

July 2010

Capital and Major Construction Projects Critical Decision Review and Approval

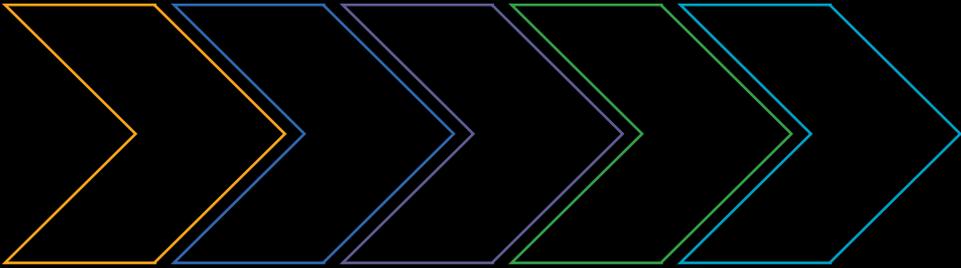
Key Questions for Critical Decision Approval



Standard Review Plan Handbook



Environmental Management
Safety ■ Performance ■ Cleanup ■ Closure



Overview

This Handbook is designed as a practical tool for the Office of Environmental Management (EM) Federal Project Directors (FPDs), Integrated Project Teams (IPTs), Technical Authority Board (TAB), and senior management to ensure that issues and risks that could challenge the success of EM projects are identified early and proactively addressed. The project lessons learned to date, both successes and setbacks, have highlighted the need for a more focused, technically rigorous, and standardized approach to project reviews performed at Critical Decision (CD) points.

The Handbook provides an abbreviated summary of corporate expectations provided in the EM Standard Review Plan (SRP). The SRP is the EM strategic mission-focused framework to formalize EM's institutional processes and requirements associated with the review of capital projects as part of the CD review and approval process.

The SRP is a working document developed in a series of individual Review Modules, which address key functional areas of Project Management, Engineering and Design, Nuclear and Facility Safety, Worker Safety, Environment, Security, and Quality Assurance, grouped per each specific CD point. The technical foundation for the SRP encompasses key milestones established by the DOE O 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, DOE-STD-1189-2008, *Integration of Safety into the Design Process*, and EM's internal business management practices.

The Handbook presents a listing of key issues and questions that need to be considered by the Acquisition Executive, TAB, EM Headquarters Senior Management, and Field Managers, to assure a technically objective and defensible basis for CD approval. The issues and questions are presented for each CD phase. There are also two tables depicting CD prerequisite activities and key documents that provide the basis to address the issues and questions listed.

The SRP complements the TAB framework and assists the FPDs and their IPTs in identifying and evaluating potential significant project management, engineering, technical, and safety issues early in and throughout the project in preparation for CDs. The SRP is developed as a collaborative effort between EM and the Chief of Nuclear Safety, Office of the Under Secretary and can be accessed on the EM webpage at <http://www.em.doe.gov/Pages/Safety.aspx>.



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Table 1

Corporate Applications of Standard Review Plans (SRP)

SRP Product	Main Audience	Application	Value Added
<p>Key Questions for CD Approval</p>	<p>Senior Management</p>	<ul style="list-style-type: none"> ▪ ESAAB Review for CD Approval ▪ EMAAB Review for CD Approval ▪ EM Project Status Review 	<ul style="list-style-type: none"> ▪ Technically objective and defensible basis for Critical Decision approval ▪ Consistent review criteria to ensure DOE and project requirements are met
<p>Review Modules</p> <ul style="list-style-type: none"> ▪ Project Management ▪ Design and Engineering ▪ Safety, Safety and Health ▪ Security ▪ Quality Assurance 	<p>Project Management</p>	<ul style="list-style-type: none"> ▪ Construction Project Review ▪ Design, Safety, QA Review ▪ Federal Project Director and Integrated Project Team Daily Project Oversight 	<ul style="list-style-type: none"> ▪ Standardized Lines of Inquiry to ensure DOE and project requirements are met ▪ Increased likelihood that unforeseen issues/risks are identified earlier and addressed before posing major challenge to project progress and success
<p>Topical Reports</p> <ul style="list-style-type: none"> ▪ Seismic Design Expectation ▪ Technology Readiness Assessment 	<p>Contractor</p>	<ul style="list-style-type: none"> ▪ Day to day project implementation ▪ Contractor self assessment 	<ul style="list-style-type: none"> ▪ Added clarity on DOE project expectations

