

SUPPLEMENTAL DIRECTIVE

NNSA SD 413.3

Approved: 05-18-2021
Chg. 1 (Admin. Chg.): 09-18-2024
Recertification Due: 09/18/2029

PROGRAM AND PROJECT MANAGEMENT FOR THE ACQUISITION OF CAPITAL ASSETS



NATIONAL NUCLEAR SECURITY ADMINISTRATION
Office of Infrastructure Acquisition and Project
Management

CONTROLLED DOCUMENT

OFFICE OF PRIMARY INTEREST (OPI):

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CHANGE TABLE

NNSA SD 413.3

Chg. 1 (Admin Chg.): 09-18-2024

PROGRAM AND PROJECT MANAGEMENT FOR THE ACQUISITION OF CAPITAL ASSETS

Location of Changes:

Page	Paragraph	Changed	To
Title Page	Office Of Primary Interest.	Office of Acquisition and Project Management.	Office of Infrastructure.
1	5.b.	b. An increase in the General Plant Project (GPP) minor construction threshold from \$10M to \$20M.	b. An increase in the General Plant Project (GPP) minor construction threshold from \$20M to the amount stated in 50 U.S.C. 2741(2).
1	6, 1st paragraph	The current line-item threshold defined by Congress begins at \$20M.	The current line-item threshold defined by Congress is stated in 50 U.S.C. 2741(2).
3	8.b.	Title changed from: Associate Administrator for Acquisition and Project Management (NA-APM-1).	Title changed to: Associate Administrator for Infrastructure (NA- 90-1).
4	8.b.(8).	Responsibility moved from 8.e.(1).	Responsibility moved to 8.b.(8).
4	8.c.	Title changed from: Director, Office of Enterprise Project Management (NA-APM-20).	Title changed to: Deputy Associate Administrator, Office of Design and Construction (NA-92).
4	8.e.	Title changed from: Associate Administrator for Safety, Infrastructure and Operations (NA-50-1).	Title changed to: Associate Administrator for Environment, Safety, and Health (NA-ESH).
8	8.11.	CONTACT. The Office of Enterprise Project Management, NA-APM-20, 202-586-9814, NA-APM- 20@nnsa.doe.gov.	CONTACT. The Office of Design and Construction, NA-92, 202-586-9814, na- 92dcteam@nnsa.doe.gov.
Appendix D	APD-1	May 31, 2018, Memorandum <i>Conceptual and Preliminary Design Implementation Guidance for NNSA Capital Line-Item Projects</i> removed.	Text from memorandum included in Appendix D introductory paragraph.
Appendix E	APE-1	May 31, 2013, Memorandum <i>Beneficial Occupancy Date Guidance for National Nuclear Security Administration Construction Projects</i> removed.	Text from memorandum incorporated into Appendix E.
Various	Updated throughout document.	Office of Acquisition and Project Management (NA-APM).	Office of Infrastructure (NA-90).
Various	Updated throughout document.	(NA-APM).	(NA-90).

Various	Updated throughout document.	Office of Safety, Infrastructure and Operations (NA-50).	Office of Environment, Safety, and Health (NA-ESH).
Various	Updated throughout document.	(NA-50).	(NA-ESH)
Various	Updated throughout document.		NNSA and DOE directive version numbers and issue dates updated.

PROGRAM AND PROJECT MANAGEMENT FOR THE ACQUISITION OF CAPITAL ASSETS

1. PURPOSE. Describes the National Nuclear Security Administration (NNSA) roles, responsibilities, and authorities as they relate to capital asset project management for line-item and major items of equipment (MIE) projects in accordance with Department of Energy (DOE) Order (O) 413.3B, *Program and Project Management for the Acquisition of Capital Assets*, or successor (herein referred to as DOE O 413.3). This Supplemental Directive (SD) will be applied in conjunction with, and may supplement, but will not supersede any requirements established by the current version of DOE O 413.3.
2. AUTHORITY. DOE Order 413.3B, Chg. ~~67~~, *Program and Project Management for the Acquisition of Capital Assets*, dated ~~16-121-243~~.
3. CANCELLATION. Business Operating Procedure (BOP) 413.7, *Program and Project Management for the Acquisition of Capital Assets*, dated 8-9-16.
4. APPLICABILITY.
 - a. Federal. This SD applies to all NNSA federal organizations.
 - b. Contractor. This SD does not apply to contractors.
 - c. Equivalency. In accordance with the responsibilities and authorities assigned by Executive Order 12344, codified at 50 United States Code sections 2406 and 2511, and to ensure consistency throughout 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.
5. SUMMARY OF CHANGES. ~~Administrative changes to adjust organization names. NNSA BOP 413.7, Program and Project Management for the Acquisition of Capital Assets, was reformatted to create this SD and incorporates the following updates:~~
 - a. ~~Administrative changes (e.g., to adjust organization names)~~ Updates reflected in DOE O 413.3.
 - b. ~~—~~ An increase in the General Plant Project (GPP) minor construction threshold from \$120M to ~~the amount stated in 50 U.S.C. 2741(2)~~ \$20M.
 - e.b. ~~Key changes to ensure that project requirements and conceptual design are managed by acquisition and project management professionals after completion of the Analysis of Alternatives (AoA) Alternative Selection Document (ASD).~~
6. BACKGROUND. This document defines accountability, responsibilities, and authorities while highlighting key factors that contribute to acquisition of capital assets across

NNSA and applies to capital asset line-item/MIE projects, as defined in DOE O 413.3, Attachment 2. The current line-item threshold defined by Congress [is stated in 50 U.S.C. 2741\(2\) begins at \\$20M](#).

This SD also reflects guidance from Office of Management and Budget (OMB) Circular A-11, the Federal Acquisition Regulation (FAR), Office of Federal Procurement Policy (OFPP) guidance, the DOE Acquisition Regulations (DEAR), DOE O 413.3, and the Department's acquisition and project management policies.

7. REQUIREMENTS.

- a. The capital asset project management process must be applied in conjunction with the requirements established by DOE O 413.3, specifically paragraph 3.a, "for projects having a total project cost (TPC) greater than \$50M, except where the Administrator has reduced the threshold to \$10M for nuclear or complex first-of-a-kind projects. ...The project management principles, as set forth in DOE O 413.3, Appendix C, Paragraph 1.a.-1., apply to all capital asset projects."
- b. As established by the NNSA policy decision, dated July 18, 2019, the Office of [Infrastructure Acquisition and Project Management](#) (NA-[90APM](#)) must assume the lead role for execution and appoint a Federal Project Director (FPD) after the completion of the AoA Alternative Selection Document until CD-4 approval.
- c. Technology readiness assessments (TRAs) must be developed in accordance with DOE Guide (G) 413.3-4A, *Technology Readiness Assessments Guide*, and NNSA Policy (NAP) 413.4, *Technology Readiness Assessments*.
- d. NNSA's peer review policy and independent project reviews (IPR) must be implemented in accordance with [SDBOP 413.3-14](#), *Project Reviews*.
- e. Independent cost estimates and reviews must be conducted in accordance with NAP 413.3A, *Responsibilities for Independent Cost Estimates*, and Government Accountability Office (GAO)-20-195G, *Cost Estimating and Assessment Guide*.
- f. Projects designated as Hazard Category 1, 2, or 3 nuclear facilities must comply with design safety requirements of DOE-Standard (STD)-1189-2016, *Integration of Safety in the Design Process*, DOE O 413.3 project management processes, and other applicable Codes of Federal Regulations (CFR).
- g. When approved by the NNSA Administrator, [Acquisition and Project Management Offices](#) ([APMO](#)) for Major System Acquisition (MSA) projects must be established by NA-[90APM](#) and led by a member of the Senior Executive Service (SES).
 - (1) The [APMO](#) is tailored and staffed with project management, acquisition, quality assurance, and technical subject matter expert(s) (SME) to ensure scaled and sufficient oversight is provided in

accordance with the DOE G 413.3-19, *Staffing Guide for Project Management*.

- (2) The [APMO](#) Director must have the appropriate acquisition and project management training, experience, and certification level to ensure a sound understanding of the FAR and a broad knowledge base from which to communicate performance expectations between Contracting Officer(s) (CO) and contractors so that NNSA successfully delivers on the expectations identified in its Inter-Agency Agreements (IA), contracts, and work authorizations.

8. RESPONSIBILITIES.

a. Administrator (NA-1).

- (1) Delegates Project Management Executive (PME) authority, as appropriate.
- (2) Designates a project owner before Critical Decision (CD)-1.
- (3) Ensures that the NA-~~APM~~[90](#) FPD appointed to non-major system projects is qualified and has appropriate communication skills and leadership characteristics prior to designation.
- (4) Serves as Chair and appoints members for Acquisition Advisory Boards.

b. Associate Administrator for ~~Infrastructure~~[Acquisition and Project Management](#) (NA-~~90APM~~[90APM](#)-1).

