, such as complexity, technology readiness, and strength of the IPT. Risks for all capital asset projects should be analyzed using a range of 70–90% confidence level upon baselining at CD-2 and reflected in funded contingency, budgetary requests, and funding profiles. If a project has a PB change, FPDs should consider reanalyzing the risks at a higher confidence level and then reflecting this in budgetary requests and funding profiles.

26. Safeguards and Security. Prior to CD-1, general safeguards and security requirements for the recommended alternative and preliminary identification of alternatives (including facility design and the incorporation of safeguards and security technologies) must be made, and these alternatives evaluated, with respect to their impact on mission needs, satisfaction of other requirements (such as safety requirements) and other cost considerations. This input becomes part of the conceptual design requirements for further development.

Prior to CD-1, a preliminary security risk assessment must be conducted that accounts for the set of applicable safeguards and security requirements, evaluates the methods selected to satisfy those requirements and addresses any potential risk acceptance issues. The PEP and the PB must be reviewed to ensure that cost, schedule, and integration aspects of safeguards and security are appropriately addressed, all feasible risk mitigation has been identified, and concerns for which explicit line management risk acceptance will be required are appropriately supported.

Prior to CD-3, a final security risk assessment report should be issued addressing all the safeguards and security requirements of the project. The project requirements should be satisfied by the facility design or the proposed operational features.

27. Tailoring.

a. General.

Tailoring is an element of the acquisition process and must be appropriate considering the risk, complexity, visibility, cost, safety, security, and schedule of the project. Tailoring must be identified as early as possible prior to the impacted CD and must be approved by the PME. In the tailoring strategy or the PEP, the FPD will identify those areas in which a project is planned to be tailored as well as an explanation and discussion of each tailored area.

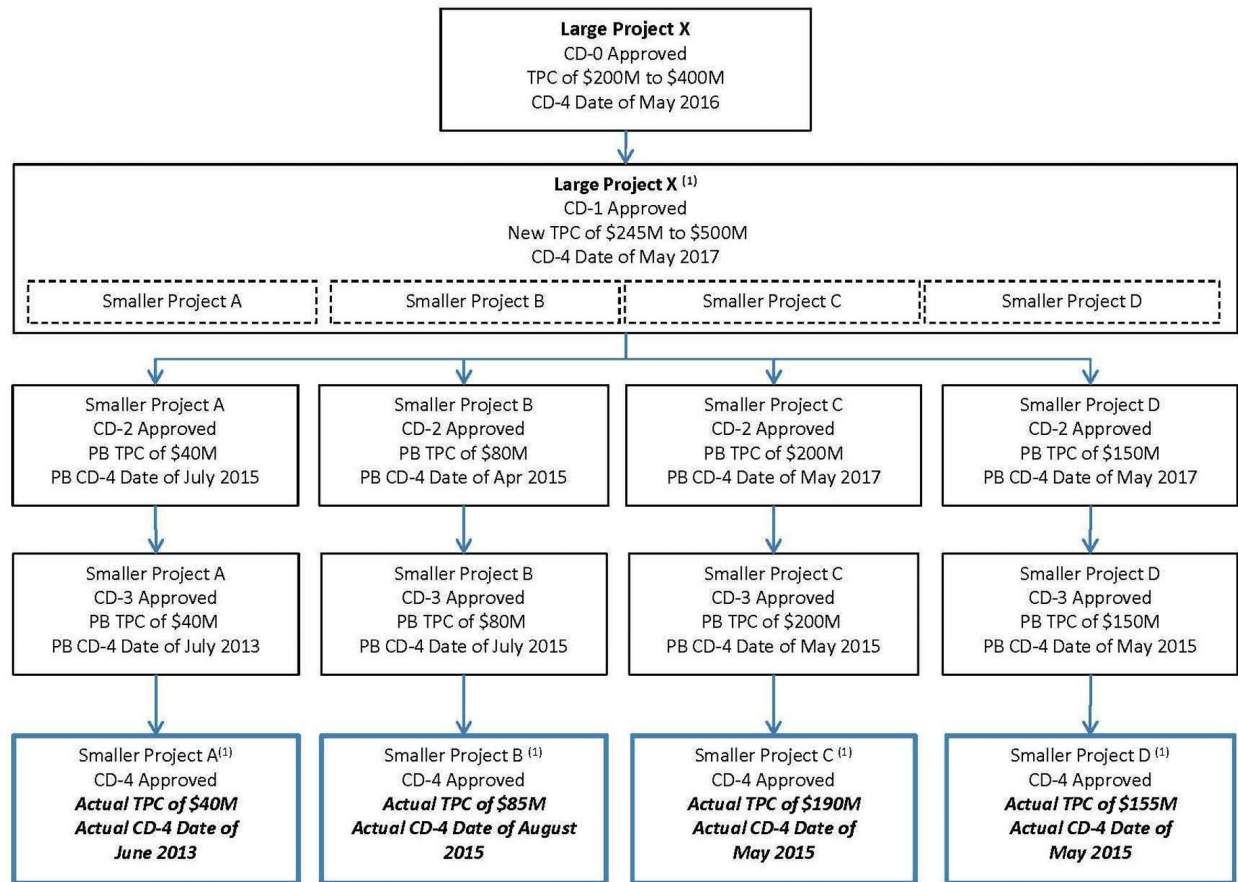
Tailoring does not imply the omission of requirements in the acquisition process or other processes that are appropriate to a specific project's requirements or conditions.

Tailoring may involve consolidation or phasing of CDs, substituting equivalent documents, graded approach to document development and content, concurrency of processes, or creating a portfolio of projects to facilitate a single CD or AS for an entire group of projects. Tailoring may also include adjusting the scope of IPRs and EIRs, delegation of acquisition authority and other elements. Major tailored elements such as consolidating or phasing CDs or delegation of PMEs should be specified in the PEP or the tailoring strategy.

Tailoring does not apply to nuclear safety requirements, which use a "graded approach" as prescribed in 10 CFR § 830. Details on developing a tailoring approach that could be applied are provided in DOE G 413.3-15, current version.

b. Phasing.

Generally, a CD would not be split, and CD-2 is never split. For some projects, it may be appropriate to phase the work (into smaller, related, complete, and usable subprojects) and split or phase the CD. In those instances, it may be appropriate to garner CD-0 and CD-1 approvals for all the smaller projects collectively and simultaneously. Subsequently, each smaller project must have its own distinct performance baseline (CD-2) with clearly defined and documented technical scope, cost, schedule and funding profile including consideration for all applicable contingencies. See Figure 2.



(1) Projects notated will be those tallied for project success metric.

Figure 2: Phasing of a large project into subprojects

As each smaller project achieves CD-2, its cost baseline (or TPC) gets reflected as point estimates, but the TPC of the large project is a collective total of the smaller projects, with the expectation that it is less than the CD-1 high end range. After each phased CD-2 is approved, the earned value for each smaller project individually must be reported into PARS monthly, as applicable, based on TPC. When a smaller project is developed, the subsequent CDs will be approved by a PME commensurate with that project's TPC.

Although funded contingency is included as part of each smaller project's TPC, during execution, it may be held at the large project level and utilized as risks are realized. Contingency becomes part of the smaller project or an activity after the approval of the baseline change request to utilize contingency. Cost savings from one small project can be returned to the contingency pool for other small projects covered by the same PDS. These additional contingency funds can be applied toward another small project, if necessary. The large project (aggregated) CD-2 value is finally established when the last small project achieves CD-2 approval. At that time, the large project's CD-2 value equals the total value of each of the original CD-2 values for each of the smaller projects combined. The project success metrics are based on the execution of each of the small projects.

For construction projects that collectively support one mission need, it would be advisable to include each project on one PDS to achieve maximum funding flexibility. Examples 1–4 outline how a time-phased, multiple-project PDS can be developed.

Example 1: Initial Budget Request for PED Funds

	Construction Cost (\$M)		PED Cost (\$M)				
	CD-0 or CD-1 (TPC Cost Range)	TPC	FY11	FY12	FY13	FY14	FY15
Project A	20–50	-	5	-	-	-	-
Project B	50–100	-	10	-	-	-	-
Project C	100–200	-	10	10	-	-	-
Project D	75–150	-	-	15	-	-	-
TOTAL	245–500	-	25	25	-	-	-

Example 2: Initial Budget Request for Construction, Project A (with CD-2 Approval) and Project B (absent of CD-2)

	Construction Cost (\$M)						
	CD-0 or CD-1 (TPC Cost Range)	TPC	FY11	FY12	FY13	FY14	FY15
Project A	-	40	-	-	40	-	-
Project B	50–100	100	-	-	10	50	40
Project C	100–200	-	-	-	-	-	-
Project D	75–150	-	-	-	-	-	-
TOTAL	-	140	0	0	50	50	40

Example 3: Initial Budget Request for Construction, Projects A & B (with CD-2 approval) and Projects C & D (absent of CD-2)

	Construction Cost (\$M)						
	CD-0 or CD-1 (TPC Cost Range)	TPC	FY11	FY12	FY13	FY14	FY15
Project A	-	40	-	-	40	-	-
Project B	-	80	-	-	10	50	20
Project C	100–200	200	-	-	-	100	100
Project D	75–150	150	-	-	-	25	125
TOTAL	-	470	0	0	50	175	245

Example 4: Initial Budget Request for Construction (All Projects with CD-2 Approval)

	Construction Cost (\$M)						
	CD-0 or CD-1 (TPC Cost Range)	TPC	FY11	FY12	FY13	FY14	FY15
Project A	-	40	-	-	40	-	-
Project B	-	80	-	-	10	50	20
Project C	-	200	-	-	-	100	100
Project D	-	140	-	-	-	25	115
TOTAL	-	460	0	0	50	175	235

Likewise, it may be appropriate to split CD-4. For example, “CD-4A” to designate beneficial occupancy of a facility in advance of operations start up, particularly if there is a significant time lapse.

c. Environmental Management Cleanup Projects.

Office of Environmental Management (EM) cleanup projects are frequently the antithesis of construction projects in that EM is deactivating, decommissioning, remediating, stabilizing, and disposing (also known as environmental restoration) versus constructing. These projects are conducted under a variety of regulatory processes and site-specific cleanup agreements which are legally binding and specify the process, end states, decision points and approvals required. The TRAs plays an important role in determining the solution. For these projects, the performance and scope parameters and start/end dates are based on negotiated terms with federal and/or state regulatory agencies. As a result of this variability, it is not possible to draw a single crosswalk to the traditional construction project that would be applicable to all EM cleanup projects. Hence, a tailored approach is necessary for each project. As such, the FPD will submit a tailoring strategy, which may be included in the PEP, to the PME for approval. For demolition projects performed by the EM, Appendix D replaces Appendix A and modifies applicable elements in Appendices B and C. See DOE G 413.3-15, current version, for additional guidance.

d. Design-Build.

Design-build is a project delivery method whereby a single contract is awarded for both design and construction. Design-build is normally used most successfully with projects that have well-defined requirements with limited complexity and risks. Example projects include road building, administrative facilities and/or replication of previously accomplished projects. The nuclear safety requirements of this Order will be fully implemented for defense nuclear facilities.

(1) The design-build approach requires the development of a functional design and clearly stated operating requirements that provide sufficient information to allow prospective contractors to prepare bids or proposals. It also allows the flexibility to implement innovative design and construction approaches, VE, and other cost and time savings initiatives. The overall objective of the design-build approach is to:

- Enhance efficiencies in project design integration into construction execution;
- Reduce the total cost to the Department; and
- Deliver projects faster than by using the traditional design-bid-build approach.

- (2) Because the requirements are well-defined early in the process, and much of the cost and schedule information and key design criteria are known, CD-1, CD-2 and/or even CD-3 may be accomplished simultaneously. Essentially, in requesting a simultaneous approval, CD-1/2, CD-1/2/3 or CD-2/3, the IPT is asserting that:

- There is no advantage to the Department of further evaluation of alternatives;
- The project functions and requirements are well known; and
- A cost and schedule baseline can be established.

e. Long-Lead Procurement.