Key Questions for Critical Decision Review and Approval¹

Performance Status & Verification

CD-0

Approval on Mission Need

Yes**No**

Have **pre-conceptual planning** activities been performed that focus on the program's strategic goals and objectives, safety, environment, security, and design? (all project areas)

Has a **Mission Need Statement** been prepared that documents mission technical and functional requirements, priority, and constraints? (PM)

Have all significant project issues been identified, resolved, and documented? (PM)

Has project reviews been completed, including **Mission Validation Independent Project Review and Construction Project Review**, as directed by EM management? (PM)

If applicable, have the **Information Technology** elements within the Departmental Enterprise Architecture framework been evaluated? (PM)

Have the potential hazards and their safety, security, and risk implications been identified and documented in the **Mission Need Statement**? (NFS, E, S)

¹PM = Project Management, ED =Engineering & Design, NFS = Nuclear Facility Safety, WS = Worker Safety, E = Environmental, S = Security, QA = Quality Assurance.



Key Questions for Critical Decision Review and Approval

Performance Status & Verification

CD-1

Approval on Alternative Selection and Cost Range

Yes

No

Has a **Risk Management Plan** been prepared, and are all project risks identified, analyzed, and determined to be either avoidable or manageable? (all project areas)

Has an **Acquisition Strategy** been completed? (PM)

Has an **Integrated Project Team (IPT)** been chartered and organized, and is it functioning? (PM)

Has the **Federal Project Director (FPD)** been appointed and certified at the correct level? (PM)

Has the preliminary **Project Execution Plan**, including baseline range and documents, been submitted for approval? (PM)

Have **Long-Lead Procurements** been approved, if necessary? (PM)

Does the project comply with **One-for-One Replacement** legislation as mandated in House Report 109-86? (PM)

Is the **Conceptual Design Report** complete after design review by the contractor? (ED)

Has DOE complete the conceptual design review and prepare a **Conceptual Design Review Report**? If it is a nuclear project, has a **Technical Independent Project Review** been conducted to determine if the safety documentation is adequate? (ED, NFS)

Has EM management directed project reviews such as **Construction Project Review, Technical Authority Review, or Technology Readiness Review** to support CD-1 approval? Are the review recommendations being implemented by the project? (all project areas)

Has the **Project Data Sheet** for design been submitted? (ED and PM)

Has the project established a **Code of Record** that contains a set of requirements that are used to design, construct, operate, and decommission a nuclear facility over its lifespan? Has DOE reviewed and approved the Code of Record, and has the contractor placed it under change control (all project areas)

Has a **Safety Design Strategy** been prepared, reviewed and approved by DOE? (NFS)

Has the contractor developed a **Conceptual Safety Design Report (CSDR)** per DOE-STD-1189? (NFS)

Has DOE prepared a **Conceptual Safety Design Validation Report (CSDVR)** on the review of the CSDR? (NFS)

Key Questions for Critical Decision Review and Approval

Performance Status & Verification

CD-1

Approval on Alternative Selection and Cost Range *(Continued)*

Yes

No

Has a **Preliminary Hazard Analysis Report** been prepared, if the project is non-nuclear? (FS and WS)

Has DOE reviewed and approved the **Preliminary Hazard Analysis Report**? (FS and WS)

Has **Integrated Safety Management** process been initiated and documented for the project? (NFS, WS)

Have the **High Performance Sustainable Building** considerations been evaluated and documented? (E)

Have environment documents been prepared, including **National Environmental Policy Act** strategy and analyses, and permit applications? (E)

Has a **Preliminary Security Vulnerability Assessment Report** been prepared? (S)

Has an initial **Cyber Security Plan** been prepared? (E)

Is the site-wide **Quality Assurance Program** acceptable to the project? (QA)

Has an **External Technical Review (ETR)** of technical alternatives and the conceptual design been conducted? (ED)

Has a **Technology Readiness Assessment (TRA)** been conducted? (ED)

Has a **Technology Maturation Plan (TMP)** been developed? (ED)



Key Questions for Critical Decision Review and Approval

Performance Status & Verification

CD-2

Approval on Performance Baseline

Yes

No

Has the project established a **Performance Baseline**? (PM)