- (1) Assists the Heads of NNSA Elements in developing CD-0 documents.
- (2) Assumes the lead role in the execution of the project beginning with the completion of the AoA [Alternative Selection Document \(ASD\)](#) and continuing through the approval of CD-4 to include developing the project execution documentation based on the selected alternative for the project, developing and administering the acquisition strategy and procurement plan, and awarding and managing design and construction contracts/Inter-Agency Agreement(s) (IAs) to achieve the project baseline.
- (3) Ensures all CD activities post AoA approval are completed and ensures NNSA follows DOE's acquisition and project management requirements outlined in the DEAR, DOE O 413.3, and the Department's policies for aligning contracts and contract incentives with taxpayer interests.
- (4) Provides overall direction, strategic guidance, and management with

respect to the acquisition and management of capital asset projects and ensures that NNSA implements all applicable federal and departmental acquisition policies and regulations.

(5) Serves as a Member of the Project Management Risk Committee (PMRC) and coordinates projects greater than \$100M with the PMRC.

(6) Obtains full time equivalent (FTE) allocations for FPD billets from NA-1, hires, trains, supervises, and develops FPDs, and writes FPD appointment memoranda.

(7) Manages the PME initial delegation memoranda, and any subsequent delegations that may be appropriate if material changes in the project occur after the initial delegation, drafts all CD approval memoranda, and obtains subsequent approvals throughout the life of the project.

~~(7)~~(8) Enables safe operations, ensures effective infrastructure, and provides enterprise services to meet the 21st century nuclear security enterprise needs.

c. Director Deputy Associate Administrator, Office of Design and Construction Enterprise Project Management (NA-APM-929). Approves exemptions to this SD. This responsibility cannot be delegated.

d. Director, Office of Cost Estimating and Program Evaluation (NA-1.3-1).

(1) Advises NA-1 on policies and procedures for cost analysis, estimation, and AoAs. Conducts the independent review of the AoA as outlined in BOP 413.6, *Analysis of Alternatives*, or successor policy.

(2) Performs TRA responsibilities outlined in NAP 413.4, *Technology Readiness Assessments*.

(3) Manages all CD phase independent cost estimates/reviews as outlined in NAP 413.3A, *Responsibilities for Independent Cost Estimates*.

e. Associate Administrator for Environment, Safety, and Health Infrastructure and Operations (NA-ESH50-1).

~~(1)~~ Enables safe operations, ensures effective infrastructure, and provides enterprise services to meet the 21st century nuclear security enterprise needs.

(1) Works with the FPD in integrating safety into the design of nuclear construction projects and ensures DOE-STD-1189-2016, *Integration of Safety in the Design Process*, is implemented for Hazard Category 1, 2, and 3 nuclear facilities.

- (2) Provides Environmental, Safety & Health; Waste Management; Quality Assurance; and Nuclear Safety technical experts to support the Integrated Project Team (IPT) and NNSA's Independent Project Peer Reviews.
 - (3) Provides Guiding Principles for Sustainable Federal Buildings, Leadership in Energy & Environmental Design (LEED), and LEED Gold waiver technical experts to support project teams. Delegates Safety Basis approval to the Field Office Manager or approves Safety Basis documents when the Field Office Manager lacks Technical Qualification Program certification.
- f. Chief and Associate Administrator for Defense Nuclear Security (NA-70-1).
Ensures the field office security representatives to the IPT implement DOE's security orders and policies.
- g. Associate Administrator for Information Management (NA-IM-1).
 - (1) Ensures the Heads of NNSA Element's and field office's information management representatives to the IPT communicate and implement all DOE and NNSA Information Technology (IT) and cybersecurity orders and policies.
 - (2) Approves IT components in ~~the~~ design and procurement to ~~be~~ be in compliance ~~tee~~ with the *Federal Information Technology Acquisition Reform Act* (FITARA).
- h. Associate Administrator for Management and Budget (NA-MB-1).
 - (1) Serves as the lead for conducting NNSA initiated AoAs, in accordance with BOP 413.6, *Analysis of Alternatives*.
 - (2) At the discretion of the program offices and their specific budget allocations, ensures funds for NA-~~APM~~90 products and services come from the sponsoring NNSA Element's appropriated funds, the details of which are to be developed in accordance with the process in NNSA Policy (NAP) 130.1A, *Planning, Programming, Budgeting, and Evaluation (PPBE) Process*.
 - (3) Ensures programs comply with Department Orders, including DOE O 413.3, during the fiscal year Congressional budget process.
 - (4) Provides IPT representation to ensure programmatic cost estimates are developed in accordance with NNSA policies and best practices.
 - (5) Assists the Heads of NNSA Elements, if requested, in developing the Mission Need Statement (MNS) and Program Requirements Document

(PRD) to ensure an AoA can be accomplished in accordance with standard practices.

- i. Office of Project Analysis, Oversight, and Review (NA-~~APM90.2-1.1~~).
 - (1) Implements NNSA's peer review policy and conducts Independent Project Reviews (IPR) from CD-0 through CD-4, in accordance with DOE/NNSA requirements.
 - (2) Provides feedback independent of NA-~~APM90~~ or Heads of NNSA Elements through direct lines of communication to the Principal Deputy Administrator (NA-2).
 - (3) Serves as a member of the PMRC and briefs the PMRC on its IPRs.
- j. Heads of NNSA Elements.
 - (1) Lead the development of the Mission Need Statement (MNS) and establish the project requirements through the PRD.
 - (2) Participates in the AoA process in accordance with BOP 413.6, *Analysis of Alternatives*.
 - (3) Manage requirements generation, develop the budget requests, fund capital asset projects, including funding for FPD support governed by DOE O 413.3, and monitor and approve scope changes as identified in the Project Execution Plan (PEP) change control table.
 - (4) Upon project completion, assume responsibility for oversight of operations of the completed project in accordance with Beneficial Occupancy Date (BOD) guidance and verify that the mission need has been met.
 - (5) As a capital asset project progresses through the various CD phases, is responsible for the mission need, requirements, technical alternative selection, budgets, and funding of capital asset projects governed by DOE O 413.3.
- k. Field Office Managers.
 - (1) If the authority has been delegated, approve the Documented Safety Analysis and the Safety Evaluation Report.
 - (2) Upon project completion, provide oversight of operations of the completed project in accordance with BOD guidance and verify that the mission need was met.
- l. ~~Acquisition and~~ Project Management Office Directors (APMOs). Provide overall

direction, strategic guidance, and management of the project office in performance of all functions necessary to deliver the project in accordance with its original approved performance management baseline.

m. Federal Project Director (FPD).

- (1) Leads the IPT comprised of NNSA Elements and contractor personnel (when appropriate but not required) and serves as the single point of contact responsible for the overall execution of the project immediately after completion of the AoA ASD through CD-4.
- (2) Evaluates and verifies reported progress, provides project execution metrics in accordance with guidance provided by NA-[APM90](#), provides projections for future progress, and notifies senior management whenever project performance indicates a likelihood of performance baseline deviation.
- (3) Serves to support and defend the project cost, schedule, performance, and scope baselines, and ensures that the project receives adequate resources and expertise in all necessary areas.
- (4) Manages the CD-X performance baseline through monthly meetings and invites representatives from the NNSA Elements and NNSA field offices to attend to maintain situational awareness of project performance.
- (5) Serves as the Contracting Officer's Representative (COR), upon appointment.

n. Headquarters Project Manager (HQPM).

- (1) Serves as the project management professional in NA-[APM90](#) assigned to a project when an MNS and PRD begin development.
- (2) Serves as the primary advisor to the NNSA Elements to ensure that the effort approved at CD-0 has sufficiently developed requirements to proceed through pre-conceptual design to support the AoA. Helps ensure that the MNS and PRD requirements are sufficiently developed to allow the project to proceed with conceptual design if the selected alternative were to become a capital asset line-item/MIE project.
- (3) Serves as the FPD after the completion of the AoA Alternative Selection Document until one is assigned, and acts as the FPD in the absence of the FPD throughout the life of the project. Remains with the project through CD-4 and is the most knowledgeable on all aspects of project management policies and procedures at every stage of the project.

- (4) Ensures communication flows swiftly through HQ Elements, that decisions and actions are well documented, and are executed on a schedule.

o. Senior Management Team (SMT).

- (1) Comprised of SES representatives from the NNSA Elements identified in the CD-X Preliminary Project Execution Plan (PPEP).
- (2) Provides monitoring of the federal IPT, including providing input to complex issues and making decisions based on recommendations, through regular monthly meetings.
- (3) SMTs apply to all projects where the PME requests one be chartered.

p. Project Management Risk Committee (PMRC).