CD-3A may be needed for long-lead item procurement. While there is potential risk in procuring equipment before the design is complete, the potential schedule improvement may be significant and more than compensate for the risk. If the long-lead item is nuclear safety-related or nuclear safety-related equipment, safety document maturity must also be considered (refer to DOE-STD-1189-2016 and DOE-STD-1104-2016). Procurement of vendor engineering designs, for example, greatly reduces the risk of incomplete or incorrect final designs that would otherwise require rework and potentially impact cost and schedule. The need to phase CD-3 should not be confused with minor, early activities that are necessary and generally performed prior to CD-3. Activities such as site preparation work, site characterization, limited access, and safety and security issues (i.e., fences) are often necessary prior to CD-3 and may be pursued as long as project documents such as a PDS requesting construction or PED funds to procure the long-lead items and funding approvals are in place. If CD-3A is anticipated, the need for this decision and the process should be documented in the PEP or tailoring strategy.

28. Site Development Planning. Projects including new construction or modifications to real property assets shall be included in the site's Ten-Year Site Plan and must provide the necessary documentation to establish a property record in the Department's Facilities Information Management System in accordance with DOE O 430.1 (current version).

29. Technology Readiness Assessment.

The TRA model evaluates technology maturity using the TRL scale. TRAs and associated Technology Maturation Plans are used as a project management tool to reduce the technical and cost risks associated with the introduction of new technologies. Where technological readiness is a significant concern, TRAs should be considered for alternatives under consideration.

Major system projects or first-of-a-kind engineering endeavors must be assessed prior to each CD using the TRA and should achieve the following minimum TRL scores for each critical technology item or system as determined by an independent review team outside of the project team before that CD can be approved. The higher the TRL at CD-2, the lower the risk to the project. The PME must provide justification to the ESAAB if pursuing a TRL less than 7 at CD-2, which in turn will notify the CE. The following represents the minimum TRL at each CD:

- CD-1: TRL 4.
- CD-2: TRL 7.

For major system projects where new critical technologies are being deployed, the TRA shall be conducted and the associated technology maturation plan developed prior to CD-2. On those projects where a significant critical technology element modification occurs subsequent to CD-2, conduct another TRA prior to CD-3. It is strongly encouraged for use by the PME for projects with a TPC less than \$1 billion. See DOE G 413.3-4, current version, for additional information.

APPENDIX D
OFFICE OF ENVIRONMENTAL MANAGEMENT CLEANUP PROJECT
MANAGEMENT PROTOCOL AND IMPLEMENTATION STANDARD FOR
DEMOLITION PROJECTS

1. OBJECTIVE.

The objective of this appendix is to establish tailored project management requirements that are applicable to Office of Environmental Management (EM) demolition projects and consistent with Appendices A, B and C of this Order. These demolition projects differ from traditional capital asset projects, namely construction projects, in that they do not necessarily result in a tangible asset (but instead result in reduction of future liabilities) and are generally funded using operating, versus line-item, funds.

Additionally, established regulatory processes frequently govern the initiation and definition phases of the projects. Demolition projects differ from deactivation and decontamination efforts, which are undertaken to remove physical, chemical, and radiological hazards and material-at-risk that would prevent the safe and efficient razing of the building or structure. Demolition projects typically involve the concerted, large-scale destruction and removal of a facility or structure already placed in a stable, de-energized configuration as a result of the completed deactivation and decontamination efforts. The precise conditions of this configuration will vary depending on the demolition approach and final end state selected. However, typical conditions may include making a criticality event “incredible” under normal and credible abnormal conditions, including those initiated by design-basis events, or removal of sufficient material-at-risk to prevent a release above applicable safety basis or air quality thresholds, while balancing the benefits of further deactivation and decontamination work with the objective of limiting radiation exposures to those levels that are as low as reasonably achievable (ALARA) according to DOE Orders.

This protocol establishes the requirements for planning, decision making, execution, performance measurement, and reporting of demolition projects. The requirements described herein follow a comparable level of rigor to those described in the remainder of this Order but are designed to address the unique aspects of demolition projects. The demolition of facilities does not require the same design elements as construction.

Further, demolition projects are often conducted subject to a regulatory framework including court orders, decrees, or site-specific cleanup agreements that are legally binding and may involve their process, schedule, alternative selection, technical approaches, scope, end states, decision points and approvals. The work is frequently covered by a record of decision (ROD) or action memorandum. For these projects, the performance and scope parameters and start/end dates may be based on negotiated terms with federal and/or state regulatory agencies and other stakeholders. These regulatory processes and agreements provide equivalency to some standard project management requirements. This protocol establishes a standard approach to comply with tailored project management requirements specifically related to demolition projects within the framework of this Order by allowing substitution of equivalent processes and consolidating Critical Decision (CD) phases. Tables are provided that summarize the

tailored requirements for CD-0/1 (Document Mission Need/Alternative Selection and Cost Range), CD-2/3 (Approve Performance Baseline/Start of Demolition Activities for EM Demolition Projects), and CD-4 (Approve Project Completion) for these projects.

Additional approval to utilize this protocol is not required.

2. APPLICABILITY.

This protocol applies to demolition work performed by EM, whether at EM-managed sites or on behalf of another organizational entity at a site controlled by that entity (e.g., National Nuclear Security Administration, Naval Reactors, and Office of Science).

This protocol applies to contracts and task orders to be awarded after the effective date of the protocol. Application of this protocol to capital work on contracts awarded prior to the effective date of the protocol will be evaluated on a case-by-case basis.

This protocol applies to demolition projects with a total project cost (TPC) greater than the minor construction threshold or \$50 million, whichever is higher, although Integrated Project Teams (IPTs) for demolition projects with a TPC less than \$50 million are encouraged to follow this appendix.

This protocol does not apply to EM construction projects. All EM construction projects with a TPC greater than the minor construction threshold or \$50 million, whichever is higher, are subject to Appendices A, B and C of this Order. All EM construction projects with a TPC less than \$50 million are subject to the policy memorandum with the subject “Office of Environmental Management Policy for Management of Capital Asset Projects with Total Project Costs (TPC) equal to or less than \$50 million,” from Assistant Secretary for Environmental Management, Anne White, dated August 31, 2018, and any subsequent revisions or replacements of that policy.

3. DEFINITIONS.

Definitions for many of the common terms used in this appendix may be found in Attachment 2 of this Order.

4. OVERVIEW OF EM DEMOLITION PROJECTS AND RELATIONSHIP TO PROJECT MANAGEMENT.

Demolition projects comprise the majority of projects performed by EM within the EM Program, exclusive of line-item construction, information technology projects, and major items of equipment. Many demolition projects use operating funds and are suited to the use of a project management approach. Demolition projects may involve cleanup of large facilities or complexes, thus defining the scope as precisely as possible allows for discrete work activities to be performed and measured to reduce risks. Some key characteristics of these projects include:

- A “temporary endeavor undertaken to create a unique product, service, or result” (Project Management Institute [PMI] 2017);

- An effort undertaken to meet specific performance objectives within a defined schedule, cost and in accordance with key performance parameters (KPPs);
- A specific scope of work with definitive start and end points and which can be practically measured; or
- An activity that is non-repetitive.

While EM may utilize any appropriate contract vehicle, task order contracts may provide the ability to improve project management performance. Federal teams should consider how best to package their site program and/or projects within a task order or series of task orders, if possible. Disaggregation of site program work into smaller, discrete work activities is encouraged because it provides better project definition and clarity, is more manageable, reduces time horizons and risks, and is consistent with the project management best practices found in this Order. The contract mechanism utilized shall establish the project performance measurement baseline (PMB) within the contract cost target (the contract budget base). Once that contract cost target is established (which includes PMB and management reserve [MR]), the addition of fee and federal contingency establishes the TPC. Funding profiles for federal contingency should be interwoven into the budget for the applicable Congressional control points, just as MR is included in contractor's contract cost targets. The CD-4 project completion date is established by the contract schedule target including contractor schedule reserve and DOE schedule contingency, or by the project component within the task order.

5. OVERVIEW OF EM DEMOLITION PROJECT CRITICAL DECISIONS.

When established regulatory or congressional processes govern the initiation and definition phases of demolition projects, the regulatory processes, combined with the EM Mission Statement and specific applicable legislation, satisfy the mission need and dictate the alternative selection process. In this case, the regulatory processes provide equivalency for CD-0 and CD-1. The life-cycle baselines (LCBs) associated with the preferred alternative are a part of environmental liabilities, site LCBs, and changes thereto. LCBs shall use Government Accountability Office (GAO) cost estimating best practices, and be reliable and integrated with the site and the entire EM program. Likewise, they shall be periodically assessed and measured, at all levels, along with project, site, and portfolio integrated master schedules (IMSs). As a key driver of LCBs, risks shall also be reviewed throughout the life of the demolition project as part of EM's risk management program.

The risk management program includes appropriate programmatic and project risk registers, mitigation strategies, and resulting programmatic/project contingency.

Demolition projects will obtain a concurrent CD-2/3 approval. Regulatory processes may provide equivalency for the establishment of KPPs. KPPs will align with end-state requirements when possible. Projects with a TPC greater than the minor construction threshold or \$50 million, whichever is higher, will begin Project Assessment and Reporting System (PARS) reporting at CD-2/3 approval. Project costs will be collected from CD-2/3 to CD-4 for all demolition projects.² Only the costs from CD-2/3 through CD-4 will be considered in establishing the TPC when the project is baselined. However, all costs from CD-0/1 shall be captured and reported as part of program costs in an effort to inform the overarching site and EM Program planning and budgeting effort.

In instances when a regulatory compliance framework is not applicable to drive the cleanup, the CD-0 mission need requirement is satisfied by the connection between the proposed project, site integrated life-cycle plan and the EM strategic goals, the EM mission statement, and/or specific applicable legislation. The CD-1 requirements and LCB information in this case will be tailored to accommodate the specific project need consistent with project management best practices.

6. CRITICAL DECISION APPROVAL AUTHORITY AND THRESHOLDS.

Approval authority for CD packages resides with the Project Management Executive (PME) consistent with TPC thresholds and delegated authorities.

- The cognizant Under Secretary³ serves as the PME for demolition projects with a TPC greater than \$1 billion.
- The Assistant Secretary for Environmental Management (EM-1) serves as the PME for demolition projects less than \$1 billion and promulgates program-wide policy and direction.
- EM-1 will normally delegate PME authority for demolition projects with a TPC of less than \$300 million to EM Site/Field Office managers.⁴
- EM Site/Field Office managers may further delegate PME authority only with EM-1 approval.

Under special circumstances, the cognizant Under Secretary and/or EM-1 may choose to delegate authority for any demolition projects with TPCs greater than the amounts stated above but falling within their respective authority limits.

² See Section VIII for exceptions related to projects with approved long-lead procurements.

³ In the absence of an assigned cognizant Under Secretary or delegation of Under Secretary functions to EM-1, the cognizant Under Secretary functions in this appendix will be fulfilled by the Deputy Secretary.

⁴ The EM Site/Field Office Manager shall be the Director of the EM Consolidated Business Center (EMCBC) for the EMCBC-serviced sites.

This protocol applies to demolition projects with a TPC greater than the minor construction threshold or \$50 million, whichever is higher, although the use of these requirements and project management best practices is encouraged for demolition projects with a TPC less than \$50 million.

7. REQUIREMENTS FOR APPROVAL OF CRITICAL DECISIONS.

a. CD-0/1, Document Mission Need/Alternative Selection and Cost Range.

The requirements of CD-0 for demolition projects are inherently satisfied by the EM mission statement, specific applicable legislation, and the applicable regulatory framework driving the cleanup or the connection between the project, the site life-cycle baseline, and EM strategic goals. For demolition projects operating under a regulatory framework, the CD-1 requirements are typically satisfied by equivalent processes established under regulatory and legal frameworks such as the *National Environmental Policy Act* (NEPA), *Resource Conservation and Recovery Act* (RCRA), National Priority List, and the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) as these regulatory processes progress. Demolition projects also may operate as part of the facility disposition process per DOE G 430.1-2 (current version). Typical equivalencies are shown in Table 1. In these cases, CD-0/1 documentation shall consist of a memorandum submitted to the PME for record-keeping purposes that documents the scope of the demolition project, cites the drivers for the demolition, and describes the applicable regulatory framework under which it will progress with any special circumstances. This memorandum may be submitted in combination with a CD-2/3 approval package. If it is determined that a regulatory framework applicable to the demolition project will not lead to development of the usual equivalent documentation and analysis such as those noted in Table 1, the PME reserves the right to request stand-alone documents to address the gap, consistent with documentation required under this Order and EM administrative requirements.