Has a Performance Baseline **External Independent Review** been conducted by OECM, including an **Independent Cost Estimate**? Are the Corrective Actions been completed? (all project areas)

Has EM management directed project reviews such as **Construction Project Review, Technical Authority Review, and Technology Readiness Review** to support CD-2 approval? Are the review recommendations being implemented by the project? (all project areas)

Has a **Risk Management Plan** been updated to determine if risks have been identified and properly classified? Are appropriate risk mitigation actions incorporated into the baseline? (all project areas)

Has an **Acquisition Strategy** been updated? Is it consistent with the way the project is being executed? (PM)

Has an **Integrated Project Team (IPT)** been fully staffed and is it functioning properly? Are there any deficiencies in the IPT that could hinder successful execution of the project? (PM)

Is the **Federal Project Director's** level of certification still valid? (PM)

Has the **Project Execution Plan** been updated? (PM)

Have a detailed **Resource-Loaded Schedule** and **Total Project Cost and Project Schedule** been completed? (PM)

Does the **Work Breakdown Structure** represent a reasonable breakdown of the project work scope? (PM)

Has an **Earned Value Management System** been employed and approved? (PM)

Is the **Preliminary Design Report** completed as part of the contractor's **Design Review**? (ED)

Are the **Systems, Functions, and Requirements** documents completed and included in the **Code of Record (COR)** and are in the project baseline, including safety, permits, licenses, and regulatory approvals? (ED)

Has the **Code of Record** been reviewed and approved by DOE?
Has the contractor placed the Code of Record under change control? (all project areas)

Has DOE completed the preliminary design review and prepare a **Preliminary Design Review Report**? (ED)

Key Questions for Critical Decision Review and Approval

Performance Status & Verification

CD-2

**Approval on Performance
Baseline** *(Continued)*

Yes

No

Has the updated **Project Data Sheet** for design been submitted? (PM, ED)

Has a **Safety Design Strategy** been updated, reviewed and approved by DOE for addressing early integration of safety into design? (NFS)

Has the contractor developed a **Preliminary Safety Design Report (PSDR)** per DOE-STD-1189? (NFS)

Has DOE prepared a **Preliminary Safety Validation Report (PSVR)** on the review of the PSDR? (NFS)

Has a **Hazard Analysis Report** been updated, if the project is non-nuclear? (FS and WS)

Has the **Integrated Safety Management** process been continuously implemented?

Has DOE review and approve the **Hazard Analysis Report?** (FS and WS)

Have the **High Performance Sustainable Building** considerations been documented and incorporated into the project? (E)

Have a **National Environmental Policy Act** document and **Record of Decision** been prepared? (E)

Has a **Security Vulnerability Assessment Report** been updated and documented? (S)

Has a **Cyber Security Plan** been updated? (E)

Is the **Quality Assurance Program** been updated for the design phase? (QA)

Has an **External Technical Review (ETR)** of the preliminary design been conducted? (ED)

Has a **Technology Readiness Assessment (TRA)** been conducted? (ED)

Has a **Technology Maturation Plan (TMP)** been implemented (ED)



Key Questions for Critical Decision Review and Approval

Performance Status & Verification

CD-3

Approval on Start of Construction

Yes

No

Has a construction readiness **External Independent Review** been conducted by OECM? Are the Corrective Actions been completed? (all project areas)

Has EM management directed project reviews such as **Construction Project Review, Technical Authority Review, Technology Readiness Review, Construction Readiness and Worker Safety** reviews to support CD-3 approval? Are the review recommendations being implemented by the project? (all project areas)

Has the contractor prepared a **Construction Readiness Plan**? Has EM conducted a **Construction Readiness Review** besides the OECM External Independent Review (EIR)? (all project areas)

Has a **Risk Management Plan** been updated to determine if new risks have been identified in the final design and the risks been properly classified? (all project areas)

Has an **Acquisition Strategy** been updated? Is it consistent with the way the project is being executed? (PM)

Is an **Integrated Project Team (IPT)** fully staffed and functioning properly for the construction phase? Are there any deficiencies in the IPT that could hinder successful construction execution? (PM)

Is the **Federal Project Director's** level of certification still valid? (PM)

Has the **Project Execution Plan** been updated to reflect final design and does it support the way the project and construction effort is being managed? (PM)