- (1) Reviews CD packages with values greater than or equal to \$750M for CD-0.
- (2) Reviews all CDs and makes recommendations to the pertinent PMEs and the Energy System Acquisition Advisory Board (ESAAB) for projects with a TPC greater than or equal to \$100M, for CD-1 through CD-4.
- (3) Receives out-briefs on all independent project peer reviews.

9. ACRONYMS. See Appendix F.

10. REFERENCES. See Appendix G.

11. CONTACT. The Office of [Design and Construction Enterprise Project Management](#), NA-[APM-920](#), 202-586-9814, na-[APM-92dcteam0](#)@nnsa.doe.gov.

BY ORDER OF THE ADMINISTRATOR:

~~Charles P. Verdon~~ [Jill M. Hruby](#)
Acting Administrator

Appendices:

- A. Project Process – Critical Decision Requirements
- B. Project Process – Overview of Roles and Responsibilities

- C. Project Process – DOE Acquisition Management System for Line-Item Capital Asset Projects
- D. Conceptual and Preliminary Design Guidance
- E. Beneficial Occupancy Guidance
- F. Acronyms/Abbreviations
- G. References

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APPENDIX A: PROJECT PROCESS – CRITICAL DECISION REQUIREMENTS

In order to apply project management best practices to capital asset projects post Analysis of Alternatives (AoA) approval, a performance baseline must be established. This performance baseline is defined as all cost, schedule, and scope required to complete all Critical Decision (CD) activities between each of the CD phase approvals (CD-X, where X is 1, 2, or 2/3, as applicable). Reporting progress for all phases of the project will be done following the applicable Office of [Infrastructure Acquisition and Project Management](#) (NA-[90APM](#)) standard practices.

1. Pre CD-0: Prepare Mission Need for Approval.
 - a. Develop Mission Need. When a credible performance gap is identified between current capabilities and those required to achieve the mission, the Heads of NNSA Elements lead the development of a Mission Need Statement (MNS) that translates mission need into functional requirements. The MNS must not be written to assume any particular solution, whether material or non-material. It is important that the Heads of NNSA Elements engage NA-[APM90](#) at this phase so a Headquarters Project Manager (HQPM) can be added to the project team. The HQPM provides assistance to ensure applicable standard practices, policies, and strategic guidance are followed to get the project off to a good start. Also see Department of Energy (DOE) Guide (G) 413.3-17, *Mission Need Statement*.
 - b. Prepare the Program Requirements Document (PRD). The Heads of NNSA Elements must develop and maintain the PRD during the life of the project, as required by Business Operating Procedure (BOP) 413.2 Admin Chg. 1, *Program Requirements Document for Construction Projects*. Before CD-1, the PRD provides the framework from a program perspective for NA-[APM90](#)'s development of the acquisition strategy.
 - c. Identify and Provide Funding. The responsible Heads of NNSA Elements establish the Rough Order of Magnitude cost range and provide funding for capital asset projects from appropriated funds. The Heads of NNSA Elements formulate the budget details in accordance with NAP 130.1A, *Planning, Programming, Budgeting, and Evaluation (PPBE) Process*. The Heads of NNSA Elements are responsible for ensuring adequate resources, including Other Direct Costs to support the FPD, are provided throughout the CD process.
2. Post CD-0/Pre CD-1: Prepare Alternative Selection and Cost Range for Approval.
 - a. Establish and Manage the Integrated Project Team (IPT). Upon approval of the mission need for a capital asset project, the Heads of NNSA Elements establish an IPT comprising NNSA field office personnel, NNSA Element personnel, project and acquisition professionals, subject matter experts, and contractors (when appropriate but not required) and other federal organizations. Leadership of the IPT transitions to the NA-[APM90](#) Federal Project Director (FPD) after completion of the AoA Alternative Selection Document (ASD). NA-[APM90](#)

assigns project and acquisition professionals to the IPT to support the development of all project requirements. It is important to include representatives from the Office of Environment, Safety, and Health Safety, Infrastructure, and Operations (NA-50ESH) to advise on nuclear safety ~~and infrastructure~~ issues; the Office of Defense Nuclear Security (NA-70) to advise on safeguards and security; the Office of Infrastructure (NA-90) to advise on the infrastructure lifecycle; the Office of Information Management (NA-IM) to advise on IT Standards, Enterprise Architecture, and Cybersecurity; and Management and Budget (NA-MB) to advise on AoA's and cost estimation, as well as other subject matter experts who would contribute to the success of the project. Also see DOE G 413.3-18A, *IPT Guide for Formation and Implementation*.

- b. FPD Appointment. NA-APM90 identifies the appropriately certified FPDs who can be assigned to specific projects. The FPD is assigned after completion of the AoA ASD.
- c. Develop Alternatives and Finalize AoA. For projects seeking CD-1 approval, NA-MB conducts an AoA that is independent of the contractor organization that would benefit from the proposed project (e.g., Management and Operating Contractor, [M&O]). The AoA must be conducted in accordance with SD 413.3-3BOP 413.6, Analysis of Alternatives. For additional information, see GAO-16-22, *AMPHIBIOUS COMBAT VEHICLE: Some Acquisition Activities Demonstrate Best Practices; Attainment of Amphibious Capability to be Determined*. It is important that the Heads of NNSA Elements engage early with NA-MB to understand the requirements for the AoA, both in terms of process and products. NA-1.3 will conduct an independent review of the completed AoA.
- d. Develop the Acquisition Strategy. NA-APM90 develops the acquisition strategy, in consultation with the Heads of NNSA Elements, to identify the high-level plan for satisfying the mission need in the most effective, economical, and timely manner. The Acquisition Strategy must be approved by the Program Secretarial Officer (PSO) prior to the CD-1 Energy System Acquisition Advisory Board (ESAAB) (or Equivalent Energy Systems Acquisition Advisory Board Equivalent (ESAAB-E) meeting. After approval of the Acquisition Strategy and CD-1, the responsible Contracting Officer (CO) develops and documents the Acquisition Plan to specify the contract type in accordance with sound business practices, statutory, regulatory, and policy requirements, which is approved by the Senior Procurement Executive or designee. For additional information, see NA-APM90 Standard Practice 02, *Acquisition Strategy*; DOE G 413.3-13, *Acquisition Strategy Guide for Capital Asset Projects*; DOE Acquisition Guide, Chapter 7; and Federal Acquisition Regulation (FAR) parts 7 and 34.
- e. Develop the CD-1 Preliminary Project Execution Plan (PPEP). NA-APM90 leads the development of the CD-1 PPEP, which describes the organizational framework and overall management system for the project from AoA approval to CD-1 approval. The CD-1 PPEP should be submitted for approval within 30 days

of the AoA approval. Concurrent with initiating the development of the CD-1 PPEP, NA-[APM90](#) leads the development of the Design Management Plan (DMP). After the CD-1 PPEP is approved, NA-[APM90](#) must develop the project's safety basis and CD-1 performance baseline to manage the cost, schedule, and scope to CD-1 approval. NA-[APM90](#), the program manager, and the Project Management Executive (PME) approve scope changes in accordance with the change control thresholds in the approved CD-1 PPEP. The CD-1 PPEP must include preliminary key performance parameters. For additional information see DOE G 413.3-15A, *Project Execution Plans*.

- f. Develop the DMP. NA-[APM90](#) leads the development of the DMP, which establishes the anticipated levels of design maturity at each CD phase. The DMP must be developed as early as possible after approval of the AoA to ensure that design activities are executed to the defined plan. The main purpose of the DMP is to define the approach for execution of design activities and to ensure that quality and consistency are maintained throughout the design process. The DMP includes the appropriate CD-1 and CD-2 performance baselines to manage the cost, schedule, and scope of the design effort. The DMP is tailored to both design-bid-build and design-build projects. For additional information see DOE G 413.3-1, *Managing Design and Construction Using Systems Engineering*.
- g. Develop the Conceptual Design. The NA-[APM90](#) FPD leads the conceptual design team. As a part of this effort, the FPD prepares a CD-1 PPEP that defines roles and responsibilities, a DMP, and implements a CD-1 performance baseline with change control protocols. Development of the conceptual design is an iterative process to define, analyze, and refine project concepts using a systems engineering methodology. The conceptual design conforms to the design guidance in Appendix D, (Conceptual and Preliminary Design Guidance). Progress updates and design development status are provided to senior leaders through monthly briefings.
- h. Develop the CD-2 PPEP. The FPD is responsible for updating the CD-1 PPEP to describe the organizational framework and overall management system for the project from CD-1 approval to CD-2 approval. The CD-2 PPEP must be approved prior to CD-1 approval. Included in the update to the PPEP, NA-[APM90](#) must identify the CD-2 performance baseline to manage the cost, schedule, and scope to CD-2 approval. NA-[APM90](#), the program manager, and PME approve scope changes in accordance with the change control thresholds in the approved CD-2 PPEP. For additional information see DOE G 413.3-15A, *Project Execution Plans*.
- i. Exemptions, Equivalencies, and Waivers. A project may seek exemptions or equivalencies to the requirements in DOE directives in accordance with the process described in DOE O 251.1D, *Departmental Directives Program*, Appendix E. Examples include an equivalency for fire protection system requirements, an exemption from a natural phenomenon hazard requirement, a

waiver from meeting Leadership in Energy & Environmental Design (LEED) Gold certification as required by DOE 413.3, etc. Such exemptions, equivalencies, and waivers represent a risk to the project until approved. Projects requesting an exemption, equivalency, or waiver should place a high priority on having the request approved before the final conceptual design report. If they are not approved prior to the final conceptual design report, the associated risk item(s) should be carried in the risk register and the project estimate should include the unrealized risk value. The Associate Administrator for [Infrastructure Acquisition and Project Management](#) (NA-90APM-1) may allow requests that have not been approved beyond the final conceptual design report under special circumstances and such items should be discussed as major issues in the monthly project reviews until disposition is completed.