Table 1: Demolition Project Phases, Requirements Areas, and Potentially Equivalent Documentation

Baseline Management	Project Management		Environmental Management Cleanup		
			CERCLA	RCRA	Facility Disposition ¹
Planning Phase	Initiation Phase CD-0 Document Mission Need	- Identify program performance gap - Identify Need in Terms of the Mission, Purpose, Capability, Schedule and Cost Goals, and Operating Constraints	- Preliminary Assessment (PA)/ Site inspection (SI) - Removal site evaluation (includes removal PA and, if warranted, removal SI) and Approval Memorandum - Federal Facility Agreement/ Interagency Agreement	- RCRA Facility Assessment Report (RFA) - RCRA Permit/Consent Order	Facility Assessment (Site-Wide Infrastructure Long-Range Plan)
		Establish Integrated Project Team	Establish Project and Core Team	Establish Project and Core Team	
	Definition Phase CD-1 Approve Alternative Selection and Cost Range	<u>Pre-conceptual Design and Conceptual Design includes:</u> - Project Risk Management Plan - Alternative Analysis - Environmental Compliance - Waste Management - Quality Assurance - Value Engineering (VE) - Safeguards and Security Plans <u>Preliminary Baseline Range includes:</u> - Project Requirements - Alternatives Analysis Process - Technical Scope - High-Level/Summary Schedule - Cost Estimate Range	<u>Remedial Investigation/Feasibility Study (RI/FS) includes:</u> - Scoping the RI/FS - RI Site Characterization - RI: Baseline Risk Assessment (supplement with a project risk management plan) - RI Report - FS: Development and screening of alternatives - FS: Detailed analysis of the alternatives - FS: Treatability Studies - FS: Development of preliminary cost ranges and implementation timeframes - FS Report	<u>RCRA Facility Investigation (RFI) includes:</u> - Scoping the RFI - RFI: Work Plan - RFI: Site Characterization - RFI Report (supplement with a project risk assessment plan) <u>Corrective Measures Study (CMS) includes:</u> - Scoping the CMS and potential costs of alternatives - CMS: Work Plan - CMS Report	<u>Facilities Characterization Phase includes:</u> - Develop Mission Alternatives - NEPA (CX, EA, EIS) - Sampling and Analysis Plan - Characterization Work Plan - Characterization Report - Develop Risk Assessments and Impacts (supplement with a project risk assessment plan) - Develop Preferred Alternative - Prepare Fiscal Year Execution Plan and baselines
			<u>Remedy Selection includes:</u> - Identifying the preferred alternative - Record of Decision - Corrective Action Plan - VE - Quality Assurance (QA) Project Plan <u>Engineering Evaluation/Cost Analysis (EE/CA) includes:</u> - Scoping EE/CA - Site Characterization - Streamlined Risk Evaluation (SRE) (supplement with a project risk management plan) - Development and screening of alternatives - Analysis of the alternatives - Development of preliminary cost ranges and implementation timeframes - Removal Action Recommendation - EE/CA Report - Action Memorandum - Administrative Order on Consent (AOC)	<u>NEPA (in parallel with CMS): Categorical Exclusion (CX), Environmental Assessment (EA), Environmental Impact Statement (EIS), Supplement Analysis (SA)</u>	
		Acquisition Strategy	Acquisition Strategy	Acquisition Strategy	Acquisition Strategy
		Preliminary Project Execution Plan (PPEP)	Proposed Plan and Draft Record of Decision Public participation	NEPA Public Participation Proposed RCRA Permitting Actions with public participation	Define Decommissioning Work Plan
		Identify Project Endpoint	Define risk-based end state that is consistent with intended future use	Define risk-based end state that is consistent with intended future use	Define risk-based end state that is consistent with intended future use

Baseline Management	Project Management		Environmental Management Cleanup		
			CERCLA	RCRA	Facility Disposition ¹
Performance Phase (Performance Baseline)	Execution Phase CD-2 Approve Acquisition Performance Baseline	Performance Baseline is the original baseline for the project that defines: - Performance parameters - Technical scope - Schedule - Cost Reviews May Include: - External Independent Review (EIR) - Independent Project Review (IPR)	Final ROD or Action Memorandum Remedial Design/Remedial Action Work Plan (RD/RAWP)² includes: - Cost and Schedule refined - Waste Management - Contractor/Subcontractor strategies - Independent Field Office and HQ Assessments - Land Use Control Implementation Plan	Final RCRA Permit Modification and NEPA ROD Corrective Measure Implementation Plan (CMIP) includes: - Cost and Schedule refined - Environmental Compliance - Waste Management - Public Participation - Independent Field Office and HQ Assessment	Final Decommissioning Work Plan includes: - Environmental Compliance - Cost and Schedule - Waste Management - Environment, Safety and Health - Safety Analysis Report - Quality Assurance - Safeguards and Security - Public Participation - Independent Field Office and HQ Assessments
		Final Project Execution Plan (PEP)	Final RD/RAWP	Final CMIP	
	Execution Phase CD-2 Approve Performance Baseline	Performance Baseline is the original baseline for the project that defines: - Performance parameters - Technical scope - Schedule - Cost Reviews May Include: EIR IPR	Final ROD RD/RAWP includes: - Cost and Schedule finalized - Waste Management - Contractor/Subcontractor strategies - Independent Field Office and HQ Assessments - Land Use Control Implementation Plan	Final RCRA Permit Modification Corrective Measure Implementation Plan includes: - Cost and Schedule further refined - Environmental Compliance - Waste Management - Public Participation - Independent Field Office and HQ Assessment	Final Decommissioning Work Plan includes: - Environmental Compliance - Cost and Schedule finalized - Waste Management - Environment, Safety and Health - Safety Analysis Report - Quality Assurance - Safeguards and Security - Public Participation - Independent Field Office and HQ Assessments
		Final PEP	Final RD/RAWP	Final CMIP	
	Execution Phase CD-3 Approve Start of Demolition Activity	Construction	- Execute RD/RAWP - Independent cleanup verification per Work Plan/ROD	- Execute CMIP - Independent cleanup verification per RCRA Permit/CMIP	- Execute Deactivation and Decommissioning (D&D) Work Plan - Independent cleanup verification per Work Plan
	Transition/Closeout Phase CD-4 Approve Project Completion	- Final Financial Closeout - Site/Facility/System/Transition - Transition/Acceptance - Criteria - Transition to Long-Term Remedial Action	- Field Demobilization - Final RA report or equivalent - Notice of Deletion from NPL, if required - Operation and Maintenance plan - Five-Year Reviews of Remedy Effectiveness	- Field Demobilization - Corrective Measures report - Operation and Maintenance plan - Post-Closure Inspection and Maintenance plan - Periodic Corrective Action reports - RCRA permit renewals	- Demobilization - D&D Final report - Post-Closure Monitoring if necessary
	Post Completion Phase (No CD) Transition and Start of Long-Term Stewardship	- CD-4 accomplishes transition of completed short-term cleanup to long-term response action, institutional controls and other needed caretaker actions. - Site/project transferred from EM to the Lead Program Secretarial Office (PSO) or other receiving entity.	- Post Construction Report - Site Completion Report		Execute the actions of the disposition baseline (DOE O 430.1C and associated guides)
		Project/Site Transfer Plan	Site Completion Report	Closure Report	Field Decommissioning Report

¹ Source: Implementation Guide for Surveillance and Maintenance During Facility Transition and Disposition, (DOE G 430.1-2, current version); Deactivation Implementation Guide, (DOE G 430.1-3, current version); Decommissioning Implementation Guide, (DOE G 430.1-4, current version); and Transition Implementation Guide (DOE G 430.1-5, current version). All steps within this approach may be supplemented by regulatory processes and documentation produced under CERCLA or RCRA, if applicable.

² Some sites refer to this document as the remedial design/remedial action implementation plan (RD/RAIP). Others use both RD/RAWPs and RD/RAIPs constructing the documents in a tiered fashion. It should be noted that

Baseline Management	Project Management	Environmental Management Cleanup		
		CERCLA	RCRA	Facility Disposition ¹
this is all part of the implementation phase.				

In instances when a regulatory framework is not applicable, the CD-0 requirements shall consist of a memorandum that documents the scope of the demolition project, cites the drivers for the demolition as they relate to the site life-cycle baseline and EM strategic goals, and describes any special circumstances. CD-1 requirements will include development of a preliminary project execution plan (PPEP), an analysis of alternatives (AoA), and a risk management plan, at a minimum. The AoA may be satisfied by appropriate NEPA analyses or other state and federal processes that require an appropriate evaluation of alternatives. The resulting evaluation will be summarized in the PPEP. The risk management plan should include identification of the time-phased contingency needed for the demolition project. The combined CD-0/1 package shall be submitted to the appropriate PME for review and approval, in accordance with Section VI.

In all cases, a Federal Project Director (FPD) should be appointed as soon as is practicable. Experience gained in management of demolition projects shall be creditable toward FPD certification requirements under the Project Management Career Development Program.

b. CD-2/3, Approve Performance Baseline/Start of Demolition Activity for EM Demolition Projects.

Regardless of the driver, demolition project execution begins at CD 2/3 approval. The project planning must be sufficiently mature at the time of CD-2/3 approval to provide reasonable assurance that the project will be executed within the approved performance baseline (PB) (refer to Appendix C, paragraph 4 of this Order). If applicable, a remedial design/remedial action work plan (RD/RAWP) or corrective measure implementation plan (CMIP) should be completed and results form the basis for the development of the scope, cost, and schedule. CERCLA processes incorporating NEPA values (Schiffer 1995) may be used to satisfy NEPA requirements. All other activities are subject to completion of stand-alone NEPA documentation in accordance with applicable regulations. If task order contracts are utilized, the performance measurement baseline with schedule and cost estimates are developed in association with each task order. They are then integrated for the contract on a rolling basis upon award of each task order. Site managers and directors, contracting officers, budget analysts, and FPDs shall evaluate each proposed cost and schedule baseline against the integrated baseline prior to task order award to ensure that annual budget profiles are not exceeded and that existing performance metrics will not be compromised

due to task order award. The schedule must be an IMS, consistent with GAO best practices, updated on a regular basis, and integrated with the site and complex-wide schedule in accordance with the EM Program Management Policy. When possible, EM uses firm-fixed price and cost-plus incentive fee task order contracting to enhance program and project management. Timeliness of the independent government cost estimate (IGCE) creation compared to the CD-2/3 decision date may permit the use of the task order IGCE with independent project review (IPR)-validated DOE contingency estimates as a substitute for a project independent cost review or independent cost estimate and provides a stronger alignment between program and project management and contract management. In such cases, the IGCE shall use GAO cost estimating best practices. The DOE risk estimate and other direct costs (ODCs) shall be developed by the FPD. The demolition project success (at completion of CD-4) will be measured against the PB plan (at CD-2/3), consistent with this Order's success metric standard.

The document signed by the PME approving CD-2/3 must clearly specify the project's approved PB. The PB includes:

- (1) The TPC [contract budget base (performance measurement baseline with MR and fee) plus DOE-owned contingency value at 80% confidence level (or higher if required by the PME) and DOE ODCs], as driven by the required funding profile;
- (2) CD-4 date (month and year) at 80% confidence level (or higher if required by the PME);
- (3) Scope; and,
- (4) KPPs, if applicable, that must be achieved at CD-4.

KPPs will be clearly defined in the scope, contract inspection section, acceptance sections, and any applicable milestone description sheets that may be negotiated and appended to the contract. Acceptance of these contract deliverables by the contracting officer with input and verification from the FPDs shall constitute documentation of successful achievement of KPPs for CD-4. Contracting officers and FPDs shall ensure that contract deliverables include all necessary documentation to support the completion and payment claim.

For projects completed under regulatory frameworks, KPPs are defined in regulatory agreements such that regulatory approval of project completion documentation may serve as documentation of successful achievement of KPPs for CD-4. Documenting KPPs for demolition projects should adhere to DOE Guide (G) 413.3-5, current version, 6.0 Establishing Key Performance Parameters (KPPs). In general:

- KPPs must be specific scope statements that are discrete, achievable, and support regulatory key decisions;
- KPPs must not be so specific or broad that they are overly complex;

- KPPs must be reasonable, measurable, and provide reasonable assurance that key project objectives are met within cost and schedule milestones; and
- KPPs must meet objective criteria.

Work execution will be accomplished in accordance with applicable state and federal regulations, including the requirements in 10 Code of Federal Regulations (CFR) § 851, Worker Safety and Health Program; applicable DOE Orders; and established work control practices to ensure safety and health, quality, environmental protection, and work planning requirements are met.