Have the detailed **Resource-Loaded Schedule and Total Project Cost and Project Schedule** updated? (PM)

Has an **Earned Value Management System** been continuously employed? (PM)

Is the **Project Transition to Operation Plan** being initiated? (PM)

Is a **Final Design Report** complete and have its contents been reviewed and approved by the contractor? (ED)

Has DOE also completed the final design review and prepare a **Final Design Review Report**? (ED)



Key Questions for Critical Decision Review and Approval

Performance Status & Verification

CD-3

Approval on Start of Construction *(Continued)*

Yes

No

Are the **Systems, Functions, and Requirements** documents completed and have they been added to the Performance Baseline and in the **Code of Record**, including safety, permits, licenses, and regulatory approvals? Are changes from the final design review incorporated into the Performance Baseline? (ED)

Is the **Code of Record** under change control by the contractor? (all project areas)

Has the contractor completed the **Construction Project Safety and Health Plan** prior to CD-3 approval, as required by 10 CFR Part 851? Has DOE reviewed and approved this plan? (WS)

Has a **Checkout, Testing and Commissioning Plan** been initiated prior to CD-3 approval? (ED)

Has the contractor developed a **Preliminary Documented Safety Analysis Report (PDSA)**? (NFS)

Has DOE prepared a **Safety Evaluation Report (SER)** on the review of the PDSA? (NFS)

Has a **Hazard Analysis Report** been updated, if the project is non-nuclear? (FS and WS)

Has DOE reviewed and approved the **Hazard Analysis Report**, if applicable? (FS and WS)

Has **Integrated Safety Management** process been validated for construction activities? (NFS, WS)

Have the **High-Performance Sustainable Building** evaluations been completed, integrated to the design, and documented? (E)

Have **NEPA** documents been completed? (E)

Has a **Security Vulnerability Assessment Report** been updated and documented? (S)

Has the **Cyber Security Plan** been updated? (E)

Is the **Quality Assurance Plan** been modified for construction activities and testing? (QA)

Has an **External Technical Review (ETR)** of the final design been conducted? (ED)

Has a **Technology Readiness Assessment (TRA)** been conducted? (ED)

Has a **Technology Maturation Plan (TMP)** been implemented? (ED)

Key Questions for Critical Decision Review and Approval

Performance Status & Verification

CD-4

Approval on Start of Operations

Yes

No

Have verifications been performed to determine if **Key Performance Parameters** or **Project Completion Criteria** have been met and mission requirements achieved? (PM)

Has a **Checkout, Testing and Commissioning Plan** been completed prior to start of operations? (PM, ED, and NFS)

Has a **Readiness Assessment** or an **Operational Readiness Review** been completed and all pre-start findings been resolved? (PM, ED, and NFS)

Has a **Management Self-Assessment** been performed as part of commissioning and readiness review? (PM)

Has EM management directed additional project reviews such as **Construction Project Review**, **Technical Authority Review**, or **Technology Readiness Review** reviews to support CD-4 approval? Are the review recommendations being implemented by the project? (all project areas)

Is an **Independent Project Team (IPT)** been fully staff and functioning properly for the testing, commissioning, and project readiness phase? Are there any deficiencies in the IPT that could hinder successfully construction execution? (PM)

Is the **Federal Project Director's** level of certification still valid? (PM)

Has the **Construction Project Safety and Health Plan** been updated? (WS)

Has a **Project Transition to Operation Plan** been developed? (all project areas)

Has the **Documented Safety Analysis (DSA)** been finalized and have the **Technical Safety Requirements (TSRs)** been established? (NFS)

Has DOE reviewed and approved the DSA and TSRs and prepared a **Safety Evaluation Report (SER)**? (NFS)

Has the **Hazard Analysis Report** been finalized and have DOE review and approval been obtained prior to operations? (FS and WS)

Are the **NEPA** documents and the **High-Performance Sustainable Building** documents finalized and incorporated into the project's **Environmental Management System**? (E)

Is the **Security Vulnerability Assessment Report** finalized? (S)

Is the **Cyber Security Plan** finalized? (S)

Key Questions for Critical Decision Review and Approval

Performance Status & Verification

CD-4

Approval on Start of Operations *(Continued)*

Yes

No

Has the **Quality Assurance Plan** been updated? (QA)

Has the **Code of Record** been updated and kept under change control by the contractor? (all project areas)