3. Post CD-1/Pre CD-2: Prepare Performance Baseline for Approval.

- a. Baseline Development. NA-[APM90](#) formalizes the cost, schedule, and scope of a project at CD-2, and measures success against this baseline at project completion, including key performance parameters. The project requirements, identified in the approved PRD, and proposed funding profile are used to develop the project cost and schedule baseline. The FPD is responsible for developing the total project performance baseline, which is validated by NA-[APM90](#) or the DOE Office of Project Management (DOE-PM) based on the dollar threshold outlined in DOE O 413.3. The FPD obtains concurrence of the project baseline from the Heads of NNSA Elements, through concurrence on the Project Execution Plan (PEP), and obtains approval from the PME through the ESAAB process. The preliminary design must conform to the design guidance in Appendix D. Prior to baseline approval, nuclear project designs must conform to the design criteria specified in DOE O 413.3. During the period between CD-1 and CD-2, the FPD monitors the CD-2 performance baseline performance using project management principles and Earned Value Management (EVM) methodologies and techniques, in preparation for approval of CD-2, *Approve Performance Baseline*.
- b. Establish a Project Management Office (PMO), if applicable. A PMO provides a full-time team dedicated to the project to ensure project delivery is in accordance with the established cost, schedule, and scope baselines. For a Major System Acquisition (MSA) project, NA-[APM90](#) determines if a PMO should be established. Establishment of a PMO must be approved by the Administrator (NA-1).
- c. Develop the PEP. The FPD is responsible for drafting and updating the PEP prior to CD-2 approval. The PEP is a living document that is based on the CD-2 PPEP and must be updated to capture changes to project systems, processes, procedures, and personnel. The FPD, program manager, NA-[APM90](#), and PME approve scope changes in accordance with the change control thresholds in the approved PPEP or PEP.

- d. Plan for Site Integration. The FPD, Heads of NNSA Elements, through the IPT, establish a plan for site integration. Planning for site integration involves identifying site interface issues and infrastructure requirements in order to mitigate barriers to construction execution. Clear organizational interface and responsibilities need to be documented and agreed upon by all involved parties, as codified in the PPEP or PEP, Commissioning Plan, and Startup Plan, or as a standalone plan.
 - e. Award and Administer Design Contracts or Interagency Agreements (IAs). Design contracts or IAs are awarded and managed according to the DMP. NA-[APM90](#) or its agent awards design contracts, work authorizations, and IAs to support project requirements. To ensure successful outcomes, close coordination is expected between acquisition staff across the enterprise. Design progress and performance is measured against the CD-2 performance baseline.
 - f. For conventional, non-nuclear construction, the design can be less than 90% complete prior to CD-2. Through an IPR, NA-[APM90](#) ensures that adequate definition exists to provide a budget quality cost and schedule estimate for the total project performance baseline. Projects designated as Hazard Category 1, 2, or 3 nuclear facilities must achieve at least 90% design maturity before CD-2.
4. Pre CD-3A: Long Lead Procurements. A CD-3A package can be submitted in conjunction with another CD or separately. Some potential reasons to pursue a CD-3A authorization include the following:
 - a. Purchasing long-lead materials or long-lead equipment.
 - b. Fabrication requirements.
 - c. Limited site preparations — Some examples include removal of existing equipment or acquiring the lay-down area.
 5. Pre CD-2/3: Approve Performance Baseline and Start of Construction Execution. The preparations for a CD-2/3 submittal package include all the activities necessary for both the CD-2 and CD-3 submission combined in the same submittal package. A CD-2/3 approval is particularly useful when pursuing design-build.
 6. Post CD-2/Pre CD-3: Prepare for Construction Execution Start.
 - a. Complete Project Design. After the Project Baseline is approved, the FPD completes the project definition/design, begins to execute the Acquisition Strategy, and initiates early procurements.
 - b. Manage the Project Baseline. The FPD manages the project baseline by overseeing and evaluating the progress of the project through CD-4. The FPD evaluates performance against cost, schedule, and scope. NA-[APM90](#) monitors performance through monthly meetings and invites representatives from the

Heads of NNSA Elements to attend to maintain situational awareness of project performance.

- c. The FPD updates the baseline in accordance with the change control thresholds in the PEP when there is a new requirement or a change to the cost, schedule, or scope.

7. Post CD-3/Pre CD-4: Prepare for Start of Operations or Project Completion.

- a. Award Construction Contracts and IAs. NA-[APM90](#) or its agent awards construction contracts, work authorizations, and IAs to support project requirements. To ensure successful outcomes, close coordination is expected between contracting staff across the enterprise.
- b. Manage Construction Contracts and IAs. NA-[APM90](#) or its agent oversees and manages construction services through contracts and IAs to achieve the project baseline.
- c. Manage Site Integration Issues. The FPD takes the lead role in managing any site integration issues, in support of construction activities, with the NNSA Elements, Nuclear construction projects must also comply with design safety requirements of DOE-STD-1189-2016, *Integration of Safety in the Design Process*.
- d. Prepare for Transition to Operations. In close coordination with Heads of NNSA Elements, the FPD is responsible for developing and managing startup, turnover, and closeout plans in accordance with DOE O 413.3. Activities include checkout, testing, and operations acceptance; completing a transition to operations plan; performing final project inspections; conducting a commissioning evaluation; and preparing for an Operational Readiness Review, a Readiness Assessment, or a Readiness to Operate Assessment. Heads of NNSA Element's involvement in these activities is essential for project success.
- e. Establish Beneficial Occupancy Date (BOD). The 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 CD-4. The BOD is the date that follow-on contracts/activities (if any) such as information technology or furniture installations may begin. For large projects there may be multiple BODs and the BOD does not replace CD-4. A construction schedule identifying the BOD is developed and used as the basis for establishing reasonable contract duration(s) at CD-2. The scheduled BOD is reviewed in conjunction with routine monthly project reporting and adjusted as required to reflect the best estimate for when the BOD actually occurs. Revisions to the scheduled BOD must be reviewed and coordinated with the FPD and customer prior to being entered into the change control process.

8. Post CD-4: Prepare for Project Closeout.

- a. Accept Project for Operations. Heads of NNSA Elements verify the mission need and project requirements are met and accept the project for operation in accordance with the PEP.
- b. Turnover to Operations and Conduct Closeout Activities. Upon acceptance, the FPD continues to provide monthly project reviews with all IPT members until closeout activities are completed. This includes completing any punch list items, managing warranty issues, completing contracts/IAs, and conducting closeout activities.
- c. Project Closeout. The FPD prepares the project documents for PME approval, schedules the ESAAB or ESAAB-E, and officially closes the project out in the DOE Project Assessment and Reporting System. Also see [BOP-413.8SD 413.3-6](#), *Energy Systems Acquisition Advisory Board Equivalent (ESAAB-E) Process* for more information on the ESAAB process.