Table 2 lists the minimum additional requirements needed to attain CD-0/1 for demolition projects that will not operate under a regulatory framework that provides full equivalency to the elements shown in Table 1. Table 3 lists the requirements needed to attain CD-2/3, while Table 4 shows requirements after CD-2/3 is obtained. Table 5 shows requirements associated with CD-4.

Table 2: Requirements Prior to CD-0/1 for Demolition Projects for which Regulatory Framework is Not Applicable or Not Fully Equivalent

Prior to CD-0/1	Approval Authority
Submit a memorandum to the PME that documents the scope of the demolition project, cites the drivers for the demolition as they relate to the site life-cycle baseline and EM strategic goals, and describes any special circumstances.	PME
Approve PPEP for demolition project not operating under regulatory framework process to provide equivalency. (Refer to DOE G 413.3-15, current version.) • Prepare a <u>funding profile</u> to support the execution of the PB, inclusive of funded contingency, and reflected in the budget document. The funding profile should be included in the PPEP. • Prepare and justify long-lead item procurements, if applicable.	PME
Develop risk management plan if not satisfied through regulatory framework process.	Field Organization
If not utilizing a CERCLA process, issue the draft NEPA analysis as required by 10 CFR § 1021 (e.g., Environmental Impact Statement [EIS], Programmatic EIS, Supplemental EIS, Supplement Analysis, or Environmental Assessment). (Refer to DOE Policy [P] 451.1, current version, and EM-specific policies and procedures.)	Delegated Authority

Table 3: Requirements for All Demolition Projects Prior to CD-2/3

Prior to CD-2/3	Approval Authority
Develop AS.	PSO ¹
Establish a PB, reflective of identified and assessed risks and uncertainties, to include TPC, CD-4 date, and if applicable, minimum KPPs. The key project milestones and completion dates shall be stated no less specific than month and year. The scope will be stated in quantity, size and other parameters, as appropriate, that give shape and form to the project. The funding assumptions upon which the PB is predicated will be clearly documented and approved. (Refer to DOE G 413.3-5, current version.)	FPD

Prior to CD-2/3	Approval Authority
Approve a PEP. For activities not operating under regulatory framework process to provide equivalency, a full PEP shall be prepared. Activities operating under a regulatory framework shall prepare a limited scope PEP for any necessary content elements not fully satisfied by the regulatory process (Refer to DOE G 413.3-15, current version.) Approve a funding profile to support the execution of the PB, inclusive of funded contingency, and reflected in the budget document. The funding profile should be included in the PEP and should be quantified and time-phased at the agreed-upon confidence level (minimum 80%, or higher if required by the PME). Prepare and justify long-lead item procurements, if applicable.	PME
Develop a risk management plan if not satisfied through regulatory framework process.	Field Organization
Complete PDRI analysis for projects with TPC greater than \$300 million (refer to DOE G 413.3-12, current version, which allows for alternative program-specific PDRI tools such as the EM critical decision analysis tool).	FPD
Project Management Support Office (PMSO) will conduct an Independent Project Review (IPR) to validate the PB for demolition projects with a TPC greater than \$300 million (Refer to DOE G 413.3-9, current version) unless justification is provided and a waiver is granted by the PME. The PMSO will invite a PM representative to be part of the IPR team and must issue a performance baseline validation letter to the PME that describes the cost, schedule, and scope being validated. (Refer to DOE G 413.3-9, current version). For projects greater than the minor construction threshold or \$50 million, whichever is higher, and less than \$300 million, prior to CD-2, an independent project review shall be performed by PMSO or another organization independent of the project.	PMSO or other independent organization (based on TPC value)
Employ an Earned Value Management System (EVMS) compliant with Electronic Industries Alliance (EIA)-748, current version, or as required by the contract, for projects greater than the minor construction threshold or \$50 million, whichever is higher. (Refer to DOE G 413.3-10, current version.) If the contract does not require use of EVMS (e.g., a firm-fixed price contract), file an exemption memorandum in accordance with this Order.	Certified by: DOE Office of Project Management Oversight and Assessment (DOE PM) greater than or equal to \$100 million
Update and approve the documented safety analysis for nuclear facilities or hazard analysis report for facilities that are below the Hazard Category 3 nuclear facility threshold, as defined in 10 CFR § 830, Subpart B, based on new hazards and design information. Develop and approve the PDSA for nuclear facilities that involve a demolition activity that constitutes a major modification as defined in DOE-STD-1189-2016.	Field Organization and Delegated Authority
Review and update for demolition projects, as needed, the Quality Assurance Program and make any necessary updates. (Refer to 10 CFR § 830, Subpart A; DOE O 414.1, current version, and DOE G 413.3-2, current version; and applicable version of NQA-1.) If work is not being performed under an EM quality program, approval must be established using EM-QA-001 Rev. 2, or current revision.	Delegated Authority
Perform security risk assessments, as required. (Refer to DOE O 470.4, current version, and DOE G 413.3-3, current version.)	Officially Designated Federal Security Authority (ODFSA)

Prior to CD-2/3	Approval Authority
If not utilizing a CERCLA process, issue the final NEPA documentation as required by 10 CFR § 1021 (e.g., EIS, Programmatic EIS, Supplemental EIS, or Supplement Analysis and Record of Decision or Amended Record of Decision; or Environmental Assessment and Finding of No Significant Impact) (Refer to DOE P 451.1, current version and EM-specific policies and procedures.)	Delegated Authority
Prepare a project funding document, similar to a project data sheet, and in consultation with the Office of the Chief Financial Officer (CFO), for demolition projects that delineates the budget year funding request, prior year budget requests and appropriations, and future planned budget requests. This funding document will reflect the most recent PME approved and document funding profile. (Refer to DOE CFO budget call for project funding document template.)	PME ²
Appoint Federal Project Director appropriate to the proposed project TPC if not already completed.	PME
Complete all Integrated Safety Management and Work Planning and Control documentation.	Field Organization
Complete contractor management self-assessment and DOE readiness assessment or operational readiness review, as appropriate.	Field Organization
Complete site assessments and characterization with hazards identified and plans for remediation and restoration included in statement of work when applicable to demolition project scope.	Field Organization
¹ Approval of the AS may be delegated to the PME for activities with a TPC less than \$300 million. ² In such instances, PME endorsement is required to ensure that appropriate (baselined) funding targets are being met, consistent with the cost baseline.	

Table 4: Requirements for All Demolition Projects after CD-2/3 Approval

Post-CD-2/3	Approval Authority
Submit all CD documents, and if there are changes to the PB, submit baseline change proposal (BCP) documents to PMSO with a copy to DOE PM and within PARS, to ensure independent oversight.	FPD
Endorse any changes to the approved funding profile that negatively impact the project.	FPD and PME
Provide Congressional notification pursuant to 10 U.S.C. § 6284, as appropriate. ¹	PMSO
Within 90 days, submit lessons learned regarding up-front project planning and design not yet recognized into the DOE Lessons Learned System of record, as described in DOE O 210.2 (current version).	FPD
For demolition projects with a TPC greater than the minor construction threshold or \$50 million, whichever is higher, initiate monthly PARS reporting (including earned value data). ² FPD, Program Manager, and DOE PM will provide monthly assessments.	FPD
Commence quarterly project reviews with the PME or their designee.	—

Post-CD-2/3	Approval Authority
Conduct project peer review (PPR) annually for projects with TPC greater than \$300 million. A DOE PM representative shall participate on each PPR team as a means to ensure an independent perspective outside the PMSO is provided and documented in the PPR and/or stand-alone report. Individuals leading PPRs or other reviews intended to meet the PPR requirements in this Order, shall elicit lessons learned with potential Department-wide implications and submit them into the DOE Lessons Learned System of record, as described in DOE O 210.2, current version.	PMSO
Review and finalize the site restoration plan to meet regulatory and site requirements, ³ if applicable.	Field Organization
¹ (A) In general The Secretary shall establish a cost and schedule baseline under the project management protocols of the DOE for each defense environmental cleanup project that is (i) in excess of \$50 million; and (ii) carried out by the Department pursuant to such protocols. (B) Notification to congressional defense committees—not later than 30 days after establishing a cost and schedule baseline under subparagraph (A), the Secretary shall submit the cost and schedule baseline to the congressional defense committees. ² See Section 8 for exceptions related to projects with approved long-lead procurements. ³ Site restoration plans must include, at a minimum, engineering specifications for materials to be used, materials placement and compaction, vegetative cover (i.e., percent coverage to be established and allowable species), contour requirements, satisfaction of special permit conditions (e.g., wetlands and protected and endangered species), and native or cultural resources protection/restoration. Several of these elements may require additional documentation to fully satisfy regulatory requirements (i.e., protection of cultural resources under the <i>National Historic Preservation Act</i>), but the approaches and commitments should be summarized in the restoration plan.	

c. CD-4, Approve Project Completion.

CD-4 is the achievement of the project completion criteria defined in the PEP, contract documents, and regulatory framework documents. This achievement marks the completion of the execution phase.

The approval of CD-4 is predicated on completion of the demolition project. The PME approves CD-4 upon notification from the project team that all project completion criteria defined in the PEP, contract documents, and regulatory framework documents have been met. The document signed by the PME approving CD-4 must clearly specify the scope accomplished, the TPC, KPPs met, and the completion date (month and year) as it relates to the original CD-2/3 performance baseline and latest approved baseline change. The date the PME signs the document represents the CD-4 completion date. Table 5 lists the requirements needed to attain CD-4 and actions required after CD-4 approval. If a demolition project is terminated prior to completion (CD-4), the FPD shall coordinate with PMSO to document the project closeout in accordance with Section 7.d of this appendix.

Table 5: CD-4 Requirements¹ for All Demolition Projects

Prior to CD-4	Approval Authority ²
Verify that KPPs have been met and that mission requirements have been achieved. The FPD will verify and document the scope accomplished, TPC, KPPs met, and the completion date as it relates to the original CD-2/3 performance baseline and the latest approved baseline change. Regulatory approval of project completion documentation may serve as documentation of successful achievement of KPPs for CD-4.	FPD
Perform a verification activity to ensure that all contractual, regulatory and permit requirements have been met, completed, and documented, and that no further RCRA/CERCLA response is needed to protect human health and the environment.	Field Organization
Update and approve, or cancel if appropriate, the documented safety analysis for nuclear facilities or hazard analysis report for facilities that are below the Hazard Category 3 nuclear facility threshold as defined in 10 CFR § 830, Subpart B, based on new hazards and design information.	Field Organization and Delegated Authority
Issue Safety Evaluation Report, as necessary.	Field Organization and Delegated Authority
Approve final as-built engineering drawings, as necessary.	FPD and Field Organization
If applicable, complete and submit contractor evaluation documents to the PME, the appropriate PSO, and the Office of Acquisition Management in accordance with FAR 42.15.	Field Organization
Post-CD-4	Approval Authority
Submit all CD documents to PMSO with a copy to DOE PM for maintenance of independent project management success metrics.	Field Organization
Complete minor punch list items such as regulatory reports and minor field work.	Field Organization verifies completion
Finalize PARS reporting (including earned value data).	—
Within 90 days, submit lessons learned regarding project execution not yet recognized into the DOE Lessons Learned System of record, as described in DOE O 210.2, current version.	FPD
Within 90 days, submit an initial project closeout report to the PMSO unless otherwise specified by the PME.	Field Organization
¹ Documents and reports are not intended to be stand alone and may be combined. ² Where no approval authorities are noted, authorities are established through other directives or the Program Offices (e.g., Functions and Requirements Assignment Matrix).	

d. Project Closeout.

After the project is complete, the next step is project closeout. Project closeout provides a determination of the overall closure status of the project, contracts, regulatory drivers, and fiscal condition. After CD-4 approval, the project shall complete the activities listed in Table 6 for the project to be considered “closed.”

Table 6: Project Closeout Requirements¹ for All Demolition Projects

Prior to Project Closeout		Approval Authority²
Perform final administrative and financial closeout. Prepare the final project closeout report once all project costs are incurred and invoiced and all contracts are closed. The report includes final cost details as required to include claims and claims settlement strategy where appropriate. (Refer to DOE G 413.3-16, current version.)		Field Organization
Establish and/or update the property record in the Facilities Information Management System (FIMS) for all modifications to real property. Update the real property planning and budgeting documentation as required. (Refer to DOE O 430.1C, current version.)		—
1 Documents and reports are not intended to stand alone and may be combined.		
2 Where no approval authorities are noted, authorities are established through other directives or the Program Offices (e.g., Functions and Requirements Assignment Matrix).		