Key Questions for Critical Decision Review and Approval

Performance Status & Verification

Post CD-4 Requirements

Yes

No

Has a **Final Project Closeout Report** been prepared? (PM)

Has a **Lessons-Learned Report** been prepared and submitted to OECM? (PM)

Is all of the **Operational Documentation** completed? (PM)

Has a **Post-Implementation Review** been conducted for **Information Technology** project? (PM)

Are there project policies or procedures to ensure that the **Code of Record** is being kept under change control for operations and eventual decommissioning? (all project areas)



Critical Decision Prerequisite Activities & Key Documents

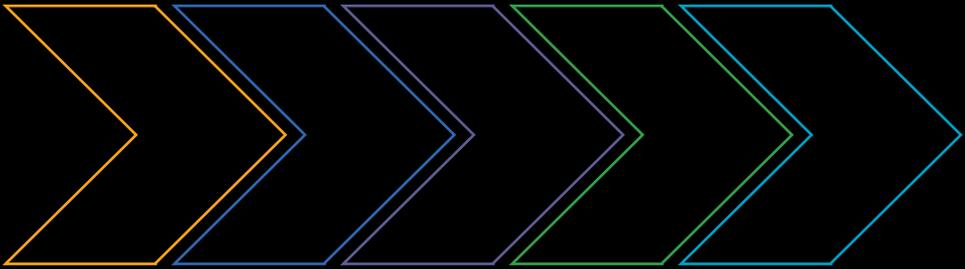
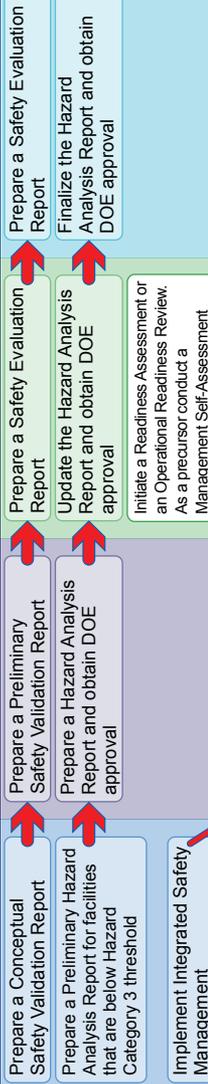


Table 2: Critical Decision Approval Prerequisite Activities

	CD-0 Approval on Mission Need	CD-1 Approval on Alternative	CD-2 Approval on Performance Baseline	CD-3 Approval on Start of Construction	CD-4 Approval on Start of Operations
Project Management	<ul style="list-style-type: none"> Perform Pre-conceptual Planning activities Prepare Mission Need Statement Prepare a Tailoring Strategy if required Perform a Mission Validation Independent Project Review Evaluate projects for Information Technology elements within the Departmental Enterprise Architecture framework 	<ul style="list-style-type: none"> Prepare a preliminary Project Execution Plan Prepare an Acquisition Strategy Comply with the One-for-One Replacement legislation Approve appointment of the Federal Project Director Establish and charter an Integrated Project Team Approve Long-Lead Procurements, if necessary 	<ul style="list-style-type: none"> Update the Project Execution Plan Establish Performance Baseline Employ an Earned Value Management System Perform a Performance Baseline Validation External Independent Review (OECM) or a Performance Baseline Validation Independent Project Review Develop an Independent Cost Estimate or perform an Independent Cost Review for Major System Projects 	<ul style="list-style-type: none"> Update all CD-2 project documentation and required approvals to reflect any changes resulting from final Design, including Project Data Sheet, etc Perform an External Independent Review for Construction or Execution Readiness (OECM) Issue a Project Transition to Operations Plan 	<ul style="list-style-type: none"> Verify Key Performance Parameters or Project Completion Criteria have been met and mission requirements achieved Perform final administrative and financial closeout and prepare a Final Project Closeout Report Prepare a Lessons Learned Report Conduct Post Implementation Review Complete project required Operational Documentation
Engineering and Design	<ul style="list-style-type: none"> Conduct Technical Independent Project Review for Nuclear Projects 	<ul style="list-style-type: none"> Prepare a Project Data Sheet Prepare a Conceptual Design Report Conduct Conceptual Design Review Conduct Technical Independent Review for Nuclear Projects 	<ul style="list-style-type: none"> Update the Project Data Sheet, if applicable Prepare a Preliminary Design Report Conduct a Preliminary Design Review 	<ul style="list-style-type: none"> Initiate a Checkout, Testing, and Commissioning Plan Prepare Final Design Report Conduct Final Design Review Develop Design Code of Record 	<ul style="list-style-type: none"> Complete a Checkout, Testing, and Commissioning Plan
Nuclear and Facility Safety	<ul style="list-style-type: none"> Determine major potential hazards and safety/risk implication 	<ul style="list-style-type: none"> Initiate Code of Record Development Prepare a Safety Design Strategy for projects subject to DOE STD 1189 Prepare a Conceptual Hazard Design Report for Safety Category 1, 2, and 3 nuclear facilities 	<ul style="list-style-type: none"> Update and Control Change to Code of Record Update Safety Design Strategy Prepare a Preliminary Safety Design Report 	<ul style="list-style-type: none"> Update and Control Change to Code of Record Update Safety Design Strategy Prepare the Preliminary Documented Safety Analysis 	<ul style="list-style-type: none"> Update and Control Change to Code of Record Prepare the Documented Safety Analysis with Technical Safety Requirements