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APPENDIX B: PROJECT PROCESS – OVERVIEW OF ROLES AND RESPONSIBILITIES

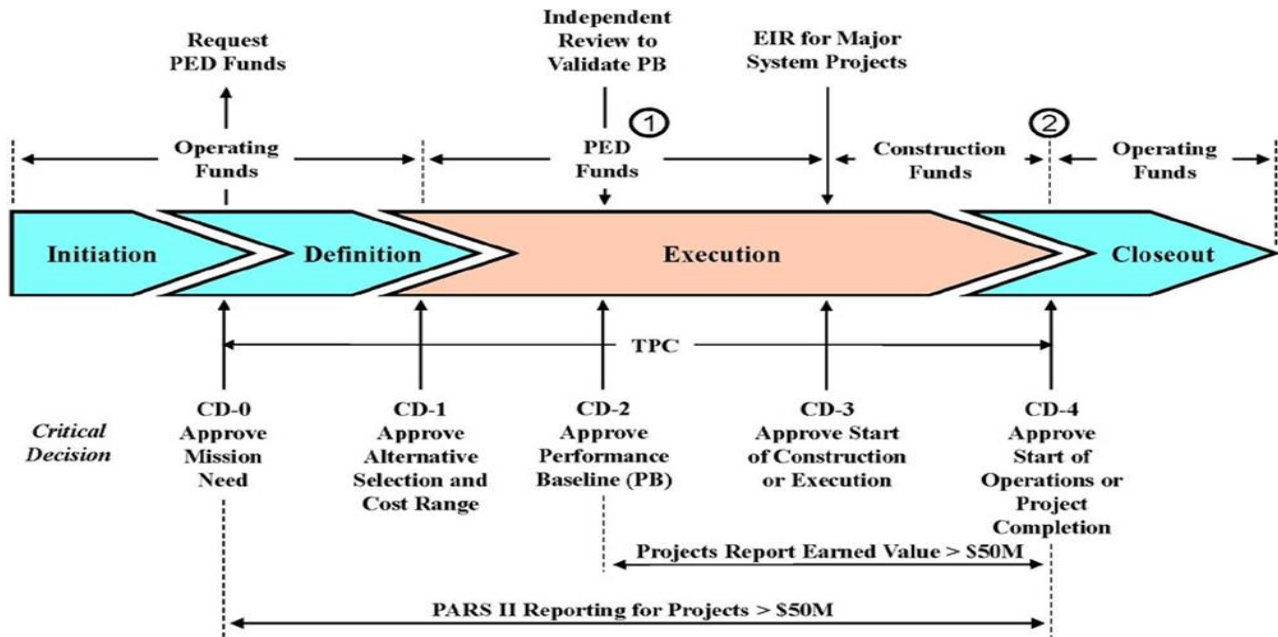
<u>Project Phase</u>	<u>Office of Infrastructure Acquisition and Project Management (NA-90APM) Roles & Responsibilities</u>	<u>Heads of NNSA Elements Roles & Responsibilities</u>
Pre CD-0: Approve Mission Need	<u>Support:</u> Be aware of the need for a capital asset project and appoint a Headquarters Project Manager (HQPM) to provide assistance, as needed. Review and support the development of the cost range.	<u>Lead:</u> Generate mission need and program requirements. Finalize the Mission Need Statement (MNS) and Program Requirements Document (PRD). Identify and provide funding. Establish the Rough Order of Magnitude cost range.
Pre CD-1: Approve Alternative Selection and Cost Range	<u>Lead:</u> After completion of the Analysis of Alternatives (AoA) Alternative Selection Document (ASD): Assign the NA-APM90 Federal Project Director (FPD). Manage the conceptual design with change control discipline. Ensure that project requirements are met. Develop the acquisition strategy and procurement plan. Develop the Preliminary Project Execution Plan (PPEP). Develop the Design Management Plan. Develop the Critical Decision (CD)-1 performance baseline with protocols for change control. Assign acquisition professionals to the Integrated Project Team (IPT). <u>Support:</u> Prior to completion of the AoA ASD. Assist in AoA development and analysis. Identify the FPD that will be assigned to manage the project.	<u>Lead:</u> Prior to completion of the AoA ASD: Establish and manage the Integrated Project Team (IPT). Conduct the AoA. Develop project budget and supporting Project Data Sheets. Identify and provide funding. <u>Support:</u> After completion of the AoA ASD: Review the Design Management Plan (DMP) and the CD-1 performance baseline. Assist in preparation and approval of the PPEP. Approve scope changes per the change control table in the PPEP. Review conceptual design deliverables and approve any deviations from the DMP or CD-1 performance baseline.
Pre CD-2: Approve Performance Baseline	<u>Lead:</u> Agree to a cost based on approved scope and schedule. Award design contracts/IAs to support project requirements. Develop the CD-2 performance baseline. Complete project design and begin/manage design and development of project execution documentation on the selected alternative for the project. Develop the Project Execution Plan (PEP). Develop project baseline. Prepare request to the Project Management Executive (PME) for approval of project	<u>Lead:</u> Manage/adjust project requirements, as necessary, to meet mission needs. Concur with proposed baseline and manage/establish project budget accordingly. <u>Support:</u> Review design deliverables. Assist in the preparation and development of the CD-2 performance baseline, PEP, and acquisition strategy and, ultimately, provide concurrence/approval of the final products.

	baseline. <u>Support:</u> Incorporate any changes in project requirements identified by the Heads of NNSA Elements.	
Pre CD-3: Approve Start of Construction Execution	<u>Lead:</u> Initiate acquisition award construction contracts/Inter-Agency Agreement(s) (IAs). Through IPT, identify and plan for site integration. Initiate early procurements. Manage project baseline. <u>Support:</u> Work with Heads of NNSA Elements to mitigate barriers to construction execution. Develop and adjust requirements to accommodate any changes to the project identified by the Heads of NNSA Elements. Provide information necessary for trade-off analysis and decisions.	<u>Lead:</u> Make trade-off decisions during design that impact project requirements or costs. Identify any changes required to meet mission needs. Identify site integration issues. Provide funding in accordance with approved baseline. <u>Support:</u> Participate in monthly project reviews to ensure project requirements are met.
Pre CD-4: Approve Start of Operations or Project Completion	<u>Lead:</u> Manage construction contract(s)/IAs to achieve project baseline. Manage site integration issues. Identify and request baseline changes for any unforeseen changes or project requirement changes identified by the Heads of NNSA Elements. Perform project final inspections and commissioning evaluation. Initiate and execute pre-operational readiness evaluations. Implement approved changes identified by the Heads of NNSA Elements.	<u>Lead:</u> Identify any changes required to meet mission needs/project requirements. Approve Documented Safety Analysis and Safety Evaluation Report, if applicable. Manage project budget. Initiate plan for future operations of completed project. <u>Support:</u> The Chief of Defense Nuclear Safety (NA-70-1) is responsible for ensuring DOE-STD-1189-2016 is integrated into the project. The Field Office Manager is responsible for approving the Documented Safety Analysis and the Safety Evaluation Report, if applicable. Defense Nuclear Security (NA-70) is responsible for integrating security into the project.
Post CD-4: Project Closeout	<u>Lead:</u> Turnover completed project to operations. Complete any punch list items and manage warranty issues. Complete contract(s) and project closeout activities.	<u>Lead:</u> Evaluate/accept project for operations and verify mission need/requirements are met.

*This table is a summary with specific roles and responsibilities outlined in accordance with the PPEP/PEP.

APPENDIX C: DOE ACQUISITION MANAGEMENT SYSTEM FOR LINE-ITEM CAPITAL ASSET PROJECTS

The DOE Acquisition Management System for Line-Item Capital Asset Projects Illustration is provided for context to explain NNSA's Capital Asset Acquisition and Project Management



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.

process.

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APPENDIX D: CONCEPTUAL AND PRELIMINARY DESIGN GUIDANCE

Conceptual and preliminary designs are key deliverables that provide essential feedback to the integrated project team (IPT) to ensure that the project meets requirements, fulfills the mission need, and is safely delivered on budget. Experience demonstrates that significant risks and opportunities are best managed during the process of conceptual and preliminary design development while the cost to implement change is minimal. The best opportunity to resolve applicable risks, which will allow for more accurate cost estimates and performance baselines, fewer cost increases, and minimal schedule delays, is early in the design process. Many of these typical project problems can be mitigated by providing sufficient funding for conceptual and preliminary designs. To better manage our capital line-item projects, the following implementation guidance is provided to standardize the deliverables for conceptual and preliminary designs.

The goal of this implementation guidance is to provide consistency for the conceptual and preliminary design package deliverables. Following this guidance ~~will~~ ensures that the design of systems, structures, components, and other facility attributes are sufficiently mature for meaningful conceptual and preliminary designs and their associated cost estimates. This guidance also provides key cost relationships to ensure sufficient funding is provided to deliver

[these design packages.](#)



Department of Energy
National Nuclear Security Administration
Washington, DC 20585



MAY 31 2018

MEMORANDUM FOR DISTRIBUTION

FROM: ROBERT B. RAINES
ASSOCIATE ADMINISTRATOR
FOR ACQUISITION AND PROJECT MANAGEMENT

SUBJECT: Conceptual and Preliminary Design Implementation Guidance for
National Nuclear Security Administration (NNSA) Capital Line Item
Projects

Conceptual and preliminary designs are key deliverables that provide essential feedback to the integrated project team (IPT) to ensure that the project meets requirements, fulfills the mission need, and is safely delivered on budget. Experience demonstrates that significant risks and opportunities are best managed during the process of conceptual and preliminary design development while the cost to implement change is minimal. The best opportunity to resolve applicable risks, which will allow for more accurate cost estimates and performance baselines, fewer cost increases, and minimal schedule delays, is early in the design process. Many of these typical project problems can be mitigated by providing sufficient funding for conceptual and preliminary designs. To better manage our capital line item projects, the following implementation guidance is provided to standardize the minimum required deliverables for conceptual and preliminary designs.