8. PROJECTS REQUIRING LONG-LEAD PROCUREMENTS.

It may be necessary to obtain CD-3 approval early, namely CD-3A, for long-lead item procurement. When exercising long-lead procurement, the FPD must consider project plan maturity and the associated project risk. When applicable, a net present value justification for early approval of CD-3A (long-lead procurement) scope should be included with the CD-3A proposal data. If the long-lead item is nuclear safety-related or nuclear safety-related equipment, nuclear safety document maturity must be considered. This is the only instance when a CD action may be taken out of sequence (i.e., CD-3A in advance of CD-2/3). Activities such as incidental site preparation work; site characterization; limited access; and safety and security issues (e.g., fences) are often necessary prior to CD- 2/3. Approval of the CD-3A package for long-lead items technically represents the start of the demolition project execution. However, the remaining demolition project scope must still be approved in a CD-2/3 package at a later date. The approval authority for CD-3A packages shall reside with the PME applicable to the associated TPC value as stipulated in this protocol. The TPC value, not the CD-3A value, is the basis for determining the applicable PME. Projects with an approved CD-3A will begin reporting in PARS after CD-3A approval.

9. BASELINE MANAGEMENT.

a. Performance Baseline Deviation.

A performance baseline deviation occurs when the approved TPC, CD-4 completion date, or performance and scope parameters cannot be met. This includes any disaggregation of demolition project scope in an effort to establish a smaller project in the immediate term or at a later date. The FPD must promptly notify management whenever project performance indicates the likelihood of a PB deviation. When a deviation occurs, the approving authority must make a specific determination whether to terminate the project or establish a new PB by requesting the FPD to submit a baseline change proposal (BCP). A formal corrective action plan shall be developed by the Program Office to address root causes resulting in a project performance baseline deviation. The corrective action plan shall be submitted to the PME for approval, and along with the root cause analysis, inform the PME's decision during the BCP approval process.

New PB values established due to a deviation must be validated by the PMSO and approved by the PME. During the performance baseline change process, PM shall assess and validate, as a member of the PMSO IPR, the extent and effectiveness to which corrective actions have been taken to address and resolve the identified root causes.

Following approval of a project performance BCP, PM, as a review team participant or observer on project peer reviews when necessary and as appropriate, shall independently assess the effectiveness of approved corrective actions taken to address and resolve the identified root causes. The PMSO shall do likewise when PM is otherwise not available as a participant or observer.

In circumstances where a PB deviation is beneficial to the project—such as a lower TPC, earlier completion date, or significant scope enhancements—a validation of the PB deviation or approval by the PME is not required.

b. Performance Baseline Changes.

A performance baseline change represents an irregular event which should be avoided to the maximum extent. The PME is the final approval authority for PB changes for which the resulting TPC falls within their delegated authority, subject to the limitations listed in Section 4. This approval authority may not be delegated for changes that increase the TPC or schedule. If the resulting TPC exceeds the PME's authority, approval reverts to the next higher approval authority. New PB or PMB approval thresholds and authorities should be documented in the PEP for project changes below the thresholds identified. These approval levels must be incorporated into the change control process for each project. Table 7 identifies when a deviation must be approved by the cognizant Under Secretary. The approval by the PME or cognizant Under Secretary does not constitute approval of individual contract changes and modifications. If a contract change is necessary, the contracting officer has

exclusive authority to issue changes and modify contracts, but only if the changes or modifications comply with regulatory and statutory requirements. It is critical that the FPD and the contracting officer ensure that changes to the contract are identified, issued, administered, and managed in a timely manner over the life of the project and contract. The PB change process should not be used to circumvent proper change control management and contract management. The project shall utilize the baseline validation process established in Table 7. Confidence levels used in estimating costs associated with these changes should be at or above the agreed-upon percentiles originally used to establish the PB. The document signed by the PME or cognizant Under Secretary approving the BCP must clearly specify the project's revised PB, which includes the TPC, CD-4 date (month and year), scope and minimum KPPs that must be achieved at CD-4.

Table 7: Performance Baseline Change Authority

Type of Performance Baseline Change	Changes Requiring Cognizant Under Secretary Approval
Technical	Any change in scope and/or performance that affects the ability to satisfy the mission need or is not in conformance with the current approved PEP.
Cost	Increase in excess of the lesser of \$250 million or 50% (cumulative) of the original CD-2 cost baseline.

Pursuant to 10 U.S.C. § 6284, appropriate Congressional notification shall be made for baseline changes exceeding the amount that is equal to 125% of the established baseline and for any subsequent changes.

In addition, the cognizant Under Secretary must endorse any reduction in funding that adversely affects the project's approved funding profile. DOE PM shall be notified of these funding decrements. The cognizant Under Secretary, PMSO, and DOE PM shall be notified of all:

- (1) Schedule delays that breach the original PB by greater than 12 months;
- (2) Post-CD-2 projects that are terminated; or
- (3) Demolition projects no longer able to meet the Department's objective (see Appendix A, paragraph 1 of this Order).

A root cause analysis and corrective action plan should be completed when a PB change occurs, consistent with the Order thresholds in Appendix D, section IX.B. This applies to a demolition project, and to significant changes at the programmatic level. For changes requiring Congressional notification, this analysis must be provided consistent with 10 U.S.C. § 6284.

Decrements to approved PB funding profiles must be endorsed by the PME. In circumstances where a PB change is beneficial to the project, PB changes can be approved at lower levels as designated in the PEP.

c. Directed Changes.

Directed changes are caused by DOE policy directives (such as those that have the force and effect of law and regulation), regulatory or statutory actions and are initiated by entities external to the Department, to include external funding reductions. Directed change decisions are reviewed and verified by DOE PM and the Office of Management and Budget and follow the appropriate baseline management process as denoted in Section VII.B, above, with the exception of the root cause analysis.

d. Change Control.

Change control, as defined in the PEP, ensures that project changes are identified, evaluated, coordinated, controlled, reviewed, approved/disapproved, and documented in a manner that best serves the project. One key goal of change control is to ensure that PB thresholds are not exceeded. Approval authority for changes depends upon the estimated impact(s) of the change and can range from the contractor to the cognizant Under Secretary, usually with the involvement and support of a Change Control Board (CCB). CCB membership, authorities, thresholds, and procedures should be detailed or referenced within the PEP.

e. Contract Modifications for New Performance Baseline, if Applicable.

Prior to approval of a baseline change by the PME, the FPD shall coordinate with the contracting officer to identify the specific contract changes that may be required, develop an IGCE (refer to FAR 36.203 and FAR 15.406-1), establish a schedule for receipt of a contractor's proposals, obtain audit support, and ensure the timely analysis, negotiation, and execution of contract modifications that comply with regulatory and statutory requirements.

f. Cancellation of Projects.

If a demolition project is to be cancelled at any point after CD-0, the respective PME shall approve a cancellation decision and PARS will be updated, as necessary, to reflect the cancellation of the project. For all post-CD-2 cancellations, a formal written notification shall be issued to the cognizant Under Secretary and the Office of the Chief Financial Officer via PMSO. The formal written notification shall outline the reasons for the cancellation, how the mission need will be impacted, and a disclosure of all funds expended prior to the cancellation and the costs associated with the cancellation.

10. REFERENCES

DOE G 430.1-2, current version. *Implementation Guide for Surveillance and Maintenance During Facility Transition and Disposition.*

DOE G 430.1-3, current version. *Deactivation Implementation Guide.*

DOE G 430.1-4, current version. *Decommissioning Implementation Guide.*

DOE G 430.1-5, current version. *Transition Implementation Guide*.

PMI. (2017). A Guide to the Project Management Body of Knowledge (PMBOK® Guide)- Sixth Edition. Newtown Square, PA: PMI.

Schiffer, L. J. (1995, January 23). Memorandum to S. Herman, R. Nordhaus, K. McGinty, S Wasserman Goodman, et al. Agreed to Report of March 31, 1994 Meeting Regarding the Application of NEPA to CERCLA Cleanups. 1995: U.S. Department of Justice.

ATTACHMENT 1
CONTRACTOR REQUIREMENTS DOCUMENT
DOE O 413.3C, PROGRAM AND PROJECT MANAGEMENT FOR THE ACQUISITION
OF CAPITAL ASSETS

This Contractor Requirements Document (CRD) sets forth requirements applicable to the contract to which this CRD is inserted. The contractor is responsible for performing program and project management of Department-owned or -leased facilities as determined by the Federal Project Director (FPD) and contracting officer, in conjunction with the federally assigned Integrated Project Team members. The contractor shall: (1) comply with the requirements of this CRD to include subcontractors, and (2) flow down the appropriate requirements of the CRD to a subcontractor, when the total project costs to the prime contractor are greater than the minor construction threshold or \$50 million (whichever is higher).

The contractor's project management system shall satisfy the following requirements:

1. The contractor shall coordinate with the FPD to identify and define risk-informed tailoring opportunities for capital assets project for approval by the Project Management Executive (PME).
2. The contractor shall identify conflicts between this CRD and the existing Management and Operating contract requirements, if applicable, and coordinate them with the Field/Site Office contracting officer.
3. The contractor may be granted delegations, equivalencies, exemptions and/or variances by the DOE or NNSA Field/Site Office with concurrence from the applicable DOE or NNSA Program Offices.
4. Except for firm-fixed-price contracts, the contractor shall:
 - Employ an Earned Value Management System (EVMS) prior to Critical Decision (CD)-2, or upon contract award, for projects greater than the minor construction threshold or \$50 million (whichever is higher), unless granted an exemption from the Project Management Support Office (PMSO). The system shall be compliant with EIA-748, current version, or as required by the contract, in accordance with contract clause Federal Acquisition Regulations (FAR) Subpart 52.234-4, EVMS.
 - Maintain an EVMS compliant with EIA-748, current version, or as required by the contract when there are applicable projects with a TPC between the minor construction threshold or \$50 million (whichever is higher) and \$300 million.
 - For contractors with projects that have a TPC greater than \$300 million, the contractor will self-certify EVMS compliance with EIA-748, current version, through initial certifications and/or annual surveillances, or as required by the contract, and provide the final summary report documenting the results to the PMSO and Field/Site Office.

- Receive continued surveillance of EVMS compliance with EIA-748, current version, or as required by the contract, when there are applicable projects having a TPC of \$300 million or greater. PM may conduct a risk-based, data-driven surveillance as requested by the FPD, the Program, or the PME. Documentation of the surveillance will be provided to the contracting officer documenting the compliance status of the contractor's EVMS with EIA-748 (current version), or as required by the contract.
 - Provide access to all pertinent records and data requested by the contracting officer, PM, or other duly authorized representative as necessary to permit government surveillance to ensure EVMS complies, and continues to comply, with EIA-748, current version, as appropriate, or as required by the contract.
 - Submit a request for an over-target baseline or over-target schedule to the contracting officer when indicated by performance. The request shall include a top-level projection of cost (known as an estimate at completion) and/or schedule growth (known as an integrated master schedule), a determination of whether or not performance variances will be retained, and the schedule for the implementation of the rebaselining. Refer to DOE G 413.3-20, current version.
5. For projects with a TPC less than \$300 million, the contractor may request an exemption from using EVMS. For firm-fixed-price contracts, a contractor EVMS is not required. If contractor requests and an EVMS waiver is approved by the PMSO, the contractor will:
- Use an alternative project control method approved by the PMSO.
 - Describe the alternate project control system in detail to the contracting officer.
 - Ensure the system provides adequate insight to potential risks to DOE relating to achievement of cost, schedule, and technical performance objectives.
 - Ensure the alternate project control methods include at a minimum a work breakdown structure, integrated master schedule showing critical path, schedule of values, account of planned versus actual work and cost, and estimate at completion (EAC).
 - Beginning no later than 3 months following CD-2, the contractor will provide to the FPD project control information monthly for upload, including upload of the baseline and status schedules, and data from the schedule of values and planned versus actual work and cost accounts, into the Department's PARS system.

6. The contractor shall submit to the FPD monthly project performance data beginning no later than three months following CD-2 for projects having a total project cost greater than the minor construction threshold or \$50 million (whichever is higher).
 - a. For projects executed under a cost reimbursement contract and required to use an EVMS compliant with EIA-748, current version, or as specified in the contract, the required project performance data must be provided at the control account level. This includes:
 - Earned value data consistent with EIA-748, current version, or as required by the contract;
 - Time-phased incremental budget;
 - Management reserve;
 - Integrated master schedule (both baseline and status);
 - Variance analysis;
 - Risk management data; and
 - Formal submission of all DOE integrated program management report (IPMR) formats to the contracting officer and FPD for upload to PARS.
 - b. For a project or a portion of a project being accomplished under a cost reimbursement contract, where EVMS requirements have been waived and an alternate project control system adopted, project performance data will be provided monthly to the FPD and will include:
 - Baseline and status schedules;
 - Schedule of values data;
 - Planned versus actual work and control account data;
 - Variance analysis;
 - Risk management data; and
 - EAC data.