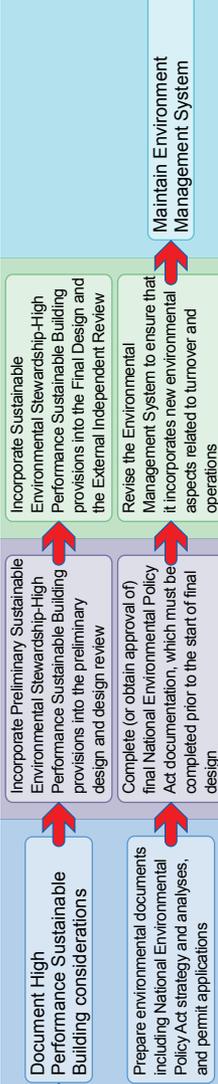
Nuclear and Facility Safety (Continued)



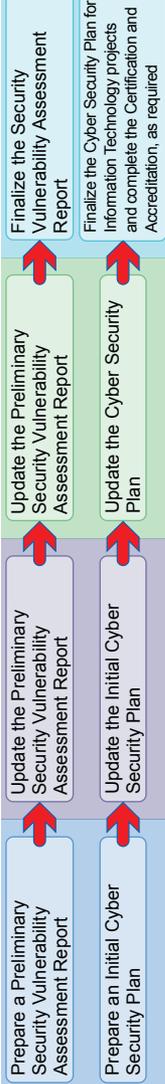
Worker Safety



Environment



Security

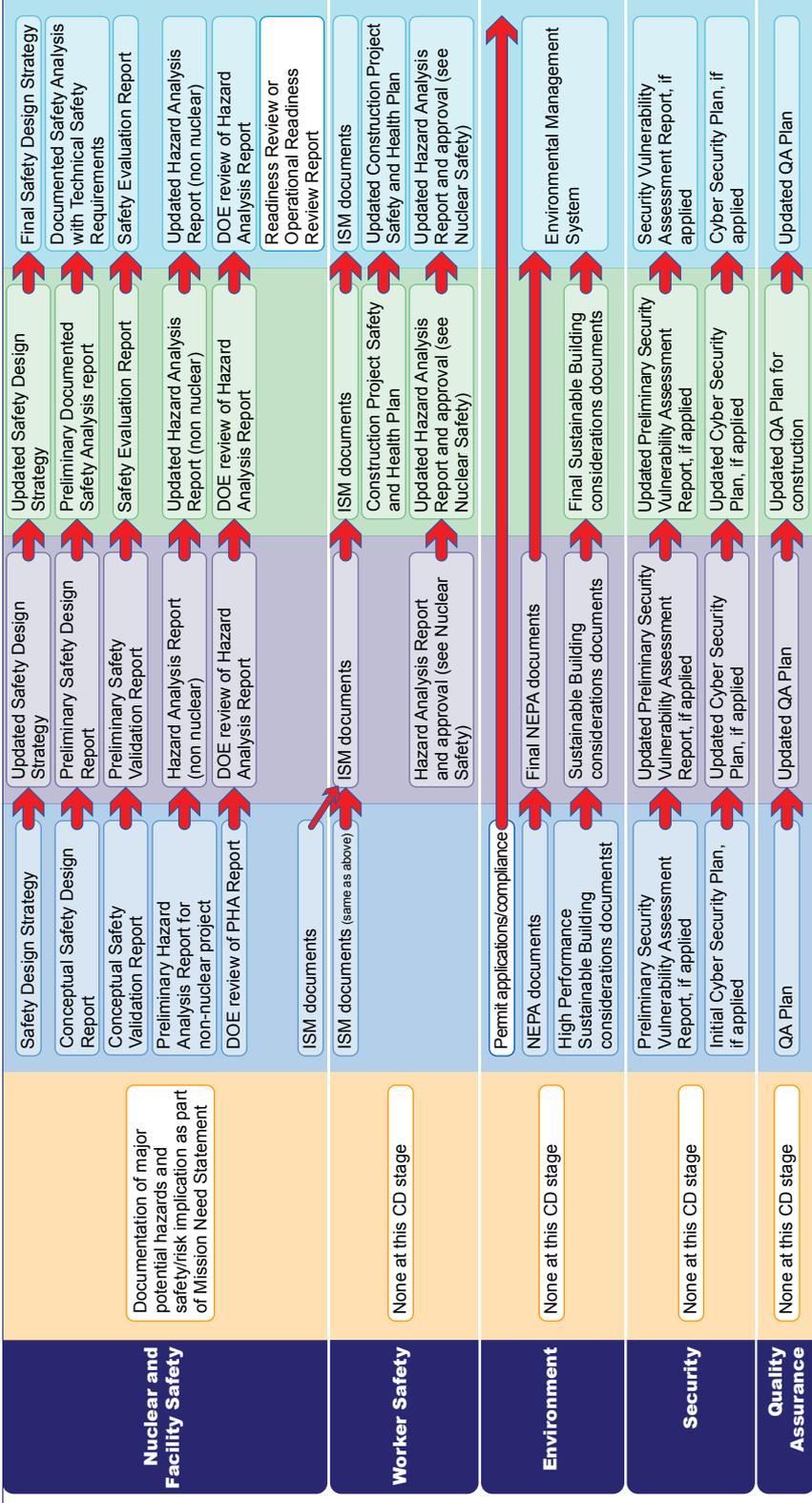


Quality Assurance



Table 3: Critical Decision Approval Key Documents

	CD-0 Approval on Mission Need	CD-1 Approval on Alternative	CD-2 Approval on Performance Baseline	CD-3 Approval on Start of Construction	CD-4 Approval on Start of Operations
Project Management	Mission Need Statement	Project Execution Plan	Updated Project Execution Plan	Updated Project Execution Plan	Documents on verification of Key Performance Parameters or Project Completion Criteria
		Risk Management Plan	Detailed Resource Loaded Schedule	Updated Detailed Resource Loaded Schedule	Project Transition to Operations Plan
		Alternatives Analysis document	Detailed Cost and Schedule Estimates	Updated Risk Management Plan	Final Project Closeout Report
			Updated Risk Management Plan	Updated Risk Management Plan	Lessons Learned Report
Engineering and Design		Acquisition Strategy	Contingency Analysis and Plan	Updated Value Management and Engineering Report	Documents on operations procedures
		Long Lead Procurement documents, if applied	Earned Value Management System documents	Updated Acquisition Strategy	Post Implementation Review report
		Integrated Project Team Charter	Acquisition Strategy/Plan	Updated Funding Profile documents	
			Funding Profile documents	Updated Startup Plan, when appropriate	
			EIR report on Performance Baseline Validation	EIR report on Construction Readiness Review	
		Code of Record	Approved Code of Record	Approved Code of Record	Approved Code of Record
		Technology Readiness Assessment	Drawings, specifications and design lists	Construction planning documents	
		Conceptual Design Report	System Functions and Requirements documents (Design Criteria)	Final Design documents, including drawing and specs	Final Design documents for operations
		Conceptual Design Review Report	Preliminary Design Report	Final design review documents	
		Project Data Sheet for design	Preliminary Design Review documents	Initial Checkout, Testing and Commissioning Plan	Final Checkout, Testing and Commissioning Plan
			Updated Project Data Sheet		



Note: Long-Term plan is to develop a SRP Review Module for each of the key documents and associated activities listed above.

Points of Contact

For additional information or assistance please contact:

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