The goal of this implementation guidance is to provide consistency for the conceptual and preliminary design package deliverables. This will ensure that the design of systems, structures, components, and other facility attributes are sufficiently mature for meaningful conceptual and preliminary designs and their associated cost estimates. This guidance also provides key cost relationships to ensure sufficient funding is provided to deliver these design packages. This guidance is effective immediately for all capital line item projects executed under DOE O 413.3B.

Federal Project Directors, as leaders of IPTs, are responsible for the implementation of this guidance. Questions should be directed to Mr. Cameron Manning, Director, Office of Enterprise Project Management (NA-APM-20) at 202-586-6567.

Attachments (3)

1. General Conceptual and Preliminary Design Guidance
2. Conceptual Design Deliverables
3. Preliminary Design Deliverables



Conceptual and Preliminary Design General Guidance

Item	Project Type	Conceptual Design	Preliminary Design
General Definition	Hazard Category 1, 2, or 3 Nuclear Facility	A design milestone at which efforts are refocused from alternative comparisons and selection to the production of an initial design that integrates safety-in-design in accordance with DOE-STD-1189 and DOE Order 413.3 project management processes.	A design milestone that occurs between conceptual design and the final design. Preliminary design advances the conceptual design to reflect a more mature safety basis in accordance with DOE-STD-1189 and other DOE Order 413.3 project management processes. The preliminary design transitions to formal configuration control to ensure the final design fulfills the mission need.
	All Other Facilities	The design milestone at which efforts are refocused from alternative comparisons and selection to the production of an initial design that integrates project requirements and DOE Order 413.3 project management processes.	The design milestone that occurs between conceptual design and the final design. Preliminary design advances the conceptual design complying with project requirements, DOE Order 413.3 project management processes, and transitions to formal configuration control to ensure the final design fulfills the mission need.
Design Maturity	Hazard Category 1, 2, or 3 Nuclear Facility	30%	60%
	All Other Facilities	15%	40%
Estimate Class ¹	Hazard Category 1, 2, or 3 Nuclear Facility	Association for the Advancement of Cost Engineering International (AACEI) Class 4	AACEI Class 3
	All Other Facilities	AACEI Class 3	AACEI Class 2
Design Cost Relationships ²			
As a percentage of total project cost	Hazard Category 1, 2, or 3 Nuclear Facility	5%	15%
	All Other Facilities	1%	2%
As a percentage of total construction costs	Hazard Category 1, 2, or 3 Nuclear Facility	7%	20%
	All Other Facilities	1%	3%
	Hazard Category 1, 2, or 3 Nuclear Facility	25%	75%

As a percentage of total design costs	All Other Facilities	15%	30%
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1. Reference AACEI Recommended Practice 18-R-97, *Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries*, dated 1 March 2016, for additional information on AACEI estimating classes.
2. Design cost relationships include “all-in” costs except for the DOE-held contingency and DOE other direct costs. The cost relationships for preliminary design are cumulative values.

Conceptual Design Deliverables for Capital Line-Item Projects

All deliverables are assumed to be based on best available information and unsuitable for issuance for final design, procurement, or construction. The degree of completion for the deliverables are defined as outlined below.

- **N/A** – Deliverable is not applicable or required.
- **Conceptual** – Work on the deliverable is not advanced with interim and cross-functional reviews typically completed. Often the deliverable is assigned an alpha revision number rather than a numeric revision number to designate that it is not under a formal configuration control system.
- **Complete** – Work on the deliverable is complete and the final configuration has been reviewed (both intra- and inter-discipline) and approved. The deliverable is assigned a numeric revision number to designate that it is under a formal configuration management process because changes to the deliverable may result in major schedule and cost impacts. The deliverable will continue to be revised under a formal configuration management process as the design matures to 100%.

Conceptual Design Deliverables

Category	Requirement / Deliverable	Degree of Completion	
		Haz Cat 1, 2, or 3 Nuclear Facility	All Other Facilities
Architectural	- Elevation drawings - General (finished floor plan, reflected ceiling plan, finish schedule) - Life safety plan/reports/drawings - Plan and section drawings - Select typical details	Conceptual	Conceptual
Basis of Design	- Code of Record - System design descriptions (or alternative)	Conceptual	N/A
	- Design criteria - Operations, maintenance, and radiation protection requirements - Scope of facilities/interface control documents - Security design requirements document - System requirements identified	Conceptual	Conceptual
Civil	- Construction specifications - Excavation and structural fill plan - Studies/analyses/drawings/plans	Conceptual	Conceptual

Conceptual Design Deliverables

Category	Requirement / Deliverable	Degree of Completion	
		Haz Cat 1, 2, or 3 Nuclear Facility	All Other Facilities
	- Qualitative geotechnical comparison of site alternatives - Geotechnical review and evaluation of past projects and proposed use area	Complete	Complete
	Geotechnical Report	Complete	Conceptual
Electrical	- Drawings and plans - Electrical load list - Identify applicable codes and standards - One-line diagram - Power distribution system layout (load centers, switchgear, Motor Control Centers (MCCs) panel boards. Substation layout drawings (as applicable, include distribution system to new facility duct bank, overhead lines)	Conceptual	Conceptual
Environmental Management	- Environmental compliance strategy - National Environmental Policy Act strategy determination	Complete	Complete
Fire Protection	- Identify applicable codes and standards - Commodity lists (e.g., valve list, equipment list) - Major equipment sizing design analysis calculations - Piping and instrumentation diagram (P&IDs) - Piping diagrams (including sprinkler heads)	Conceptual	Conceptual
	System design descriptions	Complete	Complete
Heating, Ventilation, and Air Conditioning (HVAC)	- Identify applicable codes and standards - Air flow diagrams - Preliminary duct routing (major runs) - Preliminary equipment list - Preliminary heating/cooling loads - Ventilation and instrument diagrams	Conceptual	Conceptual
	System design description	Complete	Complete
Instrumentation & Controls (I&C)	Control requirement general strategy (manual, semi, automatic) for safety instrumented system (SIS) & basic process control system (BPCS) requirements	Conceptual (BPCS & SIS)	Conceptual (BPCS only)
	- Control system architecture (implementation strategy for compliance with requirements) - Input/output list - Identify applicable codes and standards - Issue drawings depicting I&C sensors and end devices. These may be drawings that are owned by others (e.g., process engineering, mechanical, HVAC)	Conceptual	Conceptual
Mechanical, Process, Piping	- Calculations/ analyses/reviews for commodities such as gloveboxes, skids - Identify applicable codes and standards - Major equipment sizing design analysis calculations - Mechanical equipment list (MEL) - Preliminary P&IDs - Process flow diagrams (PFDs); material and energy balance, utility flow diagrams	Conceptual	Conceptual

Conceptual Design Deliverables

Category	Requirement / Deliverable	Degree of Completion	
		Haz Cat 1, 2, or 3 Nuclear Facility	All Other Facilities
	- Reliability, availability, and maintainability parameters identified for key systems - Throughput analysis - Utility demand		
Mechanical, Process, Piping	System design descriptions	Complete	Complete
Plant Design	3D model software 3D model: major commodities - Space allocation plan implemented - General arrangement drawings - Plot plan - Select piping specifications/piping class sheets	Conceptual	Conceptual
Safety in Design and Safety Basis	- Conceptual Design Report - Configuration management process - Integrated Safety Management Plan - Major modification determination (for any modification requiring design) - Preliminary Fire Hazard Analysis for the preferred alternative - Risk and opportunities assessments	Complete	Complete
	- Preliminary security vulnerability assessment - Conceptual Safety Design Report - Criticality safety program document and studies/analyses (e.g., nuclear criticality safety assessments/evaluations and criticality safety process studies) - DOE prepares a Conceptual Safety Validation Report - Safety design strategy - Specify safety functions & classifications for structures and facility level systems	Complete	N/A
	Preliminary Hazard Analysis Report	N/A	Complete
Structural	- Base mat drawings - Concrete/steel drawings - Framing plans/sections - Preliminary finite element model for structural analysis - Scoping calculations (preliminary) - Structural design drawings/plans	Conceptual	Conceptual

Preliminary Design Deliverables for Capital Line-Item Projects

All deliverables are based on best available information and unsuitable for issuance for final design, procurement, or construction. The degree of completion for the deliverables are defined as outlined below.