- c. Under a firm-fixed-price construction contract, EVM is not mandated by the government. However, it is not discouraged if used by a contractor to manage its projects as a standard business practice. Unlike a cost reimbursement contract, firm-fixed-price contracts are not subject to adjustment on the basis of the contractor's cost experience in performing the contract. Management of firm-fixed-price construction projects are accomplished through establishment of performance milestones, schedules, and percentage of project completion. For construction contracts, FAR Subpart 52.232-5, Payment[s] Under Fixed-Price Construction Contracts, governs payment and the data that the contractor must provide to support its estimate of work accomplished. Substantiation includes an itemization of the amounts requested, related to the various elements of work required by the contract covered by the payment requested and a listing of the amount included for work performed by each subcontractor under the contract, the total amount of each subcontract under the contract, and amounts previously paid to each subcontractor under the contract. While firm-fixed-price construction projects cannot require the regular submission of cost data as with a cost reimbursement contract, successful project and contract execution is highly dependent on well-defined requirements that serve as the foundation upon which performance milestones are developed, accomplished, and evaluated.
- d. Data shall be provided to the FPD no later than one week before the last workday of every month. These data shall be current as of the close of the previous month's accounting period. *Ad hoc* or periodic reporting by the contractor may be required earlier than CD-2 as specified in the contract.
- e. Any directed changes to the contractor requirements for monthly reporting must be added to the contract following an assessment of impacts to contractor conditions and to the project performance.
 - (1) For project contracts to be awarded as subcontracts by the contractor, the contractor shall develop a written acquisition plan, if applicable. The acquisition plan shall receive the contracting officer's concurrence.
 - (2) Technical performance analyses and corrective action plans shall be reported to DOE for variances to the project baseline objectives resulting from design reviews, component and system tests and simulations, and to resolve identified root causes resulting in a performance baseline deviation.
 - (a) An Integrated Master Schedule (both resource loaded and with critical path) must be developed and maintained for the project. As a minimum, a resource-loaded IMS must contain labor, material, and equipment costs to include unit prices and quantities. For firm-fixed-price contracts, the total contract cost must be included in the integrated master schedule.

- (b) Project technical, cost, and schedule risks must be identified, quantified, and mitigated throughout the life of the project. A risk management plan (RMP) will be developed to cover processes and procedures that will be implemented to address risk assessment (qualitative and quantitative), risk monitoring, risk reporting, and lessons learned. The contractor's RMP must receive concurrence from DOE in accordance with contract requirements.
- (c) The approved integrated contractor technical, cost, and schedule baseline shall be maintained using appropriate change control processes (e.g., Change Control Board) as defined in the project execution plan (PEP).
- (d) A configuration management process must be established that controls changes to the physical configuration of project facilities, structures, systems, and components in compliance with ANSI/EIA-649, current version, and DOE-STD-1073-2016. This process must also ensure that the configuration is in agreement with the performance objectives identified in the technical baseline and the approved quality assurance plan.
- (e) A value management (VM), value engineering (VE) process shall be used. Annually, contractors shall submit a progress report identifying VE accomplishments to the Program Offices. Refer to Office of Management and Budget (OMB) Circular A-131, 48 CFR § 52.248-1, ASTM E1699-10, and 41 U.S.C. § 1711.
- (f) A Quality Assurance Program must be developed and implemented for the contract scope of work in accordance with DOE O 414.1, current version, Attachment 2 (CRD), as applicable, and 10 CFR § 830, Subpart A. For nuclear-related activities, the applicable national consensus standard shall be American Society of Mechanical Engineers Nuclear Quality Assurance (NQA)-1-2008 (edition) and NQA-1a-2009 (addenda).
- (g) An Integrated Safety Management System must be developed and implemented for the contract scope of work when the contractor is complying with the requirements of 48 CFR § 970.5223-1, *Integration of Environment, Safety and Health into Work Planning and Execution*.
- (h) Contractors performing design for projects shall, at a minimum, conduct conceptual, preliminary and final design reviews, in accordance with the PEP. For nuclear projects, the design review will include a focus on safety and security systems. A code of record shall be maintained under configuration control throughout the CD process and for the remainder of the nuclear facility's life cycle.

- (i) For projects involving construction of new Hazard Category 1, 2, and 3 nuclear facilities, or include major modifications thereto (as defined in 10 CFR § 830), the requirements in DOE-STD-1189-2016 shall be fully implemented. The following documents must be submitted, as applicable: safety design strategy (CD-1), conceptual safety design report (CD-1), preliminary safety and design results (CD-2), preliminary documented safety analysis (CD-2), and documented safety analysis with technical safety requirements (CD-4). Documented safety analyses will be updated to document the changed conditions, as appropriate, in conjunction with the Office of Environmental Management demolition process.
- (j) For non-M&O contracts, the contractor shall develop a project management plan (PMP) that supports and complements the federal PEP and its contract. The PMP shall describe the management methods, organization, control systems and documentation for the project. The PMP shall receive the concurrences of the FPD and the DOE contracting officer. If significant changes occur during the project, the PMP shall be revised by the contractor at the direction of the contracting officer.
- (k) Contractors must identify, collect, capture, and enter lessons learned into the DOE Lessons Learned System of record, as described in DOE O 210.2, current version. All department employees and contractors may gain access to the lessons learned repository.

ATTACHMENT 2 DEFINITIONS

1. Acquisition Plan. The document that facilitates attainment of the acquisition objectives. The plan must identify those milestones at which decisions should be made; all the technical, business, management; and other significant considerations that will control the acquisition including, but not limited to, market research, competition, contract type, source selection procedures and socioeconomic considerations.
2. Acquisition Strategy. A high-level business and technical management approach designed to achieve project objectives within specified resource constraints with recognition of key project risks and the strategies identified to handle those risks. It is the framework for planning, organizing, staffing, controlling, and leading a project. It provides a master schedule for activities essential for project success, and for formulating functional strategies and plans.
3. Baseline. A quantitative definition of cost, schedule and technical performance that serves as a base or standard for measurement and control during the performance of an effort; the established plan against which the status of resources and the effort of the overall program, field programs, projects, tasks, or subtasks are measured, assessed and controlled. Once established, baselines are subject to change control discipline.
4. Baseline Change Proposal. A document that provides a complete description of a proposed change to an approved performance baseline, including the resulting impacts on the project scope, schedule, design, methods, and cost baselines.
5. Beneficial Occupancy. Stage of construction of a building or facility, before final completion, at which its user can occupy it for the purpose for which it was constructed. Beneficial occupancy does not imply that a project has reached Critical Decision (CD)-4.
6. Best Practices. An activity or procedure that has produced outstanding results in another situation and could be adapted to improve effectiveness and efficiency in a current situation.
7. Capital Assets. Capital assets are land, structures, equipment, and intellectual property, which are used by the federal government and have an estimated useful life of 2 years or more. Capital assets exclude items acquired for resale in the ordinary course of operations or held for the purpose of physical consumption such as operating materials and supplies. Capital assets may be acquired in different ways: through purchase, construction, or manufacture; through a lease-purchase or other capital lease, regardless of whether title has passed to the federal government; or through exchange. Capital assets include the environmental remediation of land to make it useful; leasehold improvements and land rights; assets owned by the federal government but located in a foreign country or held by others (such as federal contractors, state and local governments, or colleges and universities); and assets the ownership of which is shared by the federal government with other entities.

8. Capital Asset Project. A project with defined start and end points required in the acquisition of capital assets. The project acquisition cost of a capital asset includes both its purchase price and all other costs incurred to bring it to a form and location suitable for its intended use. It is independent of funding type. It excludes operating expense funded activities such as repair, maintenance, or alterations that are part of routine operations and maintenance functions.
9. CD-0, Approve Mission Need. Approval of CD-0 formally establishes a project and begins the process of conceptual planning and design used to develop alternative concepts and functional requirements. Additionally, CD-0 approval allows the Program to request project engineering and design (PED) funds for use in preliminary design, final design, and baseline development.
10. CD-1, Approve Alternative Selection and Cost Range. CD-1 approval marks the completion of the project definition phase and the conceptual design. Approval of CD-1 provides the authorization to begin the project execution phase and allows PED funds to be used.
11. CD-2, Approve Performance Baseline. CD-2 approval marks the approval of the performance baseline and requires the completion of preliminary design for all projects. It also requires the completion of final design for Hazard Category 1, 2, and 3 nuclear facilities. It is the first major milestone in the project execution phase. Approval of CD-2 authorizes submission of a budget request for the total project cost (TPC).
12. CD-3, Approve Start of Construction. CD-3 provides authorization to complete all procurement and construction and/or implementation activities and initiate all acceptance and turnover activities. Approval of CD-3 authorizes the project to commit all the resources necessary, within the funds provided, to execute the project.
13. CD-4, Approve Start of Operations or Project Completion. CD-4 approval marks the achievement of the completion criteria (i.e., key performance parameters [KPPs]) defined in the PEP (or in the program requirements document, for National Nuclear Security Administration [NNSA] projects), and if applicable, subsequent approval of transition to operations.
14. Change Control. A process that ensures changes to the approved baseline are properly identified, reviewed, approved, implemented, and tested and documented.
15. Code of Record. A set of design and operational requirements, including federal and state laws in effect at the time a facility or item of equipment was designed and accepted by the Department of Energy (DOE). It is (i) initiated during the conceptual design phase, placed under configuration control to ensure it is updated to include more detailed design requirements as they are developed during preliminary design, (ii) controlled during final design and construction with a process for reviewing and evaluating new and revised requirements to determine their impact on project safety, cost, and schedule before a decision is taken to revise the code of record, and (iii) maintained and controlled through facility decommissioning. The code of record may be defined in contracts, standards or requirements identification documents (or their equivalent), or project-specific documents [DOE-STD-1189-2016].

16. Conceptual Design. The conceptual design process requires a mission need as an input. It is the exploration of concepts, specifications, and designs for meeting the mission needs, and the development of alternatives that are technically viable, affordable, and sustainable. The conceptual design provides sufficient detail to produce a more refined cost estimate range and to evaluate the merits of the project.
17. Confidence Level. The likelihood—expressed as a percentage—that an occurrence will be realized. The higher the confidence level, the higher the probability of success.
18. Configuration Management. The technical and administrative direction and surveillance actions taken to identify and document the functional and physical characteristics of a configuration item, to control changes to a configuration item and its characteristics, and to record and report change processing and implementation status.
19. Constructability Review. A technical review to determine the extent to which the design of a structure facilitates ease of construction, subject to the overall requirements for the completed form.
20. Contingency. The portion of the project budget that is available for risk uncertainty within the project scope, but outside the scope of the contract. Contingency is budget that is not placed on the contract and is included in the TPC. Contingency is controlled by federal personnel as delineated in the PEP.
21. Contractor Requirements Document. The DOE document that identifies the requirements that the prime contractor's project management system must satisfy (Attachment 1).
22. Corporate Certification. A corporate certification exists when a contractor adopts one of their existing certified Earned Value Management System (EVMS) in its entirety for application under a new contract, regardless of location. The EVMS under the corporate certification must remain intact in all aspects to that originally certified and will be validated by an EVMS surveillance.
23. Critical Decision. A formal determination made by the Chief Executive (CE) or Project Management Executive (PME) at a specific point during the project that allows the project to proceed to the next phase or CD.
24. Critical Path. Those series of tasks that define the longest durations of the project. Each task on the critical path is a critical task and must finish on time for the entire project to finish on time.
25. Deactivation. The process of placing a facility in a stable and known condition, including the removal of hazardous and radioactive materials to ensure adequate protection of the worker, public health and safety, and the environment, thereby limiting the long-term cost of surveillance and maintenance. Actions include the removal of fuel, draining and/or de-energizing nonessential systems, removal of stored radioactive and hazardous materials, and related actions. Deactivation does not include all decontamination necessary for the dismantlement and demolition phase of decommissioning (i.e., removal of contamination remaining in the fixed structures and equipment after deactivation).