- **N/A** – Deliverable is not applicable or required.
- **Preliminary** – Work on the deliverable has matured beyond conceptual with interim and cross-functional reviews typically completed, but not approved as final. A minimum of two reviews is typical if the deliverable was initially developed in the conceptual design phase. Some deliverables (e.g., selected enlarged floor plans, lightning protection drawings, etc.) may be issued for the first time in preliminary design. The deliverable is assigned a numeric revision identifier to designate that it is under a formal configuration management process because changes to the deliverable may result in major schedule and cost impacts. This is particularly true for design media and safety basis documents. Deliverable will continue to be revised, under a formal configuration management process, as the design matures to 100%.
- **Complete** – Work on the deliverable is complete and has been reviewed (both intra- and inter-discipline) and approved as final. The deliverable is assigned a numeric revision identifier to designate that it is under a formal configuration management process because changes to the deliverable may result in major schedule and cost impacts. The deliverable will continue to be revised under a formal configuration management process as the design matures to 100%.

-Preliminary Design Deliverables

Category	Requirement / Deliverable	Degree of Completion	
		Haz Cat 1, 2, or 3 Nuclear Facility	All Other Facilities
Architectural	• Leadership in Energy & Environmental Design (LEED) scorecards	Complete	Complete
	• Drawings (general) • Finish schedule; door schedule • Interior design • Life safety plans/reports/drawings • Major floor plans • Major sections and elevation drawings • Remaining typical detail and select specific detail drawings, if required • Selected enlarged floor plans	Preliminary	Preliminary
Basis of Design	• Preliminary reliability, availability, maintainability, and inspectability analysis • Scope of facilities/interface control documents	Preliminary	Preliminary
	• Code of Record	Complete	N/A
	• Design criteria • System requirements identified	Complete	Complete
Civil	• Studies/analyses/drawings/plans	Preliminary	Preliminary
	• Geotechnical Report	Complete	Complete

-Preliminary Design Deliverables

Category	Requirement / Deliverable	Degree of Completion	
		Haz Cat 1, 2, or 3 Nuclear Facility	All Other Facilities
Electrical	- Drawings (general) - Electrical load list - Electrical load study design analysis calculations - Equipment grounding plans - Heat load design analysis calculations issued (electrical equipment and power cabling) - Lightning protection drawings and details - Overall ground grid plan - Panel/MCC/switchgear schedules - Single-line diagrams	Preliminary	Preliminary
Environmental Management	Environmental qualification for safety SSCs	Complete	N/A
	National Environmental Policy Act (NEPA) Strategy	Complete	Complete
Fire Protection	- Exemptions and equivalencies for fire protection - Fire protection system design description - Fire protection utility flow diagrams, P&IDs, sprinkler distribution drawings and alternative fire protection/suppression systems - Section and detail drawings - Design analysis calculations	Preliminary	Preliminary
General	- Construction specifications, if applicable - Equipment and material service requisitions, if applicable	Complete	Complete
Heating, Ventilation, and Air Conditioning (HVAC)	- Air flow diagrams - Ventilation and instrumentation diagram (V&IDs) and associated lists	Complete	Complete
	- Air flow design analysis calculations - Confinement zone drawings - Duct sizing and fan supply/exhaust design analysis calculations - Heating/cooling load calculations - System design descriptions	Preliminary	Preliminary
Instrumentation & Controls (I&C)	- Cabinet/panel layouts - Control strategy for process and safety systems - Instrument/panel location drawings - Instrument installation details - Instrument list/equipment list - Instrument specifications - Security systems layouts - Telecommunication systems architectural drawings	Preliminary	Preliminary
	Major equipment specifications	Complete	Complete
	Safety integrity level (SIL) calculations in schedule OR compliant with IEEE 379	Complete	N/A
Mechanical, Process Piping	- Equipment and fabrication specifications for specialty equipment, if applicable - Material energy balance (MEB) - Mechanical handling diagrams (MHDs) - P&ID Lists (equipment, valve, line, specialty items) - P&IDs for process and utility systems - Process Flow Diagram(PFDs) for process and utility systems	Complete	Complete

-Preliminary Design Deliverables

Category	Requirement / Deliverable	Degree of Completion	
		Haz Cat 1, 2, or 3 Nuclear Facility	All Other Facilities
	- Throughput analysis - System design descriptions for process systems - System design descriptions for utilities		
Mechanical, Process Piping	Environmental qualification for Safety Structures, Systems, and Components (SSCs)	Complete	N/A
	- Common component drawings for commodities such as gloveboxes and process skids - Drain sizing design analysis calculations - Electrical load tabulations - Equipment requirement reports (e.g., ergonomic analysis, time and motion studies, corrosion/erosion evaluations) - Hydraulic evaluation/line sizing/equipment sizing design analysis calculations - Mechanical assembly layout drawings - Pipe loading design analysis calculations - Process gas flow design analysis calculations	Preliminary	Preliminary
Plant Design	3D model: major commodities (HVAC, pipe, gloveboxes, radio hoods). 3D model: major equipment modeled	Complete	Complete
	3D model: process equipment and supports are modeled, if applicable for CD-3A - Equipment location drawings - General arrangement drawings - Material specifications - Piping specifications/piping class sheets - Plot plan	Preliminary	Preliminary
Safety in Design and Safety Basis	- Preliminary fire hazards analysis - Checkout/Testing/Commissioning Plan - Hazard analysis report - Preliminary security vulnerability assessment - Risk and opportunities assessment	Complete	Complete
	- Summary of key design activities - Functional classification and Natural Phenomena Hazard Design Category categorization for all Safety Class, Safety Significant, and Defense-in-Depth SSCs - Preliminary safety and design results - Safety design strategy	Complete	N/A
	- Criticality safety studies (e.g., nuclear criticality safety assessments/evaluations and criticality safety process studies) - Hazard analysis documents - Hazard and accident analysis - Preliminary quality level determinations or functional classifications for all systems	Preliminary	N/A

-Preliminary Design Deliverables

Category	Requirement / Deliverable	Degree of Completion	
		Haz Cat 1, 2, or 3 Nuclear Facility	All Other Facilities
Structural	- Anchor force and member sizing design analysis calculations for mechanical equipment and large electrical equipment, including electrical/instrument trays or racks - Material specifications - Selected material requisitions - Structural design analysis calculations	Preliminary	Preliminary
	Seismic evaluation study	Complete	Complete

APPENDIX E: BENEFICIAL OCCUPANCY GUIDANCE

The Beneficial Occupancy Date (BOD) is the date mutually established by the Integrated Project Team (IPT), customer, and user as to when the work will be transferred and accepted by the customer. At BOD, there are typically punch list items and other minor construction activities remaining. The BOD ~~will be the date~~ is when the project is officially transferred to the customer for occupancy and intended use, and for follow-on contracts/activities (if any) such as information technology and furniture installations. BOD is defined as substantial completion and/or when the facility or construction can be used for its intended purpose. For large projects there may be multiple BODs. The BOD does not take the place of Critical Decision (CD)-4 and in general is to be used to accept occupancy of specific facilities or portions of a large project.

The following actions ~~shall~~ must be taken to provide consistency of process across NNSA:

1. The designer of record ~~shall~~ must develop a construction schedule prior to solicitation for all construction projects. The schedule ~~shall~~ must be reviewed as part of the independent technical, biddability, constructability, operability, and environmental reviews of the final working drawings and specifications and be used as the basis for establishing reasonable contract duration(s) at CD-2.
2. The scheduled BOD will be reviewed in conjunction with routine monthly project reporting and adjusted as required to reflect the best estimate for when the BOD will occur. Revisions to the scheduled BOD ~~shall~~ must be reviewed and coordinated with the Federal Project Director (FPD) and subsequently the customer prior to being entered into the change control process.



Department of Energy
National Nuclear Security Administration
Washington, DC 20585



MAY 31 2013

MEMORANDUM FOR DISTRIBUTION

FROM: ROBERT B. RAINES 
ASSOCIATE ADMINISTRATOR
FOR ACQUISITION AND PROJECT MANAGEMENT

SUBJECT: Beneficial Occupancy Date Guidance for National
Nuclear Security Administration Construction Projects

I am issuing implementation guidance for beneficial occupancy, which will be effective immediately for all National Nuclear Security Administration (NNSA) projects. The Beneficial Occupancy Date (BOD) is the date mutually established by the Integrated Project Team (IPT), customer and user, as to when the work will be transferred and accepted by the customer. At BOD, there are typically punch list items and other minor construction activities remaining. The BOD will be the date the project is officially transferred to the customer for occupancy and intended use, and for follow-on contracts/activities (if any) such as information technology or furniture installations. This is considered to be substantial completion or when the facility or construction can be used for its intended purpose. For large projects there may be multiple BODs. The BOD does not take the place of CD-4 and in general is to be used to accept occupancy of specific facilities or portions of a large project.