26. Decommissioning. Takes place after deactivation and includes surveillance and maintenance, decontamination, and/or dismantlement. These actions are taken at the end of the life of a facility to retire it from service with adequate regard for the health and safety of workers and the public and for the protection of the environment. The ultimate goal of decommissioning is unrestricted release or restricted use of the site.
27. Decontamination. The removal or reduction of residual chemical, biological, or radiological contaminants and hazardous materials by mechanical, chemical or other techniques to achieve a stated objective or end condition.
28. Demolition. Destruction and removal of physical facilities or systems.
29. Design Authority (for nuclear facilities only). The engineer designated by the PME to be responsible for establishing the design requirements and ensuring that design output documentation appropriately and accurately reflect the design basis. The Design Authority is responsible for design control and ultimate technical adequacy of the design process. These responsibilities are applicable whether the process is conducted fully in-house, partially contracted to outside organizations, or fully contracted to outside organizations. The Design Authority may delegate design work, but not its responsibilities.
30. Design-Bid-Build. A project delivery method wherein design and construction are separate contracts.
31. Design-Build. A project delivery method wherein design and construction contracts are combined. It is important that specific flow-down requirements be specified in requests for proposals to subcontractors, especially for firm-fixed-price subcontracts, to ensure implementation of the principles from this Order for effective performance measurement of the subcontractors' scope of work.
32. Design Review. A formal and documented management technique used primarily to conduct a thorough evaluation of a proposed design in order to determine whether or not the proposed design meets the project requirements set forth by the customer, as well as to determine whether the proposed design will be fully functional.
33. Deviation. Occurs when the TPC, CD-4 completion date, or performance and scope parameters, defined by the approved performance baseline (PB) at CD-2, cannot be met.
34. Directed Change. A change caused by some DOE policy directives (such as those that have force and effect of law and regulation), regulatory, or statutory action and is initiated by entities external to the Department, to include external funding reductions.
35. Dismantlement. The disassembly or demolition and removal of any structure, system or component during decommissioning and satisfactory interim or long-term disposal of the residue from all or portions of a facility.

36. Disposal. Final placement or destruction of toxic, radioactive, or other waste, surplus or banned pesticides or other chemicals, polluted soils, and drums containing hazardous materials from removal actions or accidental releases. Disposal may be accomplished through use of approved, secure, regulated landfills, surface impoundments, land farming, deep well injection, or incineration.
37. Disposition. Those activities that follow completion of program missions, including but not limited to preparation for reuse, surveillance, maintenance, deactivation, decommissioning, and long-term stewardship. DOE Order (O) 430.1, current version, provides implementation guidance for requirements specific to the disposition and long-term stewardship of contaminated, excess facilities.
38. Earned Value. The budgeted value of work actually accomplished in a given time. Simply defined, earned value represents the value of work accomplished during the period.
39. Earned Value Management. A project performance method that utilizes an integrated set of performance measurements (e.g., scope, cost, and schedule) to assess and measure project performance and progress, and estimate cost and schedule impacts at completion.
40. Earned Value Management System. An integrated set of policies, procedures and practices to objectively track true performance on a project or program. EVMS represents an integration methodology that is able to provide an early warning of performance problems while enhancing leadership decisions for successful corrective action.
41. Energy Savings Performance Contracts(ESPC). Allow federal agencies to procure energy savings and facility improvements with no up-front capital costs or special appropriations from Congress. An ESPC is a partnership between an agency and an energy service company. Each such contract may, notwithstanding any other provision of law, be for a period not to exceed 25 years.
42. Energy Systems Acquisition Advisory Board. Advises the CE on CDs related to major system projects, site selection, and PB deviation dispositions.
43. Environmental remedial action plan. Summarizes the remedial alternatives presented in the analysis of the feasibility study and identifies the preferred alternative and the rationale for selecting the preferred alternative.
44. Equivalencies. Alternatives to how a requirement in a directive is fulfilled in cases where the “how” is specified. These represent an acceptable alternative approach to achieving the goal of the directive. Unless specified otherwise in the directive, equivalencies are granted, in consultation with the Office of Primary Interest (OPI), by the Program Secretarial Officer or designee or, in the case of the NNSA, by the Administrator or designee, and documented for the OPI in a memorandum. For those directives listed in Attachment 1 of DOE O 410.1 (current version), Central Technical Authority (CTA) concurrences are required prior to the granting of equivalencies.
45. Estimate At Completion. Actual cost of work completed to date plus the predicted costs and schedule for finishing the remaining work.

46. Estimate-To-Complete. The value expressed in either dollars or hours developed to represent the cost of the work required to complete a task.
47. EVMS Certification. The determination that a contractor's EVMS, on all applicable projects, is in full compliance with EIA 748, current version, or as required by the contract, and in accordance with Federal Acquisition Regulations (FAR) Subpart 52.234-4, Earned Valued Management System.
48. EVMS Surveillance. The process of reviewing a contractor's certified EVMS, on all applicable projects, to establish continuing compliance with EIA 748, current version, or as required by the contract, and in accordance with FAR Subpart 52.234-4. Surveillance may also verify that EVMS use is properly implemented by the contractor.
49. Exemptions. The release from one or more requirements in a directive. Unless specified otherwise in the directive, exemptions are granted, in consultation with the OPI, by the Program Secretarial Officer or their designee, or in the case of the NNSA, by the Administrator or designee, and documented for the OPI in a memorandum. For those directives listed in Attachment 1 of DOE O 410.1, current version, CTA concurrences are required prior to the granting of exemptions.
50. External Independent Review. A project review performed by personnel from PM and augmented by individuals outside DOE, primarily to support validation of either the PB (CD-2) or construction/execution readiness (CD-3). PM selects an appropriate group of subject matter experts in a contracted capacity to assist with these reviews.
51. Facilities Information Management System. The Department's corporate database for real property. The system provides the Department with an accurate inventory and management tool that assists with planning and managing all real property assets. See DOE O 430.1, current version, for additional information.
52. Federal Program Manager. An individual in the Headquarters organizational element responsible for managing a program and, until designation of the FPD, its assigned projects. They ensure that all the projects are properly phased and funded over time and that each project manager is meeting the appropriate key milestones. They are the project manager's advocate, ensure proper resourcing and facilitate the execution process. They predict programmatic risks and put mitigation strategies in place so that projects are not affected.
53. Federal Project Director. The individual certified under the Department's Project Management Career Development Program as responsible and accountable to the PME or Program Secretarial Officer for project execution. Responsibilities include developing and maintaining the PEP; managing project resources; establishing and implementing management systems, including performance measurement systems; and approving and implementing changes to project baselines.
54. Field/Site Organization. The federal organization at the laboratory, site, or plant responsible for overseeing contractor operations and carrying out responsibilities in accordance with delegated authority.

55. Final Design. Completion of the design effort and production of all the approved design documentation necessary to permit procurement, construction, testing, checkout, and turnover to proceed.
56. Funding Profile. A representation of the project funding over the life of the project. It is part of the PME decision and any decremental change requires PME approval.
57. Hot Commissioning. The processing of a minimal acceptable sample of an actual material to obtain the desired performance output during the startup and testing phase of a chemical or nuclear processing facility.
58. Independent. An office or entity that is not under the supervision, direction, or control of the sponsor responsible for carrying out the project's development or acquisition.
59. Independent Cost Estimate. A cost estimate, prepared by an organization independent of the project sponsor, using the same detailed technical and procurement information to make the project estimate. It is used to validate the project estimate to determine whether it is accurate and reasonable.
60. Independent Cost Review. An independent evaluation of a project's cost estimate that examines its quality and accuracy, with emphasis on specific cost and technical risks. It involves the analysis of the existing estimate's approach and assumptions.
61. Independent Government Cost Estimate. The government's estimate of the resources and its projected costs that a contractor would incur in the performance of a contract. These costs include direct costs such as labor, supplies, equipment, or transportation and indirect costs such as labor and material overhead, as well as general and administrative expenses, profit, or fee. (Refer to FAR 36.203 and FAR 15.404-1.)
62. Independent Project Review. A project management tool that serves to verify the project's mission, organization, development, processes, technical requirements, baselines, progress, and/or readiness to proceed to the next successive phase in DOE's Acquisition Management System.
63. Integrated Project Team. A cross-functional group of individuals organized for the specific purpose of delivering a project to an external or internal customer. It is led by a Federal Project Director.
64. Integrated Safety Management System. The application of the Integrated Safety Management System to a project or activity. The fundamental premise of Integrated Safety Management is that accidents are preventable through early and close attention to safety, design, and operation, and with substantial stakeholder involvement in teams that plan and execute the project, based on appropriate standards.

65. Key Performance Parameters. A vital characteristic, function, requirement, or design basis that, if changed, would have a major impact on the facility or system performance, scope, schedule, cost, and/or risk or the ability of an interfacing project to meet its mission requirements. A parameter may be a performance, design, or interface requirement. Appropriate parameters are those that express performance in terms of accuracy, capacity, throughput, quantity, processing rate, purity, reliability, sustainability, or others that define how well a system, facility, or other project will perform. In aggregate, KPPs comprise the scope of the project.
66. Lessons Learned. A good work practice or innovative approach that is captured and shared to promote repeat application or an adverse work practice or experience that is captured and shared to prevent recurrence. They are the project management related input and output device that represents the knowledge, information or instructional knowledge that have been garnered through the process of actually completing the ultimate performance of the respective project. Lessons learned are valuable because they will benefit future endeavors and ideally prevent any negative happenings from taking place in the future.⁵
67. Life-Cycle Costs. The sum total of all direct, indirect, recurring, nonrecurring, and other related costs incurred or estimated to be incurred in the planning, design, development, procurement, production, operations and maintenance, support, recapitalization, and final disposition of real property over its anticipated lifespan for every aspect of the program, regardless of funding source.
68. Line Item. A distinct design, construction, betterment, and/or fabrication of real property for which Congress will be requested to authorize and appropriate specific funds. A full-scale test asset or other pilot/prototype asset primarily constructed for experimental or demonstration purposes, but planned to become DOE property and to continue to operate beyond the experimental or demonstration phase is included in this definition.
69. Long-Lead Procurement. Equipment, services, and/or materials that must be procured well in advance of the need because of long delivery times. If long-lead procurements are executed prior to CD-3 approval for the project, this will be designated as CD-3A and require a stand-alone decision by the PME, outside of the CD process.
70. Major Item of Equipment. Capital equipment with a cost that exceeds \$2 million. In most cases, capital equipment is installed with no construction cost. However, in cases where the equipment requires provision of supporting construction such as foundations, utilities, structural modifications, and/or additions to a building, the associated construction activities must be acquired through a line-item construction project or a minor construction project if the cost is below the minor construction threshold stated in 10 U.S.C. § 6271.

⁵ DOE O 210.2, *DOE Corporate Operating Experience Program* (current version), <https://www.directives.doe.gov/directives-documents/200-series/0210.2-BOrder-a>

71. Major System Project. A project with a TPC of greater than or equal to \$1 billion or as designated by the Deputy Secretary.
72. Management Reserve. An amount of the total contract budget withheld for management control purposes by the contractor. Management reserve is not part of the performance measurement baseline.
73. Milestone. Any significant or substantive point, time or event of the project. Milestones typically refer to points at which large schedule events or a series of events have been completed, and a new phase or phases are set to begin.
74. Mission Need Statement. The primary document supporting the PME's decision to initiate exploration of options to fulfill a capability gap including but not limited to acquisition of a new capital asset.
75. Minor Construction Project. Miscellaneous minor construction project, of a general nature, for which the total estimated cost may not exceed the minor construction threshold stated in 10 U.S.C. 6271. These projects, sometimes called general plant projects (GPPs), are necessary to adapt facilities to new or improved production techniques, to effect economies of operations, and to reduce or eliminate health, fire and security problems. These projects provide for design, construction, additions, and/or improvements to land, buildings; replacements or additions to roads; and general area improvements. (Refer to 10 U.S.C. § 6273.)
76. Mitigation. Technique to eliminate or lessen the likelihood and/or consequence of a risk.
77. Non-Major System. Any project with a TPC less than \$1 billion.
78. Operational Readiness Review (ORR). A disciplined, systematic, documented, performance-based examination of facilities, equipment, personnel, procedures and management control systems to ensure that a facility can be operated safely within its approved safety envelope as defined by the facility safety basis plan. The ORR provides the basis for the Department to direct startup or restart of the facility, activity or operation.
79. Other Project Costs (OPCs). All other costs related to a project that are not included in the total estimated cost (TEC). OPCs will include, but are not limited to research and development, conceptual design and conceptual design report, startup and commissioning costs, *National Environmental Policy Act* documentation, project data sheet preparation, siting, and permitting requirements.
80. Performance Baseline. The collective key performance, scope, cost, and schedule parameters, which are defined for all projects at CD-2. The PB includes the entire project budget (TPC including fee and contingency) and represents DOE's commitment to Congress.

81. Performance Measurement Baseline. The baseline cost that encompasses all contractor project work packages and planning packages, derived from summing all the costs from the work breakdown structure. Undistributed management reserve, contingency, profit, fee, and DOE direct costs are not part of the PMB. The PMB is the benchmark used within EVMSs to monitor project (and contract) execution performance.
82. Preliminary Design. This is the design that is prepared following CD-1 approval. Preliminary design initiates the process of converting concepts to a design appropriate for procurement or construction. All KPPs and project scope are sufficiently defined to prepare a budget estimate. This stage of the design is complete when it provides sufficient information to support development of the PB.
83. Program. An organized set of activities directed toward a common purpose or goal undertaken or proposed in support of an assigned mission area. It is characterized by a strategy for accomplishing a definite objective that identifies the means of accomplishment, particularly in qualitative terms, with respect to work force, material, and facility requirements. Programs are typically made up of technology-based activities, projects and supporting operations.
84. Program Management. A group of closely related projects managed in a coordinated way.
85. Project. A unique effort having defined start and end points undertaken to create a product, facility, or system. Built on interdependent activities planned to meet a common objective, a project focuses on attaining or completing a deliverable within a predetermined cost, schedule, and technical scope baseline. Projects include planning and execution of construction, assembly, renovation, modification, environmental restoration, decontamination and decommissioning, large capital equipment, and technology development activities. A project is not constrained to any specific element of the budget structure (e.g., operating expenses).
86. Project Assessment and Reporting System. A reporting process to connect field project status with Headquarters to report and compare budgeted or scheduled project forecasts.
87. Project Closeout. Occurs after CD-4, Project Completion, and involves activities such as performing financial and administrative closeout, developing project closeout and lessons learned reports, and other activities as appropriate for the project.
88. Project Data Sheet. A document that contains summary project data and the justification required to include the entire project effort as a part of the Departmental budget.
89. Project Definition Rating Index. This is a project management tool which is used for assessing how well the project scope is defined. The tool uses a numeric assessment which rates a wide range of project elements to determine how well the project is defined.
90. Project Engineering and Design. Design funds established for use on preliminary design. Typically, PED funds are used for preliminary and final design and related activities for design-bid-build strategies, and for preliminary design and related costs in design-build strategies. It is also analogous with a project phase that includes preliminary and final design and baseline development.

91. Project Execution Plan. DOE's core document for management of a project. It establishes the policies and procedures to be followed in order to manage and control project planning, initiation, definition, execution, and transition/closeout, and uses the outcomes and outputs from all project planning processes, integrating them into a formally approved document. A PEP includes an accurate reflection of how the project is to be accomplished, resource requirements, technical considerations, risk management, configuration management, and roles and responsibilities.
92. Project Management. Those services provided to DOE on a specific project, beginning at the start of design and continuing through the completion of construction, for planning, organizing, directing, controlling and reporting on the status of the project.
93. Project Management Plan. The contractor-prepared document that sets forth the plans, organization, and systems that the contractor will utilize to manage the project. Its content and the extent of detail of the PMP will vary in accordance with the size and type of project and state of project execution.
94. Project Management Support Office. An office established exclusively to oversee and manage the activities associated with projects.
95. Project Peer Reviews. Periodic review of a project performed by peers (with similar experience to project personnel), independent from the project, to evaluate technical, managerial, cost and scope, and other aspects of the project, as appropriate. These reviews are typically led by the PMSO.
96. Quality Assurance. All those actions performed by the DOE prime contractor during the project that provide confidence that quality is achieved. It is executed through a formalized Quality Assurance Program.
97. Quality Control. Those actions related to the physical characteristics of a material, structure, component, or system that provide a means to control the quality of the material, structure, component, or system to predetermined requirements.
98. Readiness Assessment. An assessment to determine a facility's readiness to startup or restart when an ORR is not required or when a contractor's standard procedures for startup are not judged by the contractor or DOE management to provide an adequate verification of readiness.
99. Resource-Loaded Schedule. Schedules with resources of staff, facilities, cost, equipment and materials that are needed to complete the activities required.
100. Risk. Factor, element, constraint, or course of action that introduces an uncertainty of outcome, either positively or negatively that could impact project objectives.
101. Risk Assessment. Identification and analysis of project and program risks to ensure an understanding of each risk in terms of probability and consequences.

102. Risk Management. The handling of risks through specific methods and techniques. Effective risk management is an essential element of every project. The DOE risk management concept is based on the principles that risk management must be analytical, forward-looking, structured, informative, and continuous. Risk assessments should be performed as early as possible in the project and should identify critical technical, performance, schedule, and cost risks. Once risks are identified, sound risk mitigation strategies and actions should be developed and documented.
103. Risk Management Plan. Documents how the risk processes will be carried out during the project.
104. Rough- Order of Magnitude (ROM) Estimate. An estimate based on high-level objectives, provides a high-level view of the project deliverables, and has lots of wiggle room. Most ROM estimates have a range of variance from -25% all the way to +75%.
105. Safeguards and Security. An integrated system of activities, systems, programs, facilities and policies for the protection of classified information and/or classified matter, unclassified control information, nuclear materials, nuclear weapons, nuclear weapon components, and/or the Department's and its contractors' facilities, property and equipment.
106. Tailoring. An element of the acquisition process appropriate considering the risk, complexity, visibility, cost, safety, security, and schedule of the project. Tailoring does not imply the omission of essential elements in the acquisition process or other processes that are appropriate to a specific project's requirements or conditions.
107. Technical Independent Project Review. An independent project review conducted at or near the completion of preliminary design, and is required prior to CD-2 approval for Hazard Category 1, 2, and 3 nuclear facilities. At a minimum, the focus of this review is to determine that the safety documentation is sufficiently conservative and bounding to be relied upon for the next phase of the project.
108. Technology Maturation Plan (TMP). A TMP details the steps necessary for developing technologies that are less mature than desired to the point where they are ready for project insertion.
109. Technology Readiness Assessment. An assessment of how far technology development has proceeded. It provides a snapshot in time of the maturity of technologies and their readiness for insertion into the project design and execution schedule.
110. Technology Readiness Level. A metric used for describing technology maturity. It is a measure used by many U.S. Government agencies to assess maturity of evolving technologies (materials, components, devices, etc.) prior to incorporating that technology into a system or subsystem.

111. Total Estimated Cost. All engineering design costs (after conceptual design), facility construction costs and other costs specifically related to those construction efforts. TEC will include, but is not limited to project, design, and construction management; contract modifications (to include equitable adjustments) resulting in changes to these costs; design; construction; contingency; contractor support directly related to design and construction; and equipment rental and refurbishment.
112. Total Project Cost. All costs between CD-0 and CD-4 specific to a project incurred through the startup of a facility, but prior to the operation of the facility. Thus, TPC includes TEC plus OPC.
113. Value Engineering. A structured technique commonly used in project management to optimize the overall value of the project. Often, creative strategies will be employed in an attempt to achieve the lowest life-cycle cost available for the project. The value engineering effort is a planned, detailed review/evaluation of a project to identify alternative approaches to providing the needed assets.
114. Value Management. An organized effort directed at analyzing the functions of systems, equipment, facilities, services, and supplies for achieving the essential functions at the lowest life-cycle cost that is consistent with required performance, quality, reliability, and safety. VM encompasses VE.
115. Variance. A measurable change from a known standard or baseline. It is the difference between what is expected and what is actually accomplished. A variance is a deviation or departure from the approved scope, cost, or schedule performance. Variances must be tracked and reported. They should not be eliminated, but mitigated through corrective actions. Baseline changes, if needed, are submitted for changes in technical scope, funding or directed changes.
116. Work Breakdown Structure. Used by the project management team to organize and define a project into manageable objectives and create a blueprint by which the steps leading to the completion of a project are obtained. It is an outline of the project that becomes more detailed under the subheadings or work packages.

ATTACHMENT 3
ACRONYMS

ALARA	As low as reasonably achievable
ANSI	American National Standards Institute
AoA	Analysis of Alternatives
AP	Acquisition plan
AS	Acquisition strategy
ASME	American Society of Mechanical Engineers
BCP	Baseline change proposal
BOD	Beneficial occupancy date
CCB	Change Control Board
CD	Critical decision
CDN	Chief of Nuclear Safety
CDNS	Chief of Defense Nuclear Safety
CDR	Conceptual design report
CE	Chief Executive for Project Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFO	Office of the Chief Financial Officer
CFR	Code of Federal Regulations
CMS	Corrective measures study
CNS	Chief of Nuclear Safety
CPARS	Contractor Performance Assessment Reporting System
CRD	Contractor Requirements Document
CSDR	Conceptual safety design report
CTA	Central Technical Authority
DBT	Design-basis threat

DEAR	Department of Energy Acquisition Regulation
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
EA	Environmental assessment
EAC	Estimate at completion
EIA	Electronic Institute of America
EIR	External independent review
EIS	Environmental impact statement
EM	(DOE) Office of Environmental Management
EO	Executive Order
ESAAB	Energy Systems Acquisition Advisory Board
ESPC	Energy savings performance contracts
EVM	Earned value management
EVMS	Earned Value Management System
FAR	Federal Acquisition Regulation
FDO	Fee Determining Official
FPD	Federal Project Director
FIMS	Facility Information Management System
FR	Federal Register
FY	Fiscal year
G	Guide
GAO	U.S. Government Accountability Office
GPP	General plant project
HPC	High-performance computing
ICE	Independent cost estimate
ICR	Independent cost review

IGCE	Independent government cost estimate
IMP	Integrated master plan
IMS	Integrated master schedule
IPA	<i>Intergovernmental Personnel Act</i>
IPMD	Integrated Program Management Division
IPMR	Integrated program management report
IPR	Independent project review
IPT	Integrated Project Team
ISMS	Integrated Safety Management System
KPP	Key performance parameter
LCB	Life-cycle baseline
LOE	Level of effort
M	Manual
MIE	Major items of equipment
MNS	Mission need statement
MR	Management reserve
M&O	Management and operating
NDIA	National Defense Industrial Association
NEPA	National Environmental Policy Act
NNSA	National Nuclear Security Administration
NRC	U.S. Nuclear Regulatory Commission
NQA	Nuclear Quality Assurance
O	Order
OBS	Organizational breakdown structure
ODC	Other direct costs
OE	Operating expense

OMB	Office of Management and Budget
OPC	Other project costs
OPI	Office of Primary Interest
ORR	Operational readiness review
P	Policy
PA	Preliminary assessment
PARS	Project Assessment and Reporting System
PASEG	Planning and Scheduling Excellence Guide
PB	Performance Baseline
PDRI	Project Definition Rating Index
PDS	Project Data Sheet
PDSA	Preliminary Documented Safety Analysis
PED	Project Engineering and Design
PEP	Project Execution Plan
PHAR	Preliminary Hazard Analysis Report
P.L.	Public Law
PM	Office of Project Management
PMB	Performance measurement baseline
PMBOK	Project management body of knowledge
PMCDP	Project Management Career Development Program
PME	Project Management Executive
PMRC	Project Management Risk Committee
PMSO	Project Management Support Office
PPEP	Preliminary project execution plan
PPR	Project peer review
PSO	Program Secretarial Officer

PMP	Project management plan
QA	Quality assurance
QAP	Quality Assurance Program
QPR	Quarterly project review
RA	Readiness assessment
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
RMP	Risk management plan
ROD	Record of decision
ROM	Rough-order-of-magnitude
SBAA	Safety Basis Approval Authority
SDS	Safety design strategy
SER	Safety evaluation report
SI	Site inspection
SPE	Senior Procurement Executive
SRE	Streamlined risk evaluation
STD	Standard
TEC	Total estimated cost
TIPR	Technical Independent Project Review
TPC	Total project cost
TMP	Technology maturation plan
TRA	Technology readiness assessment
TRL	Technology Readiness Level
UFGS	Unified Facilities Guide Specification

U.S.C.	United States Code
VE	Value engineering
VM	Value management
WBS	Work breakdown structure

ATTACHMENT 4
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