The following actions shall be taken to provide consistency of process across NNSA:

1. The designer of record shall develop a construction schedule prior to solicitation for all construction projects. The schedule shall be reviewed as part of the independent technical, bidability, constructability, operability and environmental reviews of the final working drawings and specifications and be used as the basis for establishing reasonable contract duration(s) at CD-2.
2. The scheduled BOD will be reviewed in conjunction with routine monthly project reporting and adjusted as required to reflect the best estimate for when the BOD will actually occur. Revisions to the scheduled BOD shall be reviewed and coordinated with the Federal Project Director (FPD) and subsequently the customer prior to being entered into the change control process.



The FPDs will be responsible for the implementation of this guidance and any questions should be directed to Michael Hickman, Director, Office of Enterprise Project Management at (202)586-8872.

cc: M. Hickman, NA-APM-20

Distribution:

M. Lempke, NA-00
D. Cook, NA-10
A. Harrington, NA-20
S. Asher, NA-70
D. Nichols, NA-SH-1
P. Bosco, DOE-APM

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APPENDIX F: ACRONYMS/ABBREVIATIONS

a.	<u>AACEI</u>	Association for the Advancement of Cost Engineering International
b.	<u>AoA</u>	Analysis of Alternatives
c.	<u>APM</u>	Acquisition and Project Management
d.	<u>APMO</u>	Acquisition and Project Management Office
e-c.	<u>ASD</u>	Alternative Selection Document
f.d.	<u>BOD</u>	Beneficial Occupancy Date
g.e.	<u>BPCS</u>	Basic Process Control System
h.f.	<u>CD</u>	Critical Decision
i.g.	<u>CD-X</u>	Critical Decision-X, where (X) is 1,2,3
h.	<u>CO</u>	Contracting Officer
j-h.	<u>COR</u>	Contracting Officer Representative
k-i.	<u>DEAR</u>	DOE Acquisition Regulations
l-j.	<u>DMP</u>	Design Management Plan
m-k.	<u>DOE-PM</u>	DOE Office of Project Management
n-l.	<u>EIR</u>	External Independent Review
o-m.	<u>ESAAB</u>	Energy Systems Acquisition Advisory Board
n.	<u>ESAAB-E</u>	Energy Systems Acquisition Advisory Board — Equivalent
p-o.	<u>ESH</u>	<u>Office of Environment, Safety, and Health</u>
q-p.	<u>EVM</u>	Earned Value Management
r-q.	<u>FAR</u>	Federal Acquisitions Regulation
s-r.	<u>FITARA</u>	Federal Information Technology Acquisition Reform Act
t-s.	<u>FPD</u>	Federal Project Director
u-t.	<u>FTE</u>	Full Time Equivalent

v . <u>u</u> . <u>G</u>	Guide
w . <u>v</u> . <u>GAO</u>	Government Accountability Office
x . <u>w</u> . <u>GPP</u>	General Plant Project
y . <u>x</u> . <u>HQPM</u>	Headquarters Project Manager
z . <u>y</u> . <u>HVAC</u>	Heating, Ventilation, and Air Conditioning
aa . <u>z</u> . <u>I&C</u>	Instrumentation & Controls
bb . <u>aa</u> . <u>IA</u>	Inter-Agency Agreement
ee . <u>bb</u> . <u>ICE/R</u>	Independent Cost Estimate/Review
dd . <u>cc</u> . <u>IPR</u>	Independent Project Review
ee . <u>dd</u> . <u>IPT</u>	Integrated Project Team
ff . <u>ee</u> . <u>IT</u>	Information Technology
gg . <u>ff</u> . <u>LEED</u>	Leadership in Energy and Environmental Design
hh . <u>gg</u> . <u>M</u>	Million
ii . <u>hh</u> . <u>M&O</u>	Management and Operating Contractor
jj . <u>ii</u> . <u>MCC</u>	Motor Control Center
kk . <u>jj</u> . <u>MEB</u>	Material Energy Balance
ll . <u>kk</u> . <u>MHD</u>	Mechanical Handling Diagram
mm . <u>ll</u> . <u>MNS</u>	Mission Need Statement
nn . <u>mm</u> . <u>MSA</u>	Major System Acquisition
oo . <u>nn</u> . <u>NEPA</u>	National Environmental Policy Act
pp . <u>oo</u> . <u>O</u>	Order
qq . <u>pp</u> . <u>OFPP</u>	Office of Federal Procurement Policy
rr . <u>qq</u> . <u>OMB</u>	Office of Management and Budget
ss . <u>rr</u> . <u>P&ID</u>	Piping and Instrumentation Diagram
tt . <u>ss</u> . <u>PB</u>	Performance Baseline

uu . tt .	<u>PED</u>	Project Engineering and Design
vv . uu .	<u>PEP</u>	Project Execution Plan
ww . vv .	<u>PFD</u>	Process Flow Diagram
xx . ww .	<u>PM</u>	Project Management
yy . xx .	<u>PME</u>	Project Management Executive
yy .	<u>PMO</u>	<u>Project Management Office</u>
zz.	<u>PMRC</u>	Project Management Risk Committee
aaa.	<u>PPBE</u>	Planning, Programming, Budgeting and Evaluation
bbb.	<u>PPEP</u>	Preliminary Project Execution Plan
ccc.	<u>PRD</u>	Program Requirements Document
ddd.	<u>SES</u>	Senior Executive Service
eee.	<u>SIL</u>	Safety Integrity Level
fff.	<u>SIS</u>	Safety Instrumented System
ggg.	<u>SME</u>	Subject Matter Expert
hhh.	<u>SMT</u>	Senior Management Team
iii.	<u>SSC</u>	Structures, Systems, and Components
jjj.	<u>STD</u>	Standard
kkk.	<u>TPC</u>	Total Project Cost
lll.	<u>TRA</u>	Technology Readiness Assessment
mmm.	<u>V&ID</u>	Ventilation and Instrumentation Diagram

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APPENDIX G: REFERENCES

- a. Federal Acquisitions Regulation and Office of Federal Procurement Policy guidance.
- b. Department of Energy (DOE) Acquisition Regulations (DEAR).
- c. Office of Management and Budget (OMB) Circular A-11 for Capital Acquisition Projects and its associated Capital Programming Guide.
- d. DOE Order 413.3B [Chg 7](#), *Program and Project Management for the Acquisition of Capital Assets*, dated ~~1-12-21~~[06-21-23](#).
- e. DOE Guide (G) 413.3-1, *Managing Design and Construction Using Systems Engineering*, dated 10-22-15.
- f. DOE G 413.3-4A, *Technology Readiness Assessments Guide*, dated 10-22-15.
- g. DOE G 413.3-13, *U.S. Department of Energy Acquisition Strategy Guide for Capital Asset Projects*, dated 10-22-15.
- h. DOE G 413.3-15A, *Project Execution Plans*, dated 09-14-18.
- i. DOE G 413.3-17, *Mission Need Statement*, dated 10-22-15.
- j. DOE G 413.3-18A, *Integrated Project Team Guide for Formation and Implementation*, dated 10-22-15.
- k. DOE G 413.3-19, *Staffing Guide for Project Management*, dated 10-22-15.
- l. DOE-STD-1189-2016, *Integration of Safety in the Design Process*, dated 12-22-16.
- m. Government Accountability Office (GAO) Best Practices GAO-20-195G, *Cost Estimating and Assessment Guide*, dated 03-12-20.
- n. NNSA Policy (NAP) 130.~~4A~~[1C](#), *Planning, Programming, Budgeting, and Evaluation (PPBE) Process*, dated ~~12-09-19~~[07-18-23](#).
- o. NAP 413.3A, *Responsibilities for Independent Cost Estimates*, dated 04-30-21.
- p. NAP 413.4, *Technology Readiness Assessment*, dated 12-22-16.
- q. NNSA ~~Business Operating Procedure (BOP)~~[Supplemental Directive \(SD\)](#) 413.~~43~~[43-1](#), *Project Reviews*, dated ~~11-05-14~~[10-21](#).
- r. NNSA ~~BOP-SD~~ 413.~~23~~[23-4](#), *Program Requirements Document* ~~for Construction Projects~~, dated ~~02-09-15~~[08-21](#).
- s. NNSA ~~BOP-SD~~ 413.~~63~~[63-3](#), *Analysis of Alternatives*, dated ~~03-06-14~~[23-216](#).
- t. NNSA ~~BOP-SD~~ 413.~~83~~[83-6](#), *Energy Systems Acquisition Advisory Board Equivalent*

(ESAAB-E) Process, dated 093-3002-